An Economic Analysis of the Avangrid& PNM Merger

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1. Introduction

Because mergers and acquisitions (M&As)[1] are economic phenomena, a regulatory analysis of mergers must be based on the traditional antitrust analysis of the relevant merger from the perspective of economic theory[2]. Thus, regulators, policy makers, researchers, and/or lawyers can make policy decisions on mergers by taking into account the effect of the relevant merger on public interest. In this context, this report consists of the following sections. First, I will introduce theoretical background for the economic analysis of mergers to better understand and explain how and why mergers become an antitrust issue for regulators/governments/courts. In order to do that, I will explain how, why, and when mergers are problem from the perspective of economic theory and then, construct a linkage between why merger is economically problem and why this economic issue becomes a problem for law. Basically, this leads to an interdisciplinary approach to analyze merger, which is called the law and economic or antitrust analysis of mergers. After building that linkage to better understand why a merger is an interdisciplinary issue for economists, policy makers, and lawyers, I will relate this linkage to the term *'public interest'* since regulators, policy makers, or lawyers need to make a regulatory policy

[1] In this report, the term merger(s) will be used to refer to M&A(s) and the agreement between Avangrid and PNM in order to avoid the controversy between mergers and acquisitions.

[2] City of Albuquerque witness, Dr. Larry Blank, an economist at New Mexico State University and an expert in industrial organization (i.e., the economic discipline addressing mergers), discussed the potential anticompetitive behavior and possible remedies at issue in the Avangrid, Inc.-PNM merger. He stated in his testimony that *"the analysis required in this case is similar to the traditional antitrust analysis of a merger, but the federal and state agencies overseeing this merger are not likely to take into consideration the aggressive path toward a carbon-free electricity market necessitated by the carbon-free objectives of the Renewable Energy Act (REA) amendments of 2019*". (Hearing Exhibit, Direct Testimony of Larry Blank Case No. 20-00222-UT).

In his April 2 testimony prior to the June 4 Stipulation, Attorney General witness Scott Hempling stated that *"Avangrid, Inc.'s very structure -- a combination of monopoly utilities and its renewable energy developer (Avangrid Renewables, LLC – embodies the risks of non-arm's-length relations".*

decision based on public interest. Second, I will introduce antitrust institutional/legal structure in the US to explain when and why mergers are prohibited by the law. Third, based on the aforementioned theoretical background and the legal antitrust structure in the US, I will present the antitrust economic analysis of Avangrid/PNM merger. Fourth, I will discuss the relationship between the economic effects of merger and public interest. The analysis will conclude with policy suggestions for the Commission. The aim is to reveal the antitrust issues related to the Avangrid/PNM and thus, to clarify whether it pursues public interest.

2. The Relationship between Merger and Public Interest

This section will explain the relationship between merger and public interest using the perspective of economic theory. The aim is to introduce a baseline economic model explaining the linkages between the economic effects of merger and public interest for regulation/policy/law makers. The purpose of merger for merging companies is to increase profit for both companies by gaining market share and economies of scale. This happens in two completely different ways: competitive and/or monopolistic market conditions. The difference is that while competitive market conditions cause economic profit, monopolistic market conditions bring about monopolistic rent. Economic profit is desirable because social welfare is maximized in this case. Monopolistic rent is not desirable because only monopoly profit is maximized in this situation. While monopolistic profit maximizes the private interests of self-interested economic agencies, economic profit pursues public interest since social welfare is maximized.

As long as the increased market share and economies of scale gained through merger brings about more efficiency and productivity such as more innovation and research and development (R&D) investments, such mergers are beneficial for the economy and the society since they create more social welfare working in favor of public interest. This effect of merger occurs under competitive market conditions and the mechanism is simple. If there is more innovation and investment in R&D, it is expected that there will be a decrease in production costs leading a decline in price for the final users of that good or service produced by merging companies. It is accepted that such mergers lead to an increase in public interest since the decrease in costs and price due to the innovative activities of merger will give rise to an improvement in consumer welfare. Note that the key component in this analysis is consumer welfare. Accordingly, consumer welfare can be increased by efficiency gains under competitive market

conditions since even merging companies with higher market share can increase profit using such efficiency gains from merger. As long as merger creates more economic efficiency and consumer welfare, it increases public interest.

However, this is also where the problem starts with mergers since both increased market shares and economies of scale might lead to monopoly power for merging companies. In such cases, merging companies might tend to abuse monopoly power rather than using increased market share and economies of scale for more innovative business activities to create efficiency and productivity under competition. Note that in both cases the aim of merging companies is to maximize their profits from merger. However, the problem is that merging companies in the case of innovation-driven merger can make more profit under competitive conditions, which is in favor of consumer welfare since cost and price will decline, while merging companies in the case of monopoly-driven merger will increase their profit under monopolistic market structure, which is not in favor of consumer welfare. In such an economic analysis, consumer welfare is measured by consumer surplus, which is the sum of difference(s) between cost and price of goods/service produced by merger. I can explain this using the simple graphical analysis below. Notation is as follows:

P: Price

Q: Quantity

E: Equilibrium

C: Cost (Supply)

