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Competition in Energy Markets – Note by Colombia

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More documents related to this discussion can be found at
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Ms Federica MAIORANO
[Email: Federica.MAIORANO@oecd.org]

JT03506549

Colombia

1. Introduction

1. In 2021, Colombia ranked 29th out of 115 countries in the Energy Transition Index published by the World Economic Forum, which measures the development of clean energy transition policies (WEF, 2021). Among Latin American countries, Colombia ranked in third place after Uruguay and Costa Rica, evidencing, together with those countries, an essential leadership in the region. This information indicates that transitioning from fossil fuels to clean energy sources is a global task and a core matter regarding Colombia's energy policy. Indeed, the main objective included within document CONPES 4075 of 2022¹, which adopts the Energy Transition Policy, is to consolidate the country's energy transition process by formulating and implementing intersectoral actions and strategies to promote economic, energy, technological, and environmental, and social growth.

2. This document mentions some advances Colombia has experienced in terms of the energy transition. Some of the highlights are the following: **(i)** the diversification of the energy matrix with the entry of power-generation projects with Non-Conventional Renewable Energy Sources (hereafter "**NCREs**"), **(ii)** the implementation of the recommendations of the Energy Transformation Mission to upgrade and improve market efficiency, **(iii)** the development of a regulatory framework that seeks the promotion of new power-generation projects, and **(iv)** the auctions awarding long-term contracts for the integration of renewable power-generation projects.

3. However, the diagnosis that encourages public policy objectives reveals multiple challenges the country faces in strengthening the energy transition. Inefficiency in the use of energy resources, lags in energy coverage, long-term energy security, and reliability, and the lack of strategies to promote technological innovation, among others, are challenges that faces the sector to consolidate this transition.

4. In this context, the Energy Transition Policy in Colombia focuses on four specific objectives: **(i)** Increase the security and reliability of energy supply; **(ii)** improve knowledge and innovation associated with the energy transition in such a way as to promote the deployment of new, more efficient, and cleaner technologies; **(iii)** diversification of economic activities in the energy sector and generate new income sources, business models, and general welfare; and **(iv)** development of an energy system to reduce greenhouse gas emissions (hereafter "**GHG**") reducing environmental impacts.

5. The objectives set out in the Energy Transition Policy require hard work from the country's energy sector regulators. The regulation shall be a tool to promote the technological development of the sector, the efficient use of energy, the participation of different agents in the market, and, mainly, the preferential use of renewable energies. In this sense, consolidating the energy transition process requires a legal framework to develop renewable power-energy markets under competitive conditions. As the OECD recognises, economies flourish when markets are competitive because companies become more efficient and innovative (OECD, 2019). Therefore, establishing clear rules in these

¹ "Energy Transition Policy". CONPES documents are policy instruments through which the National Government establishes guidelines for the country's development in economic and social issues.

markets, reducing entry barriers, guaranteeing equal treatment for agents, and deleting information asymmetries, among other adjustments, would be necessary conditions for competition to accelerate the participation of renewable energies in the country's power-energy matrix.

6. In this scenario, the Superintendence of Industry and Commerce, the Competition Authority in Colombia, displays a decisive role. The vision of this authority regarding the regulatory projects related to NCRE would be fundamental for developing a legal framework that enhances free competition in those markets². Therefore, the competition advocacy role, understood as the possibility of providing an opinion, upon request or ex officio, on government regulation projects that may impact free competition in the markets, is particularly relevant for developing renewable energy markets in Colombia. Moreover, the ex-ante analysis of the regulation enables the possibility of identifying intervention proposals that may be detrimental to the markets, allowing, based on recommendations issued by the Competition Authority, to reduce or avoid the anti-competitive effects that regulation may bring about.

7. Therefore, this contribution aims to show how the Competition Authority's role has strengthened the dynamics of competition within renewable energy markets. It also aims to show how it has helped prevent risks of distortion of these markets due to regulations that go against the principles of free economic competition. To this end, this Superintendence presents its experiences in this market from the preventive approach of competition advocacy. Therefore, the methodology was adopted based on the choice of competition advocacy concepts related to NCRE in which the regulatory authority has accepted the Competition Authority's recommendations³.

8. Finally, and given the previously provided context, this document develops the following parts: first, a brief characterisation of the Colombian electricity market; second, the regulations associated with the generation sources with renewable resources, making emphasis on solar and wind energy; then, the most common competition problems that the Superintendence of Industry and Commerce has identified in the regulatory projects on renewable energies in order to present the analysis and recommendations that have been given to the regulator to address these problems; finally, the conclusions.

2. Electric Market in Colombia

9. In Colombia, diverse actors integrate the electric sector, and they are part of: (i) sectorial policy and state-owned enterprises administration; (ii) regulation, control and surveillance; (iii) policy planning; (iv) electric market; y (v) both private and public investors (CREG, 2011). The electric market contains regulated and non-regulated users (Demand) on the one side and agents (Supply) on the other. According to the *Unidad de Planeación Minero Energética* (hereafter "UPME"), the Demand is increasing on an

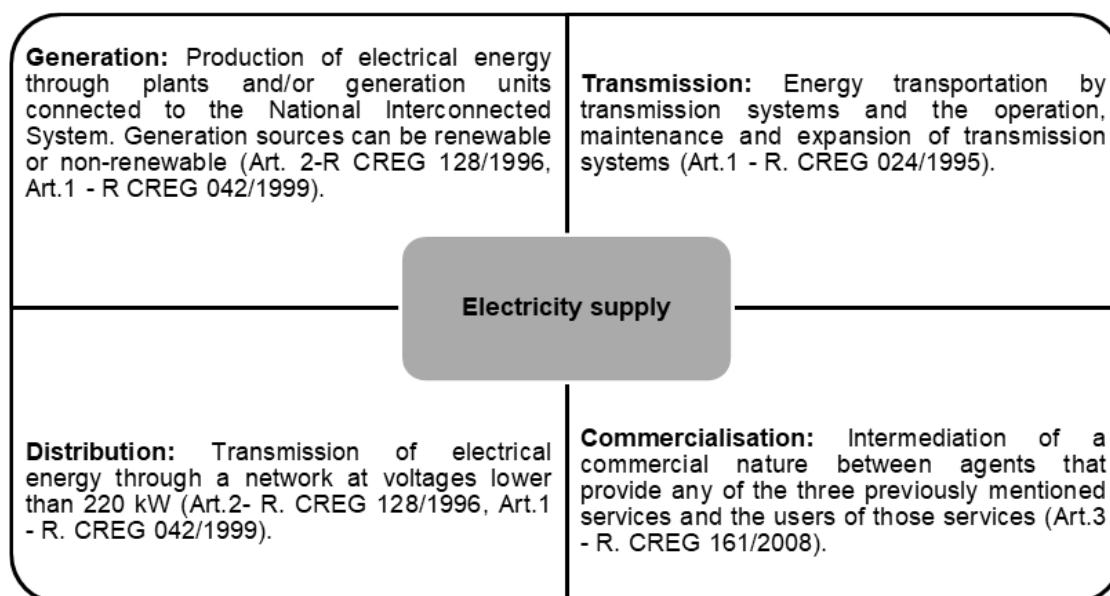
² This definition comes from Colombian law in Article 7 of Law 1340 of 2009.

³ The methodology included the following steps: (i) identification of concepts associated with energy market regulatory projects issued during the period January 2018 to August 2022 (the result was 55 concepts); (ii) of the 55 concepts, 23 concepts had some relation to NCREs and small-scale self-generation; (iii) these 23 concepts were analysed in detail to identify which ones were related, not tangentially, but directly to NCRE; (iv) from the previous exercise, 12 concepts were selected as examples to show the importance of the Competition Authority's recommendations to strengthen the dynamics of free economic competition in renewable energy markets..

annual average by 2% in 2022-2036 under the Mean Scenery⁴ of the Total Electric Energy⁵. This increasing demand situation requires effective responsiveness of the service providers⁶.

