

From a system of shared payment between generators and customers to a regime of payment of final customers

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SUMMARY

The change in the remuneration system of the transmission system in Chile brought with it the challenge of avoiding double payment of transmission networks, one on the side of the explicit payment of the networks by the end users and another on the implicit payment of these networks via the energy price of the supply contract, both for regulated customers and non-regulated customers. The present work seeks to describe the efforts made by the National Energy Commission (CNE) to avoid the double payment described before.

In Chile, until 2016, the payment of the trunk transmission system was assumed by generators and final customers, in proportion to the "usability" of the transport network. For this, through the factors GGDF (Generalized Generator Distribution Factors) and GLDF (Generalized Load Distribution Factors), an expected use by the users was determined previously, and later, an expected payment of the transmission assets (this was reviewed annually).

The trunk transmission system was differentiated and remunerated in two categories based on "usability". A set of its facilities called Common Influence Area (AIC), was paid by generators and customers by 80% and 20% proportions, respectively. For the remaining facilities of the trunk transmission system, the payment was according to the direction of the energy flows: if the direction was towards the AIC, it was paid by generators, while if the direction was opposite from the AIC it was paid by the customers (according to the time in which the described conditions happened).

The extensive and complicated methodology, which in some cases could have effects contrary to what the regulator pursues, together with a paradigm shift in which transmission is the engine of system development, led to the implementation of a scheme in which the customer fully pays the trunk transmission. It migrated from a payment methodology, which included the differentiated use of the trunk transmission, to one where the assumption is based on the transmission system is the one that allows the development of the generation market, and therefore, the benefits of the greater offer are collected by the end customers.

The change in the transmission remuneration scheme - an issue that has a significant regulatory impact on the market, since it is not a regulatory adjustment but a paradigm shifts in the development of the transmission segment - implies a major challenge for the regulator, whose objective is to transit properly from one scheme to another (the incumbents made long-term decisions based on a different payment scheme to which they are subject at present).

The purpose of this paper is to review the Chilean case of the transition between two completely different schemes. The incentives put in both schemes will be studied, highlighting which elements are relevant in the decision making by the agents. Additionally, it should be noted that the Law allows for a direct exit from the transitory regime by making contract modifications between the parties, in order to discount an amount of the price of energy, and thus this contract (in terms of what is stated in the article) will become part of the permanent regime of the law (100% payment of the transmission by the client).

KEYWORDS

Trunk transmission system, regulatory discussion, double payment, regulatory impact.

I. INTRODUCTION

Until before the modifications introduced by Law No. 20.936 [1] in the D.F.L. No. 4 of the Ministry of Economy, Development and Reconstruction, 2006, which sets the consolidated, coordinated and systematized text of the D.F.L. No. 1 of Mining of 1982, General Law of Electric Services, in Chile, the planning of the trunk transmission system was carried out centrally by the sector regulator (National Energy Commission, hereinafter CNE), and its construction would depend on the nature of the installation required. Thus, if it is a new asset, this implied a public and international bidding process, while, in the case of enhancement project, its execution was sent to its owners. The analysis for the determination of the development and remuneration of the transmission system was carried out within the framework of the so-called Trunk Tariff Processes, in which the following studies are carried out: (i) detection of transmission trunk system expansion; (ii) classification of the trunk transmission system; and, (iii) tariffication of the trunk transmission system.

Regarding the payment system for trunk transmission assets, one of its main characteristics is that it was shared between generators and consumers. Among the various methodologies at a comparative level [3], Chilean legislation opted for a mechanism that required the determination of a Common Influence Area (AIC), which was defined as the set of facilities that maximizes injections with regarding the investment value of them, and, in turn, the

identification of the facilities in the north and south of the system that are connected to the AIC. For its part, the allocation of payments between generators and consumers is made based on the expected allocations of each user, based on the factors called "Generalized Generator Distribution Factor" (GGDF) and "Generalized Load Distribution Factor" (GLDF), to then allocate the payment of 80% of the total of the assets located in the AIC to the total of the generators (calculation that is made by multiplying the GGDF of each generator by the referred figure) and the remaining 20% to The final consumers. The assets that are outside the AIC, they paid in full by the generators in those cases in which the expected flux were going to the AIC direction, while in the other case, was assumed, in full, by consumers. Finally, those generators that had an installed capacity equal to 9 MW and up to less than 20 MW, was eximed of payment, according to a curve where 9 MW implied a complete exemption, and 20 MW the full payment.