D: Demand

Figure 1. Pre-Merger Market Equilibrium

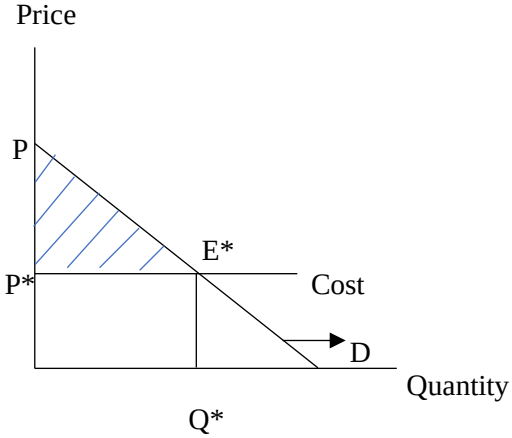
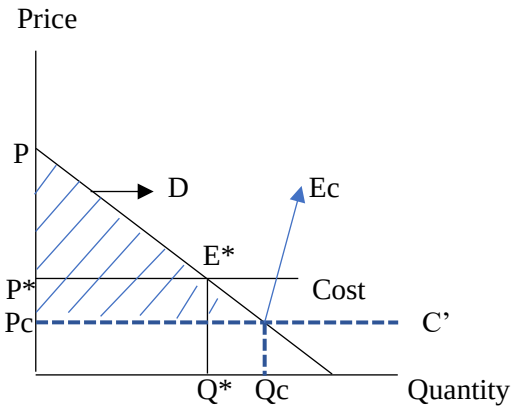


Figure 1 represents the pre-merger competitive market equilibrium at E* where supply represented by C (cost) is equal to D (demand). Accordingly, total consumer surplus is the blue shaded area represented by the triangle of PP*E*. Because consumer surplus/welfare is maximized at the competitive market equilibrium this triangle represents the maximum social welfare. Assume that there is a merger in this market. Figures 2a and 2b represent two different scenarios in the post-merger period.

Figure 2a. Post-Merger Market Competitive Equilibrium



In the scenario depicted by Figure 2a, assume that merging companies use the increased market share and economies of scale to make more investment in innovative activities to compete with other competitors under the competitive market conditions. Because more innovation will reduce production cost, cost curve (C) moves below and the new cost is represented by C' in Figure 2a. Note that the decline in cost will lead to a decrease in price so the new price in the post-merger period will be Pc, which is lower than the pre-merger market equilibrium. Because price is lower now, consumers will demand more and move along their demand curve (D) downward so there will be more supply and consumption as the difference between Q* and Qc at the lower price Pc. The new consumer surplus is the area of PPcEc triangle, which is larger than consumer surplus (PP*E*) in the pre-merger market equilibrium. Note that this merger is considered in favor of public interest since it created more efficiency and productivity because more innovation after merger decreased cost and price so that merger led to more consumer surplus/welfare. Such a merger is acceptable from the perspective of economic theory since merger as an economic phenomenon creates more economic efficiency even if this merger gives rise to an increase in market share(s) for merging companies.

This result also shows the relationship between merger and public interest in an economic activity. It suggests that the economic rationale for public interest in the antitrust law analysis of merger as an economic activity must be based on the gains for the society from merger. In the case of competitive market equilibrium in the post-merger period, there are clearly more gains for the society as the decrease in cost and price, the rise in the quantity consumed as the difference between Q* and Qc, and finally the increase in consumer surplus/welfare. All those gains refer to an increase in public interest. Accordingly, regulators, policy makers, or lawyers should consider such a merger as in favor of public interest and for that reason, this merger should be allowed. As a matter of fact, antitrust institutions in the US approve such mergers as discussed in the next section below.

Figure 2b. Post-Merger Monopolistic Market Equilibrium

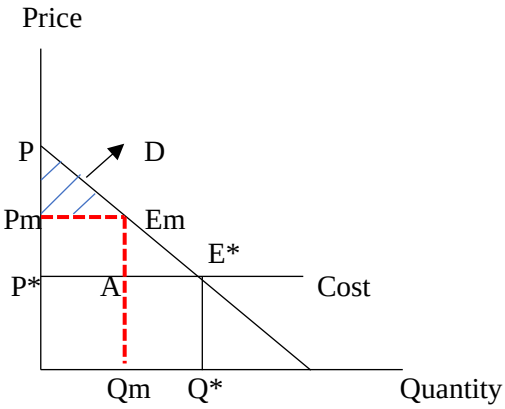


Figure 2b illustrates the monopolistic behavior of merger and its economic effects. If merging companies use the increased market share to dominate the market, they can capture all market share over time and follow monopolistic strategies to eliminate actual and/or potential rivals in the market instead of competing with them. When merger companies have monopoly power, they face the entire demand curve so that they can decide on either the quantity produced or price. In both cases, they most likely charge a price higher than the pre-merger market equilibrium price (P*). The new post-merger monopolistic equilibrium is Em where the new equilibrium price and quantity supplied and demanded are Pm and Qm, respectively.