10. On the other hand, according to CREG (2022), the agents that are part of Supply are present, at least, in some of the four activities involved in the supply chain of electric energy. These activities are (i) Generation, (ii) Transmission, (iii) Distribution, and (iv) Commercialisation (See Figure 1)⁷.

Figure 1. Supply chain of electric power activities



Source: Superintendence of Industry and Commerce relying on CREG

11. Regarding types and sources of Generation in Colombia, Non-renewable Energy includes ACPM, biogas, coal, fuel oil, and gas. On the other hand, Renewable Energy comprises biomass, wind power, solar power, and hydropower, among others. Renewable Energy generation was approximately 80% of the Total Generation during 2016-2021, and the use of Renewable Energy presented an increasing trend during the mentioned span (XM, 2021a). Figure 2 illustrates this situation.

⁴ According to UPME, the Mean Scenery is a situation that is more likely to occur.

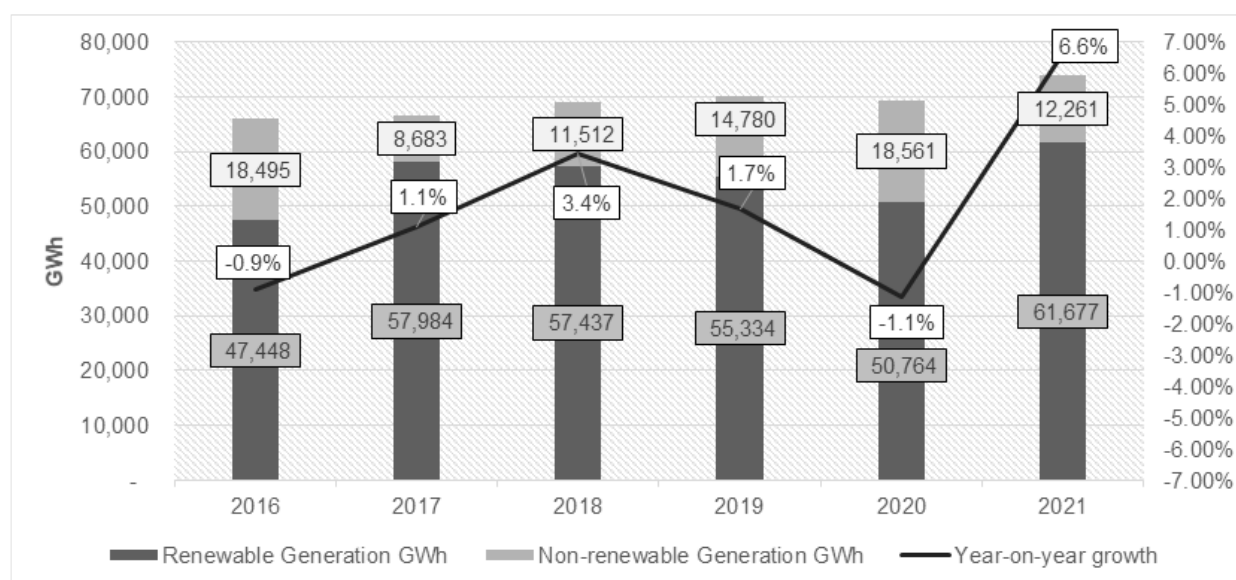
⁵ Total Electric Energy contains the National Interconnected System (NIS), the big consumers, the electric vehicles, and the distributed generation.

⁶ The UPME's projection values in GWh-year are:

2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
77.455	79.995	82.589	85.190	87.060	88.860	90.785	93.396	95.517	97.974	100.450	103.046	105.987	108.904	111.901

⁷ In September 2022, the number of registered agents in the supply chain of electric energy distribution was: 102 in Generation, 16 in Transmission, 38 in Distribution, and 140 in Commercialisation (XM, 2022a).

Figure 2. Evolution of the National Interconnected System generation by generation type for the 2016-2021 period

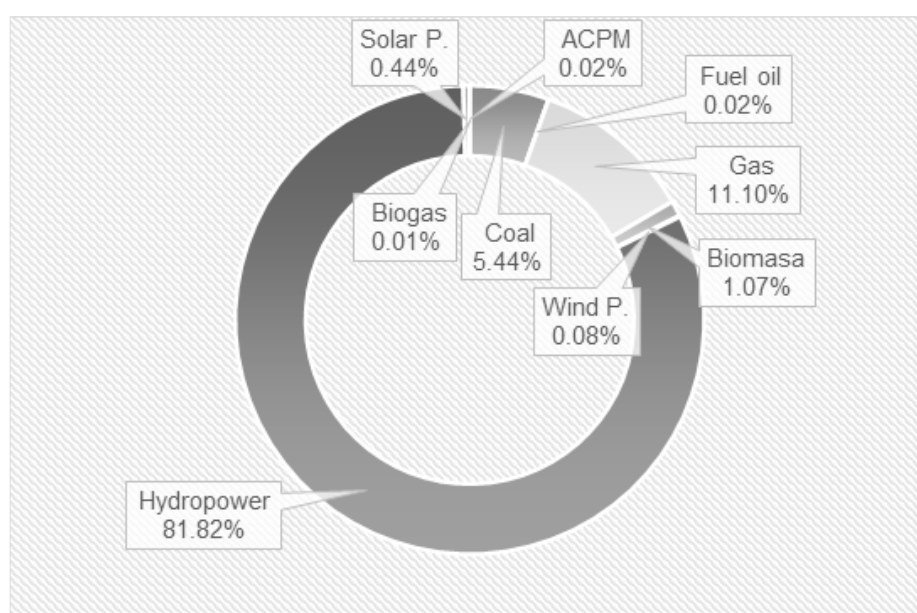


Source: Superintendence of Industry and Commerce relying on XM (2021)

12. On another note, according to the XM Annual Operation and Market Report data, in 2021, hydropower represented 98.09% of Renewable Energy, whilst gas (66.96%) and coal (32.78%) 99.74% of Non-renewable Energy. These shares indicate that hydropower represented 81.82% of Total Generation in 2021, and gas and coal were 11.1% and 5.44%, respectively (See Figure 3) (XM, 2021b). Besides, in line with the actual capacity by type of Generation, the Renewable Energy source share is 68.3% of the energy matrix⁸ (XM, 2022b).

⁸ Following XM, Colombia's total current capacity is 17,816.52 MW in 2022. Hydropower covers 67.2%, solar power 1%, and wind power 0.1%; thermal source represents 3.07% of current capacity. The current capacity remaining is reserved for the co-generator.