On the other hand, the expansion of sub-transmission networks, which, in general, includes assets with voltage levels from 23 kV to 220 kV, were carried out decentralized by their owners, and their pricing was determined through a model company. As regards their remuneration, in most cases it was assigned to final consumers, except in those cases in which the flows of the sub-transmission networks went in the direction to the trunk transmission system, where the generators became participants of the payment.

On the occasion of the modifications incorporated by Law No. 20.936, the name of the trunk and subtransmission transmission segments was replaced by the national and zonal transmission, respectively. In addition, a centralized planning scheme carried out by the regulator it was adopted for both segments, and a remuneration scheme that allocates its payment in full to final consumers. In the case of national transmission, the existing regime at the time of the legal reform imposed the need for the establishment of a transitional regime for the gradual adoption of the new remuneration scheme, which extends from 2019 to 2034. This transition stage implied the progressive decrease of the payment made by the generators of the set of national transmission facilities that were built until 2018, and the correlative increase of said payment by final consumers, through a curve that was built under the assuming that the generating companies implicitly charged the costs of transmission to their customers in the price of energy, and that the contracts that contained such transfers would be ended during the period in which the transitional regime was extended.

Section II of this work will address the description of the legal change introduced by Law No. 20.936, in relation to the treatment of transmission remuneration. Then, section III describes the process of modification and implementation of the transitional regime for the payment of national assets. Finally, section IV will present the main conclusions of the regulatory modification established in Chile.

II. DESCRIPTION OF THE LEGAL CHANGE

Although the legal reform contemplated modifications that would be extended to matters other than those treated in the present work, under the regulation in force until that moment, there was a diagnosis that the payment system for the trunk transmission assets

had been presents problems difficult to solve, in particular, associated with the complexity of the methodology and incentives linked to the expansion of the transmission systems [2].

Thus, for the new actors, the complexity of the calculation methodology established in the Chilean system, and the uncertainty associated with the projection of trunk transmission tolls - product, for example, that the connection of one of them could change the direction of the flow outside the AIC and, with that, the segment that incurre to the payment, supposed a disincentive to investment in the Chilean market. On the other hand, in the case of those generators that were connected outside the AIC, and that they had to pay in full a set of assets, it was not convenient for them to be expanded that assets, because they should pay it. The above implied that, given the preliminary definitions made by the regulator regarding the expansion needs of the trunk transmission system, the actors involved presented various arguments so that such projects were not incorporated into the expansion plan during the discrepancy instance before the Panel of Experts. In those cases, where the requests of the interested parties were successful, the result implied that not all the expansions required in the system were carried out, and therefore, there were no new generators willing to connect to the networks, given the possible risks of congestion, and it implied, indirectly, that there was a lower degree of competition in the generation system, and with it, a greater market power of these with respect to the final customers. Additionally, there were many cases in which the lines that were required in the system, then once the construction of the system began, the communities opposed, implying a delay in the commissioning date of the installation, and moving that risk to the participant agents, who, in the case of the generators, would have a risk of congestion, while, in the case of the final consumers, they could present a risk of supply or increase in their costs.

Given this diagnosis, and anticipating that this scenario would ultimately imply a sustained increase in the prices of electricity that are transferred to regulated customers, is that, with the aim of reducing the prices of supply bids [4], in addition with other modifications, a regulatory change was incorporated for the generators to be exempt from payment, due the clients would fully pay the national and zonal transmission facilities, in the understanding that, greater transparency and traceability of said Payments would collaborate with the stated objective. For the previous purposes, with respect to the national transmission, as established, all assets whose commissioning date be after December 31, 2018, it would paid in full by customers, while the remaining assets would be paid progressively by the clients through a transitory regime, that would transfer the payment of the generators to the clients in a period of time between the years 2019 and 2034. Without prejudice to the transitional period indicated above, an exit mechanism was defined, consisting of the possibility of those generators and customers that had a supply contract signed prior to the entry into force of Law No. 20,936, could negotiate a decrease in the price of the energy destined to deduct from it the implicit component of the transmission cost that was being transferred, which resulted in that client being assimilated, in respect of that contr ato, in the permanent regime of the law, that is, paying in full the costs of national transmission.