In the case of monopolistic market structure in the post-merger term, there is only economic inefficiency such as the increase in price, the decrease in quantity, and the decline in consumer surplus. Note that the new price is higher than the price in the pre-merger term and the quantity supplied and

demanded is less than the quantity supplied and demanded in the pre-merger period. Now, consumer surplus/welfare is the area of triangle PPmEm, which is smaller than consumer welfare in the pre-merger period. Moreover, the decrease in consumer surplus is an increase in profit for monopolistic merging companies. In other words, this difference is called welfare transfer from consumers to merging companies. Basically, consumers subsidize monopolistic profit (or rent now) through the increase in price and the decrease in quantity. This is also called the inefficient use of scarce resources by merging companies with monopoly power, which refers to dead-weight loss or the waste of resources for the society since merging companies could use those resources more efficiently by producing more with lower price under competitive market conditions. This is the exact problem with the monopolist behavior of merging companies. There is an absolute decrease in public interest from the monopolistic behavior of merger. Such a merger does not pursue public interest. Accordingly, this merger should be banned by law. As a matter of fact, the US government enacted antitrust laws to fight such mergers, which are not considered in favor of public interest, as discussed in the next section below.

3. Antitrust Merger Analysis in the US

In the antitrust merger analysis, the actual aim of M&As is to gain monopolistic profit[3]. For that reason, the regulatory analysis of M&As is simply the analysis of effect(s) of M&As on market power and anticompetitive market activities for the merging companies. If a merger leads to market power and anticompetitive behavior, this merger is prohibited by law. This is called antitrust law. In the US, as many other countries and European Union, there is a well-structured tradition and understating regarding the antitrust issues stemming from M&As. According to the Federal Trade Commission (FTC)[4], the US antitrust merger policy relies on three legal statutes: The Sherman Antitrust of 1890 Act, The Clayton Antitrust Act of 1914, and the Federal Trade Commission Act of 1914. Governmental antitrust and regulatory agencies are responsible for merger policy including reviewing, suing, and blocking M&As[5].

[3] Bittlingmayer, George. 1985. Did Antitrust Policy Cause the Great Merger Wave?, The Journal of Law & Economics, 28(1), 77-118.

[4] https://www.ftc.gov/tips-advice/competition-guidance/guide-antitrust-laws/antitrust-laws.

[5] Herbert Hovenkamp, "Markets in Merger Analysis." The Antitrust Bulletin, 57(4) (2012), 887-914.

This institutional setting basically outlaws *"monopolization, attempted monopolization, ... or combination to monopolize"* by the Sherman Act and *"unfair methods of competition" and "unfair or deceptive acts or practices"* by the FTC Act. Finally, the Clayton Act bans M&As where their effect *"may be substantially to lessen competition, or to tend to create a monopoly"*. On the other hand, the Merger Guidelines and the Integration of Efficiencies into Antitrust Review of Horizontal Mergers of the Department of Justice in the US clearly states that *"it is efficiency, not competition, that is the ultimate goal if the antitrust laws or efficiency is the goal, competition is the process".* Under this institutional setting, there are two approaches to the antitrust merger analysis. The first approach focuses on market share or monopolization while the second one takes efficiency gains into account. Accordingly, the central issue is the tradeoff between possible efficiency or productivity improvements through innovation arising from a merger and any reduction in competition due to scale of economies or increased market share/power since antitrust merger policy has long relied on a presumption that a merger which considerably increases market share/power is likely to be anti-competitive.

4. The Analysis of the Avangrid & PNM Merger

In this section, using the economic theoretical analysis of mergers introduced above and the institutional structure of antitrust merger analysis in the US, I will analyze the case of Avangrid and PNM merger. The economic analysis of mergers is complicated since a merger comes with its pros and cons to the relevant market. Sometimes, a merger can create a hundred percent market share for the merging companies, but even 100% market share may not lead to market power if there is actual and/or potential competition pressure for the incumbent firm in the market. In addition to that, under this case, if there is efficiency and productivity gains from innovations stemming from the merger, this merger would be considered in favor of public interest even though it gave an absolute 100% market power to the merging companies because there will not be an increase in price. Conversely, price would go down due to innovation-based efficiency and productivity even under 100% market share. On the other hand, in some cases, mergers may not cause any increase in market share for the merging companies but less efficiency, productivity, and innovative market activities leading to an increase in costs and the final price for consumers. In this case, even if there is no increase in market power stemmed from the merger, this merger is not acceptable in economic terms. In some cases, merger gives rise to an increase in market

share, and merging companies (ab)use this increase in market share to dominate the relevant market to make a monopolistic profit/rent. There will not exist efficiency in this case as well. Because merger is an economic issue, the analysis of merger must be based on the perspective of economics, more specifically law and economics.

In the regulated electricity markets, the economic analysis of mergers is way more complicated than any other markets since the effect of regulation in the market must be included into the analysis of merger. For instance, in order to assess market power created by merger, one needs to understand which assets are controlled by each firm[6]. Or, if one of the merging companies such as NMP has already monopoly power in the market and prices are subject to a strict regulation such as rate of return regulation and the other merging company such as Avangrid has strong market power in certain energy resources to generate electricity, a possible long-term contractual relationship between the merging companies can create a perfect monopoly even though such a merger does not lead to a significant increase in market share for the merging companies since the elimination of competition due to such contracts between the merging companies in regulated electricity markets will give rise to monopolistic market structure in the wholesale and/or retail segments in the long run.