Figure 3. Energetic Matrix in September 2022



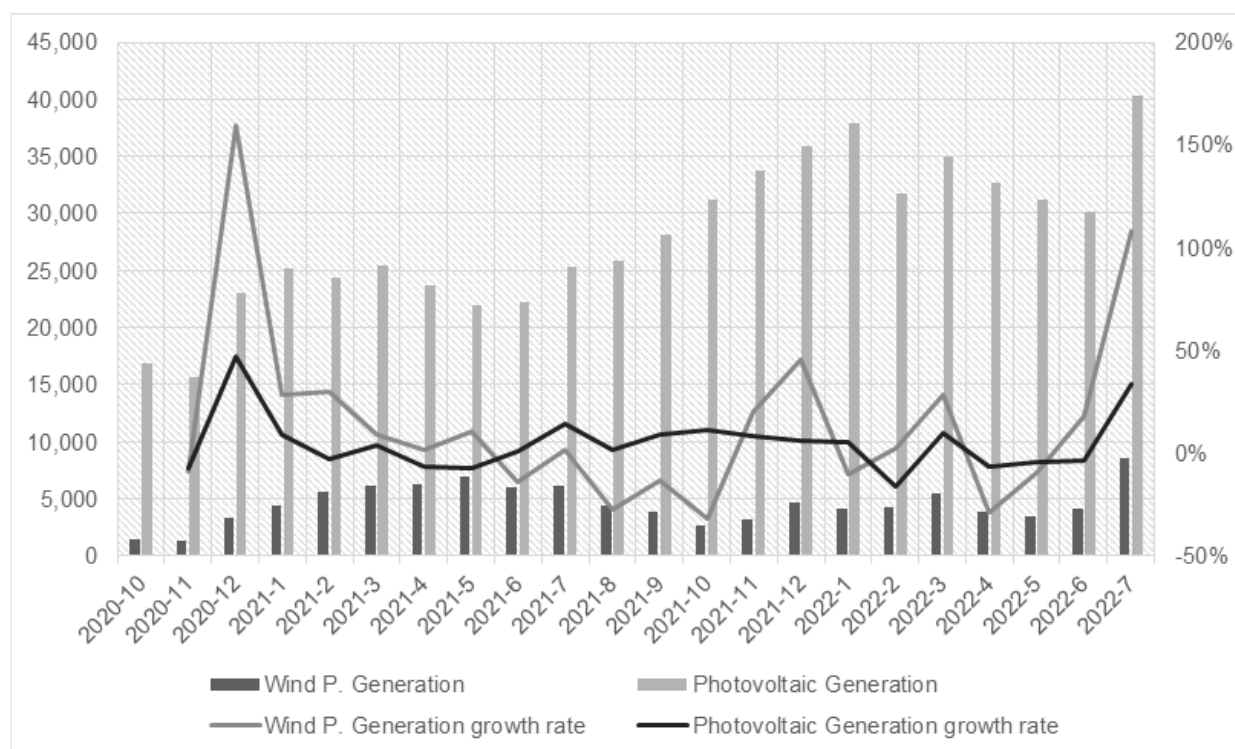
Source: Superintendence of Industry and Commerce relying on XM (2022)

13. However, solar and wind sources accounted for 0.44% and 0.08% of total Generation in 2021, respectively (XM, 2022c), and are part of the NCREs⁹. Regarding this type of source, Figure 4 illustrates that, from February 2021 to July 2022, there has been an oscillating behaviour¹⁰ with an incremental trend from the second quarter of 2022 onwards. In this sense, the monthly growth to July 2022 was 108% and 33% for wind and photovoltaic (solar) generation types, respectively.

⁹ If solar power generation is coming from photovoltaic panels.

¹⁰ The oscillating behaviour does not consider the sudden increase in the NCREs Generation by the end of 2020 and its reduction at the beginning of January 2021.

Figure 4. NCRE Evolution for the 2020-2021 period



Source: Superintendence of Industry and Commerce relying on XM

14. The above, jointly with the growth of renewable generation, besides the energy transition scenario, make NCRE a potential alternative of great relevance for the energy sector. Therefore, due to the importance of these sources, the following section will address the regulations that have explained the development of alternative sources of energy power generation and their incorporation into the Colombian energy matrix.

3. Regulations Related to Renewable Energy Sources

3.1. General regulatory context

15. The Colombian legal framework of non-conventional renewable energy sources has evolved significantly in recent years. The international commitments acquired through the Kyoto Protocol and the Paris Agreement have led to the development of regulations within the country aimed at promoting non-conventional energy sources, mainly those of renewable nature, as well as encouraging investment, research, and development of clean technologies for energy production in the country.

16. In general, the regulation of the energy sector in Colombia is applicable regardless of the energy sources used. However, prior to 2014, the principal sector regulations were mainly oriented towards conventional energy sources. Only from that year, starting with

the issuance of Law 1715 of 2014¹¹, Law 1955 of 2019¹², Law 2099 of 2021¹³ and CONPES 4075 of 2022, a regulatory and public policy framework focused on encouraging the use of renewable sources as a fundamental axis within the country's energy policy was consolidated.

17. However, to comprehensively address the Colombian regulatory context regarding NCREs generation, it is necessary to highlight some regulations prior to Law 1715 of 2014, which, although their main objective is not renewable energy, constitute the regulatory basis of the energy sector in Colombia. These are mainly the Political Constitution of 1991 and Laws 142¹⁴ and 143¹⁵ of 1994. Under the above context, the norms listed in Figure 5 integrate the general regulatory landscape of this sector:

¹¹ “Por medio de la cual se regula la integración de las energías renovables no convencionales al Sistema Energético Nacional”. This is a statutory regulation that regulates the integration of non-conventional renewable energies into the National Energy System.

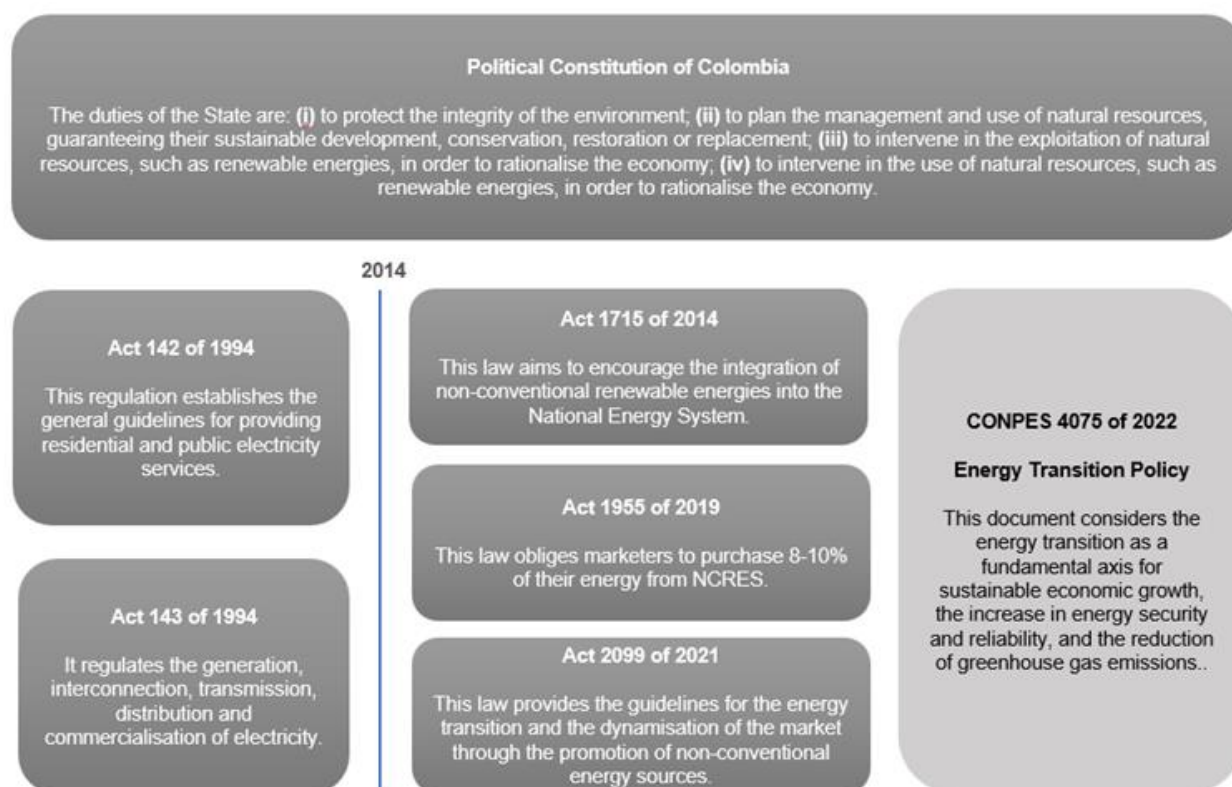
¹² “Por la cual se expide el Plan Nacional de Desarrollo 2018-2022”. This law is the roadmap defined by the government for the period from 2018 to 2022.