III. MODIFICATION AND IMPLEMENTATION PROCESS

a. Design procedure

In general terms, the preparation of the bill that gave rise to the reforms referred to in this document, was subject to a participatory process, which included various stages of dissemination, discussion, observations, and presentations by the ministry of the sector, the regulator, national experts, trade associations, organizations, representatives of the academy and companies of the energy area. In particular, the transitional regime established for the gradual adoption of the transmission remuneration regime was designed, mostly, by the regulator, using the advice of expert consultants in the field and with the participation of the generating companies, based on the information that was required for its construction.

In accordance with the provisions of the previous section, on the occasion of the new transmission remuneration regime, a 15-year transitional regime was established to transfer the entire payment of injection tolls to customers. The transitional period was defined based on the duration of the supply contracts that were taken into account during the analysis, which corresponded to those signed prior to the entry into force of Law No. 20,936, and supplied free and regulated consumption. After its review, it was determined that, on average, the validity of said contracts would expire in approximately around 15 years, what allowed, after said period, the permanent regime was established, due all existing contracts at that date would be subject to the new conditions of remuneration of the transmission and, therefore, would not consider any charge for such concept.

For reasons of simplification, the design of the transitional regime adopted the category of energy suppliers to refer to those agents that would be gradually exempted from the payment of transmission facilities and discarded the alternative of individualizing them through their power plants, even when in the practice are those assets on which payments are calculated. In line with the simplification of the scheme, the gradualness of the exemption considered the grouping of the various suppliers, establishing the application of a single curve of handover of injection tolls.

Likewise, it was defined that the curve referred to in the previous paragraph would start its application in 2019, assigning that year 100% of the payment of injection tolls to the generators. Then, based on the analysis of the supply contracts and their evolution over time, decreasing percentages applicable to the payment of tolls attributable to the generators were defined, which, as they were currently indicated, they represented the aggregate behavior of the contracts and their termination.

In this way, the percentage of payment from which the generators are released must be assumed by the customers. For the purposes of applying the scheme, a distinction was made between so-called individualized clients and non-individualized clients. In general, individualized clients are customers not subject to price regulation, in which the transfer of injection tolls is carried out through different pro-rata defined specifically for each of them, depending on the expiration of their supply contracts. On the other hand, for non-individualized clients (regulated and others not qualified as individualized), a single pro rata was defined, which would increase gradually, and it is assimilated to the permanent regime of the law, in the sense that they suppose a stamped transmission payment.

Regarding the facilities that are sometimes in this transitory payment regime, it is necessary to point out the rule that regulated it expressly indicated that they are considered of certain

facilities affected and belonging to the trunk transmission system as of December 31, 2018. The date recently described is based on the fact that this set of facilities were those that the generators had had the view at the time of signing the supply contracts, either because that assets were built or had their execution mandated, so that their remuneration had been contemplated in the price transferred to the client. In this way, the facilities whose entry into operation we are decreed after the date already mentioned would be paid in full by the final customers¹.

In addition, the transitional regime contemplated the following exemptions: (i) those suppliers that, as a result of comparing the expected generation in a year within the transitory period, with respect to the expected withdrawals at the start date of the transitional period, present a subcontracting, would remain exempt from injection tolls with respect to non-contracted energy, (ii) those suppliers that had unconventional means of generation², they would be exempt from toll payments, transferring it directly to end customers.