New Mexico electricity market is strongly regulated under vertically integrated utility (PNM) and rate of return regulation. PNM controls generation, transmission, and distribution segments. However, there are still competitive components in the market. For instance, the transmission and wholesale facilities are open to third-part access under competitive market conditions even though PNM still has monopoly power over those market activities. Another competitive component in this strongly regulated, vertically integrated, and monopolistic market is the diversity in primary energy resources in generation segment. Renewable energy market was reformed in 2007 to increase the share of renewable energy resources in electricity generation, to reduce the dependence on coal, and to decrease electricity prices. As a matter of fact, the renewable energy reform has not brough about only the diversity and security of primary energy sources in electricity generation but also competition in the generation segment of

[6] Carlton, Dennis W. (2010); 'Mergers in Regulated Industries: Electricity', in *Competition Law and Economics*, edited by Abel M. Mateus and Teresa Moreira, Edward Elgar, Chapter 9, 125-137.

electricity market. While the share of renewables in electricity generation in New Mexico 7% in 2007, it became over 50% as of April 2022, as illustrated in Figure 5 below.

Taking into consideration the aforementioned components of antitrust merger analysis and the features of New Mexico electricity market, we can classify the potential antirust-related issues with this merger as:

1. The effects of the merger on renewable energy contracts between Avangrid affiliates and PNM,
2. Monopolization in generation segment,
3. The adverse effects of rate of return regulation,
4. The expansion of monopolization in generation to wholesale, transmission, and distribution segments.

All those issues that will possibly be led by the Avangrid and PNM merger will be explained step by step. First of all, it is reasonable to classify the potential antitrust issues of the merger as above since Avangrid made it clear in its different statements that there are three main aims for Avangrid from this merger:

1. To dominate the renewable energy market in New Mexico[7],
2. To use PNM's monopoly power in transmission and wholesale markets for electricity it generates from only renewables[8],

[7] In his testimony, Blazquez states that "*For Avangrid, this is a strategic transaction that creates a significant regulated utility and renewable energy platform. Avangrid has already made significant renewable energy investments in New Mexico and believes that the Proposed Transaction will allow New Mexico to consider new efficient integrated alternatives for replacing aging fossil generation with renewable alternatives. Avangrid foresees excellent growth opportunities in the Southwest, including New Mexico. Additionally, New Mexico's commitment to clean energy and climate change aligns with Avangrid's and Iberdrola's core values.*"

[8] AVANGRID CEO Dennis Arriola states that "*This merger between AVANGRID and PNM Resources is a strategic fit and helps us further our growth in both clean energy distribution and transmission*," (https://www.businesswire.com/news/home/20201021005299/en/AVANGRID-and-PNM-Resources-Announce-Merger-Plans).

3. To make inefficient capital investments to take advantage of rate of return regulation[9].

4.1. Issues in Renewables and Generation

The main antitrust issue with this merger is whether it will lead to monopoly power for merging companies in the New Mexico renewable energy market since the monopolization in renewables will help Avangrid dominate electricity generation first, and then the other components of the entire electricity market such as wholesale, transmission, distribution, and retail. Note that the New Mexico electricity market is vertically integrated and strictly regulated. If Avangrid affiliates dominate generation segment, Avangrid will basically become vertically integrated monopoly with almost 100% market share under regulation. This means that there will not be competition for Avangrid affiliates in any segment of electricity market and Avangrid will continue making profit under rate of return regulation with no competitive pressure because the final price of electricity PNM provides to consumers is based on rate of return regulation. Currently, the most important component of competitive gains for consumers in the New Mexico electricity market stems from competition in generation segment and diversity in the primary energy sources. As of October, 2022, there are 45 total power plants generating electricity from Biomass, Coal, Geothermal, Hydro, Natural gas, Nuclear, Solar, Wind, and Wood. Figure 4 illustrates electricity generated by primary energy sources in New Mexico between 2001 and 2022[10]. Figure suggests that there is competition among those 45 electricity generators. As a result of

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"Agreement with PNM provides Avangrid an opportunity to expand its renewables business in the Southwest beyond its existing 1.5-gigawatt capacity wind projects in New Mexico and Texas and 200 megawatts of wind and solar capacity in Arizona (https://www.bizjournals.com/albuquerque/news/2021/11/01/nmprc-recommendation-pnm-avangrid-merger.html).

[9] In his testimony, Blazquez states that *"... we see New Mexico as an attractive place to invest.* The similar statement was made by other executive staff, Patricia K. Vincent-Collawn, chairman, president and CEO of PNM Resources: "*Our combined companies provide greater opportunities to invest in the infrastructure and new technologies that will help us navigate our transition to clean energy" (https://dailyenergyinsider.com/featured/27625-green-energy-giant-avangrid-to-acquire-new-mexicos-pnm-resources/).*

[10] Data is extracted from https://www.eia.gov/state/analysis.php?sid=NM.

this competition, dependence on coal-fired plants in has dramatically decreased since 2007. While the amount of electricity generated by renewables has significantly increased, the amount of electricity generated by coal has radically declined. This competition has been stronger in the last two years. Figure 4 depicts that the amount of electricity generated by wind as a primary energy source is higher than the amount of power produced by both coal and natural gas in 2022 for the first time.