¹³ “Por medio de la cual se dictan disposiciones para la transición energética, la dinamización del mercado energético, la reactivación económica del país y se dictan otras disposiciones”. This law regulates aspects related to the energy transition, the dynamisation of the energy market and the economic reactivation of the country.

¹⁴ “Por la cual se establece el régimen de los servicios públicos domiciliarios y se dictan otras disposiciones”. This regulation defines the regime of domestic public utilities.

¹⁵ “Por la cual se establece el régimen para la generación, interconexión, transmisión, distribución y comercialización de electricidad en el territorio nacional, se conceden unas autorizaciones y se dictan otras disposiciones en materia energética”. This regulation defines the regime for generating, interconnection, transmission, distribution, and commercialising electricity.

Figure 5. Regulatory framework



Source: Superintendence of Industry and Commerce

18. The Political Constitution of Colombia, as a roadmap for state policy, defines multiple duties of the State concerning environmental protection and sustainable development. Article 79 establishes that the State must protect the diversity and integrity of the environment, conserve areas of ecological importance and promote education to achieve these goals. Along the same lines, Article 80 states that the State shall plan the management and use of natural resources to guarantee their sustainable development, conservation, restoration, or substitution. Finally, Article 334 states that the State shall intervene in the exploitation of natural resources to achieve, among others, a framework of fiscal sustainability, the improvement of the quality of life, the benefits of development and the preservation of a healthy environment.

19. Law 142 of 1994 defines the general guidelines for providing residential and public utilities of water supply, sewerage, sanitation, electricity, fuel gas distribution and telephony. Although this law does not develop specific parameters for the use of renewable energies, it is a mandatory reference for the National Government when drawing up the intervention policy in the country's energy sector. Moreover, article 2 establishes the need for state intervention in this sector to guarantee free competition and the non-abusive use of the dominant position of the agents that make up this market.

20. Additionally, Law 143 of 1994 entrusts the Ministry of Mines and Energy with the task of defining the criteria for the economical use of conventional and non-conventional energy sources within an integral, efficient, and sustainable management of the country's energy resources. In this context, article 3 of the Law establishes that it is the State's responsibility to (i) promote free competition in the sector's activities, (ii) prevent practices that constitute unfair competition or abuse of dominant position in the market; (iii) regulate

those situations in which, for reasons of natural monopoly, free competition does not guarantee efficient provision in economic terms; (iv) ensure the protection of users' rights and the fulfilment of their duties; (v) ensure the adequate incorporation of environmental aspects in the planning and management of the sector's activities; and, (vi) achieve coverage in electricity services to the different regions and sectors of the country.

21. As previously mentioned, with the issuance of Law 1715 of 2014, the country's energy policy took a significant step forward in regulating NCREs. This law aims to promote the development and use of renewable energy sources, storage systems for such sources and efficient energy use, mainly those of renewable nature, in the national energy system. The above, through their integration into the electricity market, their participation in non-interconnected areas, in the provision of domestic public services, in the provision of public lighting services and other energy uses as a necessary means for sustainable economic development, the reduction of greenhouse gas emissions and the security of energy supply.

22. This law promotes the integration of non-conventional energy sources into the National Energy System for the first time. Among the purposes of this law are: (i) to establish the legal foundations that provide certainty and stability to the sustainable development of non-conventional sources, (ii) to promote investment, research, and development of clean technologies for energy production, and (iii) to determine lines of action for the fulfilment of the commitments assumed by Colombia in terms of renewable energies, efficient energy management and reduction of greenhouse gas emissions.

23. Law 1715 of 2014 was subsequently amended by Law 2099 of 2021, which aims to dictate provisions for the energy transition and the dynamization of the energy market through the use, development, and promotion of non-conventional energy sources. This law declares the promotion and development of non-conventional energy sources to be of public utility and social interest. It also grants various tax incentives for those who invest in these projects' research, production, and development. It also regulates the exploration and research of geothermal resources. Finally, it establishes that the Ministry may encourage the development and research of energy sources that come from organic (animal or vegetable) or renewable sources, intending to issue regulations that include them in the national energy matrix.

24. On the other hand, Law 1955 of 2019 establishes that the commercialising agents of the Wholesale Energy Market are obliged to ensure that between 8 and 10% of their energy purchases come from non-conventional renewable energy sources. This obligation aims to promote a complementary, resilient energy matrix committed to reducing carbon emissions.

25. Finally, in 2022, CONPES Document 4075 was published, adopting the Energy Transition Policy in Colombia. The objective of this policy was to consolidate the energy transition process by formulating and implementing intersectoral actions and strategies that promote the country's economic, energy, technological, environmental, and social growth. This document points out that although Colombia depends economically and energetically on resources such as coal and hydrocarbons, it also has great potential in renewable energies such as wind, solar, and geothermal.

3.2. A review of regulatory framework for wind energy and solar energy

3.2.1. Wind energy

26. Article 20 of Law 1715 of 2014 established that the National Government must promote wind resources in generation projects in isolated or interconnected areas. To this

end, it defines that the Ministry of Mines and Energy must determine the technical and quality requirements to be met by facilities that use wind resources as a generation source. Likewise, CONPES 4075 of 2022 states that the General Maritime Directorate (hereafter "**DIMAR**"), in conjunction with the Ministry of Mines and Energy, will define the rules and implement the mechanism that will allow the allocation of maritime areas for the development of offshore wind energy projects, indicating that this action will run from 2023 to 2025.

27. Under the above context, Resolution 40284 of 2022¹⁶ was issued, which aims to establish the rules, requirements, and minimum conditions of the competitive process through which the rounds of granting of the Temporary Occupancy Permission on Colombian maritime areas for the development of Offshore Wind Energy Generation Projects.

3.2.2. *Solar energy*

28. Law 1715 of 2014 establishes that the National Government must promote the use of solar energy in municipal or district urbanisation projects, official buildings, and the industrial, residential, and commercial sectors. It also states that it must regulate the conditions for the participation of solar energy as a source of distributed generation, establishing the technical and quality regulations to be met by installations that use solar energy, connection requirements, surplus delivery mechanisms, and safety standards for installations. It also establishes that the National Government must encourage the use of photovoltaic generation as a form of self-generation and in distributed generation schemes with NCREs.

4. The Competition Authority and the Identified Problems

29. The Superintendence of Industry and Commerce's contribution has as its starting point the analysis of the acceptance of competition advocacy concepts recommendations on Power Sector-related regulatory proposals. The aim is to show how the Competition Authority has contributed to guaranteeing free economic competition in energy markets.

30. The analysis of regulation harm prevention-based aims to ensure the regulators' measures do not undermine the competitive dynamics of the addressed markets. This task is possible thanks to the OECD's competition assessment tools (OECD, 2019).