Notwithstanding the aforementioned, the transitory article that regulates the transience, contemplates an exit mechanism, which allows, prior agreement between the supplier and the customer, a modification of the respective supply contract is presented to the regulator in order to make a reduction in the price of energy, which must protect the discount of the implicit charges incorporated by way of remuneration of the transmission. If said modification is approved by the regulator, the corresponding supplier is exempt from the payment of injection tolls based on the expected withdrawal of the contract, while the client, in case of being individualized, will become part of the non-individualized clients, with the proportion of assignment of their respective contract, due respect to that contract, the client would be in the permanent regime. It is necessary to point out that, for the purposes of availing themselves of this exit mechanism, there is a two-year deadline once the Law is promulgated.

b. Implementation

Of the transitory mechanism

First of all, it should be noted that, despite being a transitory regulation, the legislative technique used to define the mechanism is rather exhaustive, giving a detailed scope to the norm that was incorporated in Law No. 20.936 to Regulate this matter. In other words, the provision that defines the transition mechanism contains most of the rules and criteria necessary for the application and implementation of the regime, delegating at the regulatory level only the establishment of the methodology for calculating the discounts that should be considered for the case of the exit mechanism.

Notwithstanding the foregoing, although, in its conception, the legal provision regulating the regime was intended to be specific enough to take care of the matters necessary for its

¹ It should also be considered that, the interconnection line that linked the two major systems of the country, and the facilities associated with that interconnection, were directly charged to the final customers, according to the regime governed by Law No. 20.936.

² Up to 9 MW are exempt. Less than 20 MW is considered a curve between 9 MW and 20 MW to determine the exemption.

application, in practice, the analysis performed once the law entered into force, raised the need to define certain concepts and methodologies that were not sufficiently described in the law, or that admitted various interpretations that merited, then, be clarified. In this scenario, the regulator - entity responsible for the implementation of the regime - adopts the decision to request the interpretation the Superintendence of Electricity and Fuels³ about one of the elements that must be used for the determination of injection tolls that will be charged to the suppliers in case of remaining in the transitional regime⁴.

Along with the above, it was necessary to identify the various exemptions associated with the application of the transition regime, understanding as such, facilities, actors or volumes of energy that are exempt from the payment of injection tolls starting from the publication of Law No. 20,936 , which can be classified into the following groups: (i) national transmission infrastructure with an entry date after December 31, 2018; (ii) infrastructure associated with the interconnection of transmission systems; (iii) suppliers that do not have a signed contract before the Law enters into force; (iv) portion of subcontracted suppliers; (v) Unconventional means of generation; and (vi) percentage, in energy terms, of suppliers that are subject to the mechanism of exit of the transitory article. The importance of pointing out these cases lies in the fact that all end customers assume several exemptions, which must assist in their proportional payment of their withdrawals.

The rest of the implementation of the transitional regime is limited to the determination of the payment of tolls made by the Independent Coordinator of the National Electric System annually, where we must consider the application of the decreasing adjustment factors established in the law itself regarding the suppliers, and in turn, those pro-rata determined for the individualized clients that remain in the referred regime. For its part, the calculation of the charges associated with the payment of the exemptions described above must be carried out by the National Energy Commission every six months in the framework of the process of determining rates associated with the remuneration of the transmission, in accordance with the information and background sent by the Independent Coordinator of the National Electric System.

The exit mechanism of the transition regime.

As indicated above, the implementation of the exit mechanism of the transitional regime required the determination, by the National Energy Commission, of a methodology according to which it should calculate the discount applicable to the price of energy agreed in the energy contracts. supply. This methodology was included in a resolution and in an explanatory document that seeks to expose the procedure to qualify for the exit mechanism and the rules for calculating the values associated with the discounts that could be agreed between the parties. Also, the respective modification of the contract must be approved by the National Energy Commission, a requirement that was also contemplated in the transitory provision of Law No. 20.936.

³ In accordance with the provisions of number 34 of article 3 of Law No. 18.410, corresponds to this entity "apply and interpret administratively the legal and regulatory provisions whose compliance it will be necessary to monitor, and give general instructions to companies and entities subject to its inspection"

⁴ The request for a pronouncement was made by the National Energy Commission through communication No. 394, dated July 12, 2018, and the response of the Superintendence of Electricity and Fuels was delivered through communication No. 14.751, of July 13 of 2018.