Figure 4. Electricity Generation by Primary Energy Sources in New Mexico: 2001-2022

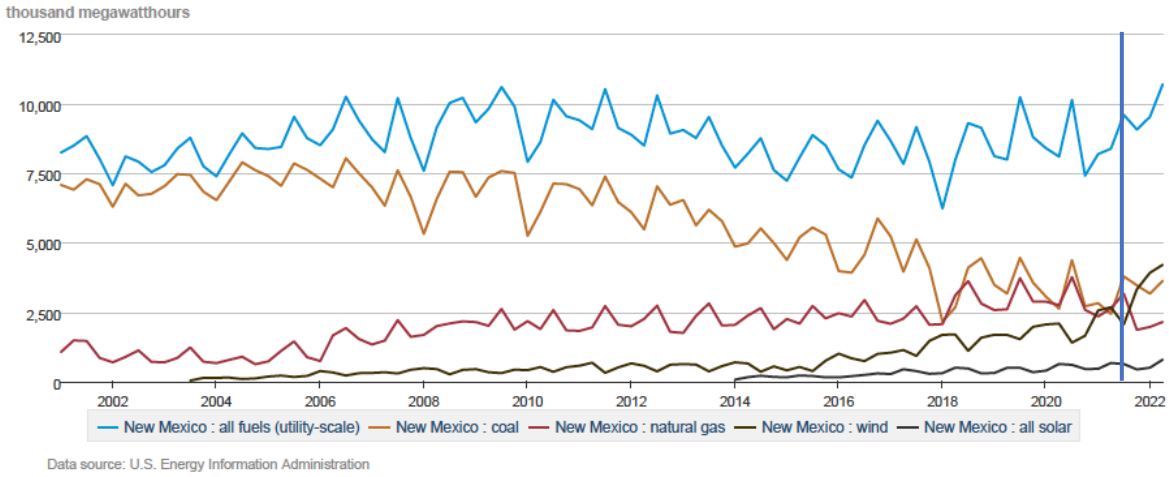
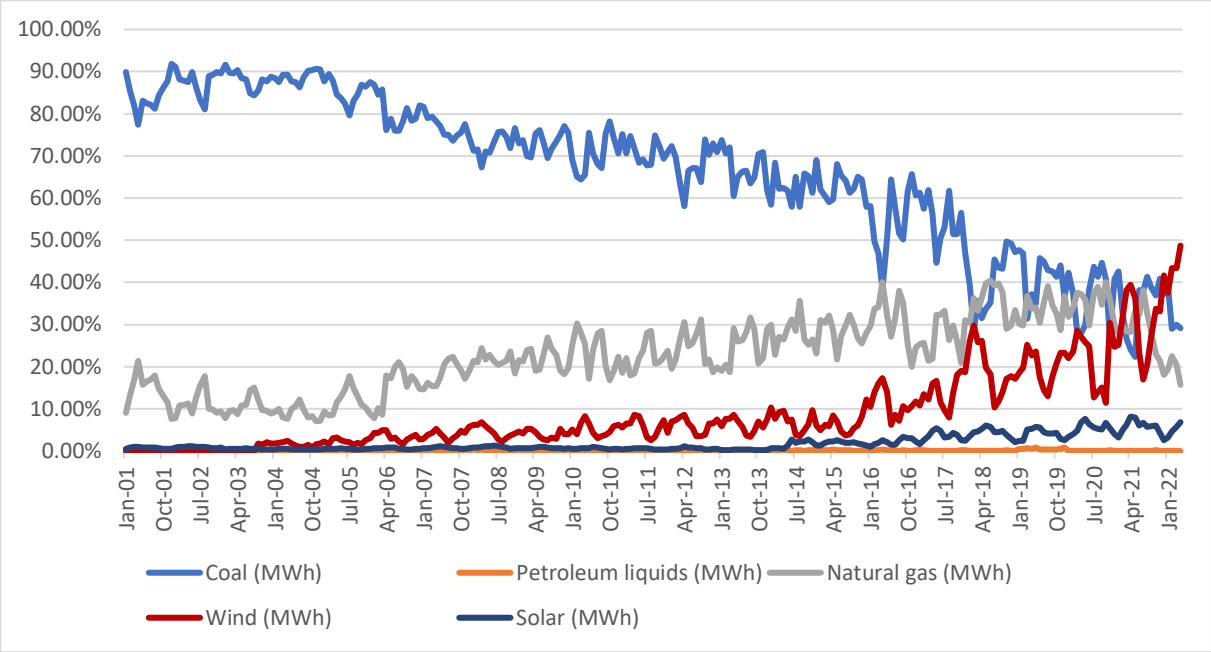


Figure 5 shows the changes in the market shares of renewable energy sources used in electricity generation in New Mexico between 2001 and 2022. Until 2007, the market share of coal-fired plants had been over 80%. After the renewable energy market reform initiated in 2007, the market share of coal-fired power plants dramatically declines from 80% in 2007 to 30% in 2022. On the other hand, the market shares of natural gas, wind, and solar power plants have dramatically risen. In April 2022, the market share of wind is 48%, which is higher than both coal and natural gas. Also, there is a significant increase in the market share of solar power plants from 0.59% in April 2014 to 7% in April 2022. The total market share of renewables is 55% while the total market share of coal and natural gas power plants is 45%.

Figure 5. Market Shares of Primary Energy Sources in Electricity Generation over Time in New Mexico



* Data is extracted from US Energy Information Administration.