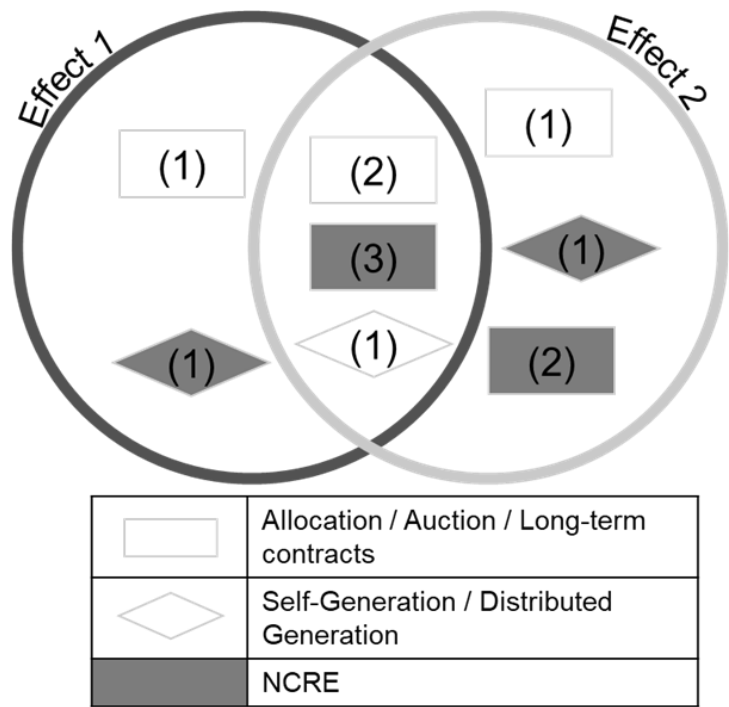
31. According to these guidelines, a regulatory measure can affect competition through four possible effects: **(i)** The first one relates to limiting the number or range of bidders (hereafter "**Effect 1**"); **(ii)** the second one relates to limiting the ability of bidders to compete (hereafter "**Effect 2**"); **(iii)** the third one refers to the reduction in bidders' incentives to compete; and **(iv)** the last one refers to the limits imposed on consumers in terms of the information available and the choices they have to consume (OECD, 2019).

32. With these effects, this Superintendence identified the presence of the first two in the framework of the regulations analysed and related to energy markets, which is a discussed topic in this section.

¹⁶ "Por medio de la cual se define el proceso competitivo para el otorgamiento del Permiso de Ocupación Temporal sobre áreas marítimas, con destino al desarrollo de proyectos de generación de energía eólica costa afuera, se convoca la primera ronda y se dictan otras disposiciones". This regulation establishes the competitive process for granting the Temporary Occupation Permission for offshore areas to develop offshore wind energy generation projects.

33. Meanwhile, concerning the mentioned concepts, the Competition Authority identified 12 documents from which this Superintendence can classify 2 in "Effect 1", 4 in "Effect 2", and 6 in both effects. In addition, in terms of the core topics¹⁷, the Competition Authority establishes that 9 of the 12 concepts are related to the "Allocation / Auction / Long Term Contracts" category, and 3 of the 12 concepts are related to the "Self-Generation / Distributed Generation". Finally, 7 of the 12 concepts are about NCREs. Figure 6 illustrates this description.

Figure 6. Core topics and the identified effects



Source: Superintendence of Industry and Commerce

34. As mentioned above, the following section is divided into two parts. The first part introduces the competition issues that this Superintendence has identified in the search for its contributions with some cross-cutting examples to NCREs. The second part refers to the contributions made by the Competition Authority on wind power and solar power.

¹⁷ This Superintendence classified the concepts under two main thematic axes or core topics. The first one referred to any regulatory project dealing with long-term contract allocation processes, which would include, among others, mechanisms such as auctions, among other aspects. The name of this axis is "Allocation / Auction / Long-term contracts". On the other hand, the second thematic axis refers to the processes of Self-Generation and Distributed Generation, and its name is "Self-Generation / Distributed Generation". Since the relationship with NCREs could be cross-cutting, the Competition Authority identified concepts dealing with regulatory proposals that directly address NCRE.

4.1. The Power Market, the NCREs and their effects on Competition

4.1.1. Effect 1: The restriction on competition for the market

35. The first effect refers to a limit on the number or range of agents, namely, a restriction on the number or variety of firms in one or more relevant related markets¹⁸. This restriction type caused by the regulatory measure may come from the creation of licences, permits or authorisation processes to operate in the market, among other causes. In this case, this effect comes from a regulatory proposal associated with an auction (or the allocation mechanism related to this auction), like the introduction of the long-term contracts' allocation complementary mechanism on which the Competition Authority ruled and issued a competition advocacy concept (See Box 1) (Superintendence of Industry and Commerce, 2019a).

Box 1. Complementary allocation mechanism

Concept identified with file No. 19-198764

The regulatory proposal aimed to implement an additional allocation mechanism to the auction if the regulator's target demand in the auction differs from the amount of energy that is allocated. This mechanism would apply to the wholesale NCRE market.

The analysis of the Superintendence of Industry and Commerce focused on highlighting that the complementary mechanism could go against both the incentives to participate in the auction and the design of the auction. As a result, the recommendations focused on the introduction of objective criteria for the efficient allocation of prices in the framework of the complementary mechanism, as well as on the means of passing on the tariff to end users.

Source: Superintendence of Industry and Commerce

36. As can be seen, the case discussed in Box 1 is one in which the Competition Authority recommends dispensing with the adoption of the discretionary rules that affect the power resource allocation. The underlying relevance of this contribution is twofold. On the one hand, it advocates detached guidelines for the allocation complementary mechanism, so that it does not undermine the incentives to participate and does not lead to change in the voluntary nature of the auction. And on the other hand, it seeks that the design of the allocation mechanism is not detrimental to social welfare, hence the regulatory authority requires a limit on the amount of energy that can be purchased under the complementary mechanism in order not to generate distortions in the incentive scheme that agents have.

4.1.2. Effect 2: The restriction on competition in the market

37. The second effect refers to the limit on the ability of suppliers to compete (OECD, 2019), which refers to the impact on the firm's capability to compete in one or several

¹⁸ This restriction is into the article 1's first question from Resolution 44649/2010: "Por la cual se adopta el cuestionario para la evaluación de la incidencia sobre la libre competencia de los proyectos de actos administrativos expedidos con fines regulatorios, a que hace referencia el artículo 5° del Decreto 2897 de 2010".

relevant related markets¹⁹ [19]. In this regard, multiple scenarios can lead to such an effect, such as any restriction on the distribution, marketing and promotion of products, and differential treatment between firms, among other aspects. This Superintendence brings two examples of cases related to long-term contracting within the wholesale electricity market. This pair belongs to the five-group of issued concepts identified with Effect 2.

38. The first case (see Box 2) illustrates a situation in which this Superintendence analysed two regulatory proposals that distorted the competitive dynamics of the wholesale market for several reasons (Superintendence of Industry and Commerce, 2019b). First, the regulatory initiative established dates for the proposed contracts that left out projects that were already registered but could not participate due to the periodicity of their operation. Second, the rules provided that non-compliance with competition, concentration and dominance thresholds would lead the regulator to resort to an administrative allocation of the contracts. Thirdly, some aspects of the auction were subject to further intervention without further clarification.

Box 2. Long-term power contract

Concept identified with file No. 19-137026

On this occasion, the regulatory authority issued two drafts of a regulatory initiative on long-term power contracts. The first initiative established the general guidelines to implement a complementary and promoting mechanism for the long-term NCREs power contracts in the wholesale market. The second proposal called for a long-term contracting auction.

The analysis of the Superintendence of Industry and Commerce highlighted that the two measures were intended to encourage an effective integration of NCREs into the energy matrix. However, this Superintendence warned about the risks associated with establishing auction guidelines are subject to subsequent regulations. Furthermore, it warned of the consideration of an administrative allocation of contracts because of possible allocative inefficiency.

Accordingly, the Competition Authority developed a series of recommendations. Some of them were aimed at indicating that any measure regulating the auction should favour a competitive allocation model and prioritise such an approach over allocation alternatives.

Source: Superintendence of Industry and Commerce

39. The second case introduced (see Box 3) is about guidelines that promote pro-competitive dynamics within the auction processes for long-term contracts with NCREs (Superintendence of Industry and Commerce, 2021a). In this regard, this Superintendence found that the measures for the competition were symmetrical and biased towards supply so that the development of the market rested on the agents, which could lead to incomplete market development in the NCRE framework. In addition, although the measure ensured the participation of at least three agents and reduced the risk of dominance in the sale, it

¹⁹ This restriction is into the article 1's second question from Resolution 44649/2010: "Por la cual se adopta el cuestionario para la evaluación de la incidencia sobre la libre competencia de los proyectos de actos administrativos expedidos con fines regulatorios, a que hace referencia el artículo 5° del Decreto 2897 de 2010".

did not correct the problem of a sub-optimal equilibrium arising from the interactions between the two groups of agents.