Thus, in order to determine the possible discount values on the price of energy - which should reflect the transmission costs implicit in the contracts - the Commission made an identification of all supply contracts signed prior to the entry into force of Law No. 20,936, and performed a projection of injection tolls for all generators in the system for the next 15 years. For this simulation exercise, three prospective scenarios were considered, which contained different hypotheses of investment costs of generation technologies, demand, fuel costs, among others. Then, based on the different scenarios, the updated value of injection toll cost per supplier was determined, based on the individual sum of each of them, also considering three possible discount rates to update the flows.

After the previous exercise, and detecting the values that would serve as a parameter for the negotiation of the parties, the interested parties were granted an instance for the approval - or propose an alternative value - of the unilateral or bilateral way, about the modification of their contracts supply contracts with the in order to incorporate in them a reduction of the energy component, which was due to the modification of the transfer of the remuneration costs of the transmission of content in the referred contracts.

In accordance with the established procedure, the proposals made by the interested parties were reviewed by the regulator and contrasted with the estimates of the injection costs indicated above. Based on this comparison, if the proposed value conformed to the parameters already defined, the proposal was approved by the regulator; otherwise, he proposed a different discount, determined based on his calculations. Subsequently, the interested parties had a second instance to rule on the regulator's proposal, accept it or present a second alternative, which would be again evaluated by the Commission, approving it or communicating a new and final discount proposal. If they did not reach an agreement with any of the proposed values, the interested parties could always renounce their interest in taking advantage of the exit mechanism, remaining in the transitory regime, in accordance with the established norms.

c. Participatory work developed and problems detected

Given the complexity of the transitional regime established by Law No. 20.936, during the implementation of the same, and in order to develop the methodology associated with its application, various technical instances were developed in conjunction with the industry, which consisted of an iterative process, where the regulator submit a methodology proposal and the interested parties made their observations. This participatory work was relevant for the design of the transitional regime and for the actors involved, being able to carry out the evaluations regarding the feasibility and convenience of using the exit mechanism.

Regarding the problems detected in the methodological conceptualization of the regime, it is relevant to highlight the difficulty that the required one represented the projection of injection tolls during the transitional period - 15 years - for each of the interested parties require, which had an impact on the determination of the accepted band of values, by the regulator, that could be adopted as a discount on the energy price of each contract. The foregoing is relevant given that, in the regime prior to Law No. 20,936, trunk transmission tolls were calculated with a horizon of one year. The realization of this exercise involved the adoption of certain methodological criteria and scenarios that allow make the simulation that would delivers the required results.

On the other hand, regarding the methodology and writing of the transitory article, one of the relevant aspects was to determine the exemption form of the annual injection tolls and the identification of the generators that could access it, according to the exencion curve of contracts signed by these suppliers.

In addition, given that, in simple terms, the regulatory modification consisted a change from of a shared payment between generators and customers, which it recognized location signals, regarding an exclusive payment of customers, throughout the discussion, for the purpose of conceptualization of the transitional regime, it was detected that some interested parties prefered to maintain said location signal, while others prefer to stamp the transmission tolls pro-rata of their withdrawals, in order to minimize their inyection tolls.

IV. CONCLUSIONS

- i. From the practical experience derived from the implementation of the transitory payment system of transmission facilities, it seems possible to conclude that the application of a transitory regulation with broad implications and of long duration is complex and its derivations are difficult to anticipate during the elaboration and conception of the regime.
- ii. Considering the above, it is difficult to anticipate the behaviors of the different agents involved in the regime, which complicates some of the analyzes associated with the implementation of the mechanism. In particular, it is especially important anticipate free-rider behaviors and individual incentives in the decision-making of the actors.
- iii. Without prejudice to the success in the implementation of the regime described in this document, as regards the fulfillment of the objective of transferring the payment of the transmission facilities, in full, to the final customers, the experience studied could make it advisable to establish regimes more simplified at the legal level and to delegate the determination of rules and criteria of application to instruments of lower normative hierarchy.

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