** Market shares are calculated by me.

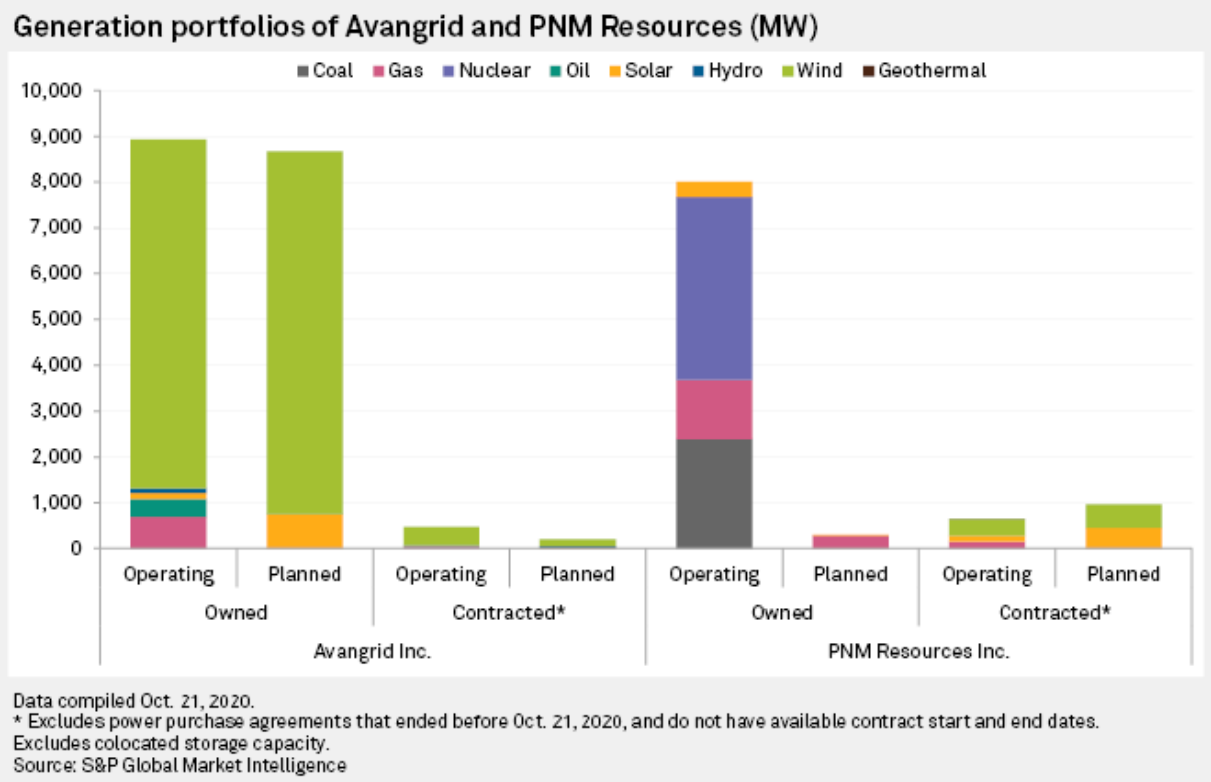
Whereas the above figures illustrate the changes in market conditions, Figure 6 depicts the generation portfolios of Avangrid and PNMR, which is another indicator about the strategy of Avangrid, as of October, 2020. While Avangrid almost completely relies on renewables in electricity generation in its both owned and contracted portfolio, PNM still has some diversity in its owned portfolio. However, PNM does not have its owned operating and/or planned renewable portfolio in its electricity generation. Instead, the renewable portfolio of PNM mostly is from contracted renewables, which is still another indicator for competition. But this also makes the market attractive for Avangrid because PNM will continue making power purchase agreements with developers to meet energy demand in New Mexico and Avangrid is the third largest renewables company with more than 7.5 gigawatts of installed wind and solar capacity in 24 states in the US[11]. For that reason, the merger agreement requires that PNM will

[11] https://www.businesswire.com/news/home/20210127005565/en/AVANGRID-Announces-Expiration-of-Hart-Scott-Rodino-Antitrust-Waiting-Period-For-PNM-Resources-Merger.

https://www.bizjournals.com/albuquerque/news/2021/11/01/nmprc-recommendation-pnm-avangrid-merger.html.

terminate the existing power purchasing agreements with competitor developers[12]. This suggests that Avangrid aims to be the sole/main energy generator for PNM.

Figure 6. Generation Portfolios of Avangrid and PNM Resources



Source: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/avangrid-brings-scale-financial-strength-to-the-table-in-pnm-deal-60850495.

Another factor making the New Mexico electricity market strategic for Avangrid is the renewable energy policies introduced by New Mexico's Energy Transition Act. Accordingly, the Law aims to

[12] "*Avangrid is committed to moving as quickly as possible to the clean generation of power. To that end, the Merger Agreement requires that prior to consummation of the Merger, PNM must execute agreements to divest itself of its ownership interest in the Four Corners Power Plant, and file for the necessary regulatory approvals to abandon that interest. PNM has executed an agreement with the Navajo Transitional Energy Company that will allow PNM to divest its 13% interest in the Four Corners Power Plant in 2024. I understand that PNM is preparing the necessary applications for regulatory approval in a separate proceeding. Joint Applicants are not seeking any approvals in this proceeding with respect to the Four Corners Power Plant.*" (See direct testimony of Pedro Azagra Bazquez).

generate 50%, 80%, and 100% of electricity in 2030, 2040, and 2045, using renewable resources, respectively[13]. All these components make the New Mexico electricity market very attractive for Avangrid. As a matter of fact, as stated by Pedro Azagra Bazquez in this testimony, for Avangrid, this agreement is a strategic transaction that creates a significant regulated utility and renewable energy platform. Note that the CEO of Avangrid makes it clear that this merger provides two strategic gains for Avangrid: regulated utility and renewable energy market[14]. Avangrid will dominate generation segment in the New Mexico electricity market using its monopoly power in renewable energy markets in the US and recover its massive investments in renewables using PNM as a regulated utility under rate of return regulation even if there will be a competitive bidding process in the post-merger period.