Box 3. Minimal competition guidelines for long-term contracts

Concept identified with file No. 21-373703

The regulatory proposal determined a rule of minimum concurrence of generators in the auction to increase the purchase alternatives for retailer participants in the acquisition of long-term NCRE contracts. The rule consisted of establishing a maximum daily energy offer of 40% so that any energy bidder with participation greater than this threshold could not take part in the allocation mechanism.

In this regard, the Superintendence of Industry and Commerce highlighted that the initiative was in line with previous recommendations about competition guidelines in the auction processes of long-term NCRE contracts. However, it pointed out that the inclusion of competition guidelines was asymmetric to the extent that it only affected generators, but not retailers. For these reasons, the Competition Authority's recommendation sought to promote the competition on both the supply and demand sides.

Source: Superintendence of Industry and Commerce

40. On that basis, several elements sustain the relevance of the two previous cases. Firstly, they are regulatory measures used in long-term contracts to boost the competition dynamics in the wholesale power market. Secondly, they are regulatory initiatives in which the Superintendence's recommendations acceptance encourages the NCRE inclusion within the energy matrix with fewer collateral effects on economic competition. Thirdly, it is important to note that the regulatory initiatives are directly associated with a contract allocation mechanism, on which the Competition Authority has sought to ensure that these proposals meet the conditions that guarantee social welfare as well as economic competition conditions.

41. Finally, the first case of this sub-section established provisions that, in case of non-compliance, would lead to the administrative allocation of such contracts. However, such allocations do not necessarily maximise social welfare (this idea will be developed further in section 4.1.4). Notwithstanding, from the demand side (retailers) there was no guideline that would allow for the concurrence goal of both groups of market agents so that the market equilibrium could be sub-optimal. Therefore, it can be concluded that the Competition Authority's interventions were focused on not generating friction between economic competition and allocative efficiency.

4.1.3. Effect 1 and Effect 2: Constraints on both economic concurrency and competition pressure

42. In the previous two subsections, the Competition Authority has presented some examples with the presence of only one of the effects. This subsection introduces two scenarios (out of the six illustrated in Figure 6) in which both effects were present in the regulatory initiatives. The introduction of guidelines that undermine economic competition gives rise to these situations and alters the market competition dynamics. This is because of the introduction of barriers to entry and the inclusion of asymmetric conditions.

43. The first case (see Box 4) deals with a concept regarding two regulatory projects on long-term electricity contracts (Superintendence of Industry and Commerce, 2018). In general, the objectives of the projects aimed at the agents' concurrence in the framework of the diversification of power generation. However, despite the benefits that would set the tone for other regulatory projects of this nature, the regulatory authority prioritised new projects without any justification. The Competition Authority was alerted since the regulatory initiative not only limited access to the market (Effect 1) but also restricted the type of projects that contracts would consider (Effect 2).

44. The mentioned concept is relevant because it enlightens this Superintendence's role in efficient allocation processes with different terms. The result was the regulation authority accepted the recommendation related to the inclusion of a provision that would generate certainty about the increase in the presence of new-generation projects with the diversification of sources. In addition, this provision should allow free competition between new and existing generation projects.

Box 4. Long-term contracts auction

Concept identified with file No. 18-332125

The Superintendence of Industry and Commerce issues a concept regarding two projects. The first one modifies the long-term power contract mechanism applicable to wholesalers and owners of generation projects. The second one changes the Resolution called the first long-term power contract auction and sets a target demand to be auctioned of a specific amount of MWh/year, besides establishing new generation projects as successful bidders. In general, the modifications were made to the conditions for generators and buyers, as well as to the criteria to be considered based on certain issues such as resilience, resource complementarity, regional energy security and emissions reduction.

In this regard, the Superintendence's analysis focused on the effects of changes that, in general, increased competitive pressure. However, it warned of the regulator's discretion in limiting the auction to a specific type of project. Hence, the guidelines introduced need to allow competition between new and incumbent projects. This would allow for an increase in generation projects and diversification of generation sources.

Source: Superintendence of Industry and Commerce

45. On the other hand, the second case in this sub-section deals with a regulatory proposal that introduced guidelines around small-scale self-generation²⁰ and distributed generation²¹ (See Box 5 (Superintendence of Industry and Commerce, 2021b). On this issue, the Superintendence found multiple problems associated with the competition. Firstly, the commercialisation alternatives were asymmetric to the extent that they were

²⁰ According to Resolution CREG 174 of 2021, small-scale self-generation refers to the process by which electricity is produced to meet, mainly, the own needs of the agents that produce it. The above, when the installed or nominal capacity is equal to or less than the limit established by Resolution UPME 281 of 2015 or any that modifies it, whose value is at one (1) MW.

²¹ In accordance with Resolution CREG 174 of 2021, distributed generation refers to the generation of electricity with a plant installed close to the centres of consumption and connected to the Local Distribution System (LDS), whose installed or nominal generation capacity is less than one (1) MW.

convenient for retailers integrated with the network operator, which could materialise in an advantage for the incumbent firm (Effect 2).

46. Secondly, the guidelines of the regulatory proposal established a limit on the number of generators integrated into the same link point (e.g., a circuit, a transformer, or a substation). Although this was a necessary condition to avoid the transmission capacity saturation by the small-scale self-generator or distributed generator, it was not economically justified by the regulator, and thus constituted a barrier to entry (Effect 1).

Box 5. Small-scale self-generation and distributed generation

Concept identified with file No. 21-64533

The regulatory proposal aimed to introduce modifications, updates and clarifications to the regulation that established the rules and procedures for the integration into the National Interconnected System of Distributed Generation and Small-Scale Self-Generation of power plants. Among the provisions of the Project, the Competition Authority emphasises the integration into the grid of the agents in charge of these types of generation, the conditions for connection and metering, and the rules for power commercialisation.

Concerning regulation, this Superintendence has made a pronouncement on various aspects. One of these is related to the barrier to entry resulting from limiting the number of generators that can be integrated into the same circuit, transformer or substation, which, despite being required, had no basis whatsoever. Another aspect is related to the commercialisation alternatives of the distributed generator, which show benefits from the representation of an incumbent marketer. These alternatives are subject to the type of generation on which the exchange of the surplus with imported energy is allowed if it is NCREF. The previous ideas imply that the remuneration scheme could encourage a distributed generator to choose the incumbent marketer at the expense of the selection of non-integrated marketers.

Source: Superintendence of Industry and Commerce

47. As can be seen, the above examples illustrate situations in which there are multiple effects in the context of NCREs. On the one hand, the first of the cases deals with a pair of regulatory initiatives that, despite not being emphatic in the type of power generation, constitute a relevant precedent on allocation mechanisms for new generation projects that, in accordance with current regulations, would be aimed at NCREs. In this respect, the contribution of this Superintendence lies in the recommendations issued that promote efficient allocation processes without introducing sources of asymmetry among market competitors, which implies preventing Effect 2²².

48. Lastly, in the second case, the regulatory authority regulated the distributed generation and the small-scale self-generation of electricity markets, where the mechanism for acquiring surplus production introduced asymmetry with respect to incumbent marketers, among other elements. Therefore, the contribution of this Superintendence was to foresee the impacts of the commercialisation scheme and to warn, under a harm

²² Effect 1 cannot be avoided, because the initiatives consist of the allocation of long-term contracts, which by definition brings with it the introduction of a limit to competition for the market as soon as the requirements for participation in the auction are not met.

prevention approach, of the need for the establishment of objective rules that promote free competition.