When we take into consideration the aforementioned characteristics of the market and the aim of merger for Avangrid, it is most likely to state that Avangrid will make investments in renewables in New Mexico and use PNM and price regulation methodology used by PRC to recover those investment costs. By doing that, Avangrid will make profit over its investment costs in renewable energy market in New Mexico and more importantly this relationship will create monopolistic generation market in the long-term because of increasingly growing dependence between PNM and Avangrid affiliates over time. Note that the market share of renewable energy resources in generation is 55% as of April 2022, as shown in Figure 5 above. Moreover, the Law aims to increase the market share of renewable resources to 100% in 2045. And, the merger agreement requires the termination of PNM's current power

[13] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/avangrid-brings-scale-financial-strength-to-the-table-in-pnm-deal-60850495

[14] For Avangrid, this is a strategic transaction that creates a significant regulated utility and renewable energy platform. Avangrid has already made significant renewable energy investments in New Mexico and believes that the Proposed Transaction will allow New Mexico to consider new efficient integrated alternatives for replacing aging fossil generation with renewable alternatives. Avangrid foresees excellent growth opportunities in the Southwest, including New Mexico. Additionally, New Mexico's commitment to clean energy and climate change aligns with Avangrid's and Iberdrola's core values. Accordingly, we see New Mexico as an attractive place to invest. Direct testimony of Pedro Azagra Blazquez, NMPRC Case no. 20-00022-UT.

purchasing contracts with independent developers. Clearly, those conditions create a perfect opportunity for merging companies to capture a 100% market share in electricity generation.

4.2. Rate of Return Regulation

As stated above, even though there are still 45 renewable energy competitive generators in New Mexico electricity generation market why is Avangrid willing to take a risk to compete with those companies in addition to spending billions of dollars to carry out this merger? According to its business plans, Avangrid will make massive investments in renewable energy market in New Mexico[15]. In order to make profit after spending billions of dollars for the merger itself and making investment in renewable energy facilities with the value of billions of dollars, it is not possible for Avangrid to recover the cost of the merger and this investment expenditures by competing with 45 renewable energy companies. The only way for Avangrid to make profit is the existence of rate of return regulation since Avangrid also made a commitment that *"No PNM affiliate can obtain a new affiliate power purchase agreement ("PPA") with PNM or an extension of an existing affiliate Purchase Power Agreement (including through repowering) without winning a competitive RFP (with an Independent Evaluator) with evidence of direct head-to-head competition with non- Iberdrola or non-Avangrid affiliates, and will be subject to obtaining Commission approval."*[16]

This means that as long as Avangrid renewable affiliates sell their electricity generated by renewable energy sources through PNM to the final users, they will earn a rate of return over their capital costs due to the nature of rate of return regulation. For instance, if we assume there is a 10% rate of return over the cost of capital assets, when PNM purchases electricity from Avangrid affiliates, the regulated final price will recover Avangrid cost over its investments. Note that Avangrid states that they will make

[15] As stated in Direct Testimony of Scott Hempling, "*Avangrid Renewables' business plan includes investment of more than $8 billion between 2021 and 2025, with $3 billion in our offshore wind projects and around $1 billion per year in onshore wind and solar. With these investments, Avangrid expects to add 5.6 GW to reach a total consolidated capacity of 13.2 GW by 2025, including 1.6 GW of offshore wind from the Vineyard Wind and Park City Wind projects. This represents an increase of approximately 74% compared to 2020 figures*".

[16] See Azagra-Blazquez's testimony in the Second Amended Stipulation.

billions of dollars investment in New Mexico in addition to their payment for merger. This is particularly an important indicator that they will use this massive investment to dominate the market since there is competitive bidding process between PNM and electricity generators. Accordingly, the competitor with the lowest generation cost will be the bidding winner and will make power purchasing agreement with PNM. At this point, even if it is possible that other renewable competitors can generate electricity with lower cost than Avangrid renewable affiliates do and PNM needs to make a PPA with those low-cost renewable generators, this does not necessarily mean that PNM will purchase electricity from those low-cost companies. Also, the cost per unit of power Avangrid will generate will most likely be lower than other small competitors' generation costs because of Avangrid's massive investment in capital assets.

For instance, assume that competitors A and B generate electricity with 10 and 20 cent per KWH using wind and solar energy resources, respectively. Also, assume that those generators' investment costs are 100 million dollars. Accordingly, under a 10% rate of return regulation, competitor A will make 1 cent profit per KWH while competitor B will make 2 cent profit per KWH. Roughly, we can assume that competitor A will make 10 million dollars over its total capital cost whereas competitor B makes 20 million dollars over its investment since competitor B has larger electricity generation facility. If we include Avangrid affiliates to this simple model, it is possible to state that even if Avangrid affiliates generate electricity costlier than those two hypothetical competitors, PPA can make PNMs with Avangrid affiliates. For instance, even if we assume that Avangrid affiliates generate electricity with 25 cent per KWH, they would be willing to sell electricity with a lower bid to compete with those two companies and win the bidding process under competition until Avangrid affiliates eliminate the competitors from the market. Also, even if Avangrid affiliates sell electricity with 10 cent per KWH it is possible that Avangrid will make way more profit than those two competitors since Avangrid will make billions of dollars investment in renewable energy market in New Mexico. Accordingly, if we assume Avangrid makes one-billion-dollar investment, they will make a 100-million-dollar profit through 10% rate of return regulation. Actually, as they have declared, they will make multi-billion-dollar investment as the third biggest renewable energy company in the US.