4.1.4. Some reflections on contract allocation mechanisms and Small-scale self-generation and distributed generation

49. This Superintendence has previously dealt with the regulatory contributions in light of the two effects identified. These contributions have been intended for interventions that promote social welfare without distorting the competitive dynamics of the markets²³[23]. However, it is important to warn that this analysis depends on the nature of the regulated markets, which could be subject to endogenous and exogenous ones. Note that rules can introduce exogeneous issues, and this Superintendence has recognised them through concepts like the presented examples in previous subsections.

50. Following the above, this Superintendence will discuss the guidelines associated with the limits on the quantities of NCRE energy purchases. First, according to article 296 of Law 1955 of 2019, retailers in the Wholesale Energy Market must guarantee that between 8% and 10% of their purchases come from NCREs through long-term contracts. Secondly, according to Law 1715 of 2014, if self-generators generate surplus electricity²⁴, it may be delivered to the grid under the terms determined by the CREG. Regarding the latter, Resolution CREG 174 of 2021²⁵ modified, among other things, the conditions for the acquisition of these surpluses, which would be subject to the nature of the source, in such a way that they serve as an incentive so that small-scale self-generators produce power from NCRE²⁶.

51. According to the previous lines, the Law 1955 of 2019 imposed the obligation to acquire a minimum amount of electricity that is purchased for the development of the power market with a more decisive role of NCRE in the generation processes. This provides a basis for the concurrence of generators of this type of source. For its part, the Law 1755 of 2014 and Resolution CREG 174 of 2021 have led to the consideration of a mechanism to limit the amount of energy purchased that is allocated within an auction process, at the risk of not allowing that small-scale self-generators to introduce their surpluses into the grid. As a consequence, the long-term power contracts allocation processes are subject not only to the guidelines on auctions and contract design per se but also to the rules that are introduced in the surplus purchase market.

52. Given this situation, the Competition Authority has been consistent in its pronouncements, especially those that have to do with the implications in terms of efficiency and its transversality with economic competition. Regarding the former, it must be considered that an offer (generation) subject to surplus production creates uncertainty that is only compensated by a production that is destined to generate the surplus quantity.

²³ Except for those interventions that, by nature, reduce competitive pressure, but with a greater social benefit or even with a competition benefit in a different time frame. These interventions are characterised as regulations that, in case they do not materialise, represent higher costs than those generated in terms of competition when they are actually issued.

²⁴ According to article 5 of Law 1715 of 2014, this refers to any energy remaining after consumption that is used to develop the activity of self-generation or cogeneration.

²⁵ This is an administrative act whose Project was reviewed by this Superintendence under file number 21-64533. The Box 5 covered this concept.

²⁶ If these surpluses are of FNCER, they could be exchanged against the import of energy that the agent has imported from the National Interconnected System during the billing period. This is known as an "energy credit", in accordance with article 3 of Resolution CREG 174 of 2021.

Nonetheless, the previous hypothesis is not applicable insofar as self-generation implies a production under the development of the self-generators own needs²⁷. Therefore, guidelines that prioritise these rules would run the risk of producing sub-optimal balances if they are not technically justified by solid reasons.

53. On the other hand, if the regulator establishes guidelines that seek to protect self-generators through regulations that depend on competition parameters (such as dominance, and concentration, among others), it might disincentivise the participation in the long-term contract allocation mechanism if the parameters are not in line with market dynamics. This could affect economic competition and market development of the first link in the power activity chain, which would impact the goals of a greater introduction of NCRE within the energy matrix.

54. In addition, the above is more burdensome since the regulator considered an administrative allocation rule as a substitute mechanism for the auction as long as the competition parameters were not met established by the regulatory authority. This is because the mentioned rule does not necessarily ensure an efficient long-term contract allocation, insofar as, unlike the auction, it does not guarantee a design in which competition dynamics set the prices.

55. In addition to that, the administrative allocation leaves space for subjective evaluation (Maurer & Barroso, 2011). Apart, it could be accompanied by a vague selection process with a possible bias towards incumbent firms (Börger & Dustmann, 2003). Finally, the administrative assignment increases the risk of greater discretion in the allocation process, whose consequences are harmful to the market, apart from the regulatory signal of lack of transparency and objectivity (Maurer & Barroso, 2011), among other issues.

56. On the other hand, interventions in the energy sector related to NCRE that have been analysed by this Superintendence in the framework of Competition Advocacy have brought challenges regarding (i) the type or nature of the regulation instrument and (ii) the intervention alternatives. To illustrate the first challenge, consider the existence of upper limits on the purchase of electricity in auctions and the minimum threshold for the purchase of a particular source, which leads to rethinking the voluntary nature of the auction insofar as, indirectly, buyers must attend to comply with the precepts. To illustrate the second challenge, note the opportunity cost of implementing an administrative allocation mechanism without considering the technical aspects needed, which may have a high social cost since a sub-optimal equilibrium does not maximise social welfare.

57. Consequently, the harm prevention approach has been present in the competition advocacy concepts on NCRE. These documents contain the standing position of the Superintendence of Industry and Commerce regarding to reduce distortions in competition without compromising the regulatory goal. Thus, in the context discussed here, the Competition Authority has been behind the improvement of intervention instruments that have encouraged the development of NCREs intending to guarantee a greater introduction into the energy matrix. This is possible thanks to the recommendation's acceptance degree by regulatory authorities. Accordingly, the following section will discuss specific contributions to wind and solar NCRE.

²⁷ This is in accordance with the provisions of Colombian regulations by virtue of the activity that this agent carries out.

4.2. Experiences of the Competition Authority with wind and solar energy regulation projects

58. Among the opportunities to bring significant benefits to the Colombian energy sector is the development of solar energy projects with photovoltaic solutions and the development of wind projects. The average solar irradiation of 194 W/m² and localised winds with average speeds of 9 m/s are optimal conditions in the country that make solar and wind sources important energy potentials for Colombia (UPME, 2015). In this context, policymakers must respond to this potential through regulatory signals and incentives that favour the penetration of renewable energy in the country. In Colombia, this challenge faced by regulators is nurtured by the competition advocacy function. As will be seen in this section, it has become an instrument to foster the country's competitive development of renewable energy markets.

59. As shown in the previous section, the competition advocacy function serves as a preventive measure, as it seeks to prevent regulation from generating unjustified restrictions to free economic competition. Indeed, through this instrument, the Competition Authority protects the free development of markets and seeks to foster their competitive nature. In this context, the competition advocacy function has played a decisive role in developing the wind and solar energy markets, preventing them from being restricted in their development and consolidation due to regulations with adverse effects on competition.

60. Two recent concepts issued by the Superintendence of Industry and Commerce regarding offshore wind energy and energy service tariffs through individual solar photovoltaic solutions are noteworthy. In both cases, the Competition Authority issued recommendations that were decisive in preventing regulatory measures from generating adverse effects on competition. These cases show that the preventive nature of the competition advocacy function is particularly relevant when applied to regulatory projects aimed at emerging or developing markets.

61. The first case, described in Box 6, presents the analysis developed by the Competition Authority regarding the draft Resolution that sought to define the rules of operation of the competitive process to allocate offshore areas for offshore wind power generation projects in Colombia. The initiative's purpose was to establish a competitive process. However, the competitive nature was at risk due to qualification requirements demanded from the agents to participate in such a process. Therefore, although the regulator's purpose was to promote the concurrence of agents interested in the temporary occupation and subsequent concession of maritime areas, some aspects of the regulatory initiative's content prevented this purpose from materialising.

62. For this reason, the Superintendence of Industry and Commerce analysed the licensing requirements defined in the project. Following this analysis, the regulator recalled the importance of defining these requirements following a prior assessment of the market that includes, among others, the following aspects: (i) the study of the characteristics and conditions of the actors that make up the market, (ii) the limitations that they may encounter given their operating conditions or experience, (iii) the compliance alternatives that the agents would have to achieve an authorisation and, in general, (iv) the panorama that these economic agents would face due to the requirements demanded by the regulator. These reminders intended to ensure that the guidelines introduced by the regulator did not materialise in a generator of Effect 1 discussed in section 4.1.1, referring to the limits of competition for the market.

Box 6. Case of offshore wind power generation

Concept identified with file No. 22-216989

On this occasion, the regulator published a draft resolution that aimed to establish the rules, requirements, and conditions of the competitive process through which the granting of the Temporary Occupation Permission and subsequent Maritime Concession over Colombian maritime areas for the development of offshore wind energy generation projects.

On this occasion, the Superintendence of Industry and Commerce evaluated, among other issues, the possibility that various agents could participate in the competitive process, identifying from comments made by third parties (potential market agents) that their possibility of participating in the process was limited due to the qualification requirements that the regulator intended to demand.

Therefore, the Competition Authority recommended that the regulator evaluate the qualification requirements in detail, considering the market conditions and the effects these requirements could have on the entry of agents to the offshore wind power generation market in Colombia.

The regulator accepted the recommendation, relaxing the qualification and financial requirements to encourage more players to participate in the competitive process.

Source: Superintendence of Industry and Commerce

63. As described in Box 6, the regulator took on board the recommendations made by the Superintendence of Industry and Commerce and relaxed the licensing requirements to ensure greater competition in Colombia's offshore wind energy market. The Competition Authority played a decisive role in this case by preventing the regulator from generating unnecessary entry barriers that risk the market's levels of competition.

64. The second case, described in Box 7, corresponds to a competition advocacy concept regarding a draft Resolution that aimed to define the general tariff formula that determines the remuneration received by public electricity service providers through Individual Solar Photovoltaic Solutions. The competition problem identified in this regulatory initiative consisted of the absence of a robust technical-economic basis to support the methodology defined to establish the tariff formula, which affected the remuneration to be received by the providers of this service. In this regard, the Competition Authority warned that errors in methods for defining remunerations generate suboptimal situations that, consequently, can give rise to allocative inefficiencies that threaten the competition of agents in the market.

Box 7. Solar energy tariff case

Concept identified with file No. 22-220189

The objective of this Project was to define the general tariff formula that would determine the remuneration of public electricity service providers that serve regulated users through Individual Solar Photovoltaic Solutions.

The Superintendence of Industry and Commerce noted the absence of a robust technical and economic rationale to support price regulation, which warned of the potential for the initiative to generate regulatory failures. The absence of a proper basis for the methodology used could affect remuneration and, therefore, the concurrence of agents in the solar energy market.

Therefore, the Competition Authority issued several recommendations to the regulator, among which the following stand out: (i) evaluate the regression models subject to statistical/econometric theory, ensuring that they have the technical value to establish the efficient costs covered by the rule, (ii) establish a minimum frequency for updating the parameters for calculating the cost model.

Once the regulation was issued, this Superintendence observed that the regulator accepted these recommendations in the following sense: (i) The regulator tested the data included in the regressions for heteroskedasticity and normality of the residuals; it also performed tests with different functional forms, seeking the best possible fit between the variables included in the different regressions. These analyses were included as supporting documents accompanying the resolution. (ii) The regulator introduced a minimum required periodicity for updating the tariff calculation parameters.

Source: Superintendence of Industry and Commerce

65. As shown in the case described above, the Competition Authority recognises that price regulation is one of the market's most burdensome intervention mechanisms. Therefore, the regulator must demonstrate that the regulatory measure has a sound technical and economic basis. In other words, in addition to justifying its adoption, it must ensure that it seeks to avoid the least possible distortion in the market. Following the above, the most significant contribution made by the SIC through this concept is the search for rigorousness in the estimation of efficient costs within the framework of the methodology defined for the remuneration of public electricity service providers that serve users through individual photovoltaic solutions.

66. Finally, the cases mentioned in this subsection exemplify the decisive role played by this Superintendence in consolidating the energy market with renewable sources. Undoubtedly, the task entrusted to the regulator to dynamize the energy market through the use, development, and promotion of NCREs is a task in whose execution the Competition Authority has participated based on its analyses and recommendations. Moreover, the development of markets has become a common purpose for which the Superintendence of Industry and Commerce, through its competition advocacy function, contributes to the regulator in the development of regulations that guarantee the lowest level of impact on free economic competition or even aim to increase competitive pressure in the markets. This purpose requires applying a preventive and technical approach that avoids going against the regulatory goal of maximising social welfare.

5. Conclusion

67. Competition advocacy has a harm prevention approach that favours the development of markets under conditions of free economic competition. The ex-ante analysis of regulation allows for mitigating the risks associated with an intervention that unduly restricts the free interaction between suppliers and demanders and promotes regulatory measures that strengthen competitive pressure in the markets. In other words, the competition advocacy function has a double potential: on the one hand, it to identify

the competition problems that would be introduced in the market because of regulation and to issue recommendations aimed at preventing this from happening; and, on the other hand, to identify aspects in which regulation can change to introduce more competitive pressure in the markets.

68. As shown in the previous sections, the Superintendence of Industry and Commerce has made essential contributions to the energy market through its competition advocacy function. This instrument, which translates into a dialogue between the Competition Authority and the regulator prior to the issuance of the regulatory intervention, has been fundamental to strengthening the competitive integration of renewable energies in the Colombian energy market. For example, the preventive nature of this instrument has avoided that, in incipient regulatory contexts -such as wind and solar energy-state-interventions that restrict the competitive development of these markets.

69. The atmospheric conditions of the Colombian territory make wind and solar energy sources potential resources to consolidate the energy transition in Colombia. Therefore, the regulations can be an opportunity to promote dynamics within the energy market that favour the participation of this type of renewable energy in the country. However, given that such regulatory interventions could potentially harm competition, the role of competition advocacy is a tool to avoid affecting this market.

70. The competition advocacy concepts addressed in this paper show the relevance of analysing regulatory initiatives from a perspective that identifies potential market competition risks. As shown in section 4, the cases addressed there corresponded to regulatory measures that hurt competition in the energy market by having both or one of the following effects: (i) limiting the number or range of bidders and (ii) limiting the ability of bidders to compete. In these cases, the Competition Authority issued recommendations that, if accepted, avoided the materialisation of the risks that the regulatory measures posed to economic competition.

71. The recommendations made by the Superintendence of Industry and Commerce in these cases were aimed at the following objectives: (i) to promote objective guidelines for the implementation of complementary allocation mechanisms; (ii) to ensure that the design of allocation mechanisms is not detrimental to social welfare; (iii) to promote the introduction of competitive dynamics in the wholesale electricity market through guidelines on long-term contracts; (iv) include regulatory provisions that generate certainty regarding the increase in the presence of new generation projects with a diversification of sources, fostering conditions of free competition between new and existing generation projects; (v) avoid generating frictions between economic competition and allocative efficiency; (vi) duly support regulatory initiatives that seek to incorporate price regulation, and (vii) avoid the introduction of barriers in the markets that limit the competition of agents.

72. Thus, the contribution that the Competition Authority has made to promote the inclusion of NCREs in the Colombian energy matrix with fewer collateral effects on free economic competition is reflected in the adoption of the regulator's recommendations. Indeed, this beneficial interaction between the regulator and the Competition Authority protects the development of renewable energy markets from potential competition problems caused by regulation and strengthens the dynamics that promote more significant competitive pressure within the Colombian energy market.

73. Following the above, it is possible to conclude that the Competition Authority has actively participated in a task that aims, from a preventive and proactive role, to improve the instruments of intervention in the Colombian energy market and the participation of NCREs in this market. Indeed, the success of this involvement reflects in the

recommendations accepted by the regulator—these result in the implementation of regulatory measures that protect and promote free economic competition in the markets.

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