Moreover, it is possible that Avangrid affiliates can generate electricity with a lower cost than their competitors since Avangrid is a specialized company in renewable energy and has the advantage of

economies of scale in electricity generation by renewable energy resources because of massive capital investment in renewables. From the perspective of economic theory, this means that the average cost of electricity Avangrid generates will be decreasing in the long run no matter what. In other words, it is most likely that, using the advantage of its massive capital investments and economies of scale in renewables, Avangrid will even generate electricity with a lower cost than its competitors. This will give a unique advantage to Avangrid to be the winning bidder even under competitive bidding processes. Even if it seems there will be competition between Avangrid and other competitors during bidding processes, it is clear that Avangrid affiliates will eliminate those small competitors from competitive bidding processes in the long run and thus, Avangrid affiliates will be the only electricity generators in New Mexico.

Note that even the profit of Avangrid from such a business strategy does not matter. They will follow such a business strategy to dominate the market. As a matter of fact, after making the first power purchasing agreement with PNM, this will be a long-term contract and such a long-term contractual relationship between Avangrid and PNM will both eliminate the actual competitors form the bidding processes/market and create entry barriers to the market for potential competitors for the future. Note that generation is the only competitive segment in the New Mexico Electricity Market. Transmission, wholesale, and distribution are already under the control of PNM. PNM owns or leases transmission lines, interconnected with other utilities in New Mexico, Texas, Arizona, Colorado, and Utah. After capturing monopoly power in generation, PNM and Avangrid merger will create an absolute monopoly controlling all the segments in the market. Under those conditions, there is an extreme risk that the merging companies will dominate wholesale market as well using PNM's monopolistic power so that they will eliminate third-part access or independent competitors and thus competition completely from wholesale electricity markets in New Mexico. As a matter of fact, this is the real-long-term business strategy for Avangrid from this merger as they made it clear several times[17]. This is an obvious antitrust issue because it is the abuse of market power by merging companies. Such a merger cannot be approved by government authorities because it is prohibited by Antitrust Laws in the US.

[17] See footnote 8.

In addition to the long-term antitrust issues with this merger, when the market is entirely dominated by merging companies, there will be no productive and efficient competitive market activities and electricity generation. Avangrid will just make more massive renewable energy investments and they will get some certain government guaranteed profit through rate of return regulation. This is called the Averch-Johnson effect[18] and one of the very well-known problems of rate of return regulation historically is unproductive and inefficient capital investments. Under such price regulation, the nature of this merger because of the aforementioned relationship between Avangrid and PNM could give rise to a perfect opportunity for the merging companies to engage in such manipulative market activities to increase their earnings or profits over rate of return regulation. Note that once Avangrid eliminates competitors and dominates the market as monopoly, they will make billions of dollars of capital investments in the New Mexico electricity market as expressed in footnote 15 to make more profit. The problem is that this increase in the company earnings or profits is completely inefficient and unproductive and burden on consumers. Because there is no competition in New Mexico electricity market and there is strict regulation, which is also not incentive based price regulation but rate of return regulation, the merging companies can easily manipulate costs and prices using their monopoly power. At least, there is not any institutional or legal impediment to stop the merging companies from such a manipulative market behavior after the merger.

Lastly, in addition to those possible issues, there is no possible efficiency and/or productivity expectations from this merger because the merging companies do not offer to bring any innovative initiative to the New Mexico electricity market through this merger. Actually, one of the main expectations from such big mergers is to bring research and development-based innovation to the market. Through such innovation, it is expected that there will be decrease in costs and final prices since innovation brings about efficiency and productivity for the merging companies. This is particularly crucial and applicable to the traditionally regulated monopolistic companies such as PNM. Moreover, this is more and more important in the case of PNM because PNM is not only traditionally regulated

[18] *Averch*, Harvey; Johnson, Leland L. (1962). "Behavior of the Firm Under Regulatory Constraint". *American Economic Review*. 52 (5): 1052–1069.

monopoly but also regulated by rate of return regulation, which is very well-known regulatory tool to create inefficient and unproductive cost structure for such regulated companies. In this sense, if Avangrid brings innovation to the market we could expect that this merger would lead to some increase in consumer welfare and thus public interest by increasing efficiency and productivity and decreasing costs since such gains would most likely give rise to a remarkable decrease in prices for consumers. Conversely, there is no reason to expect Avangrid will have incentive to bring innovative market activities to PNM because the presence of rate of return regulation does not enable such a possibility.

5. Public Interest in Avangrid-PNM Merger

Using the simple economic model on the potential effects of mergers in Section 2, we can explain if there is public interest in the Avangrid-PNM merger. From this analysis, we know that the most crucial component of a merger from the perspective of antitrust economic analysis of mergers is whether a merger will lead to market power for the merging companies. As a matter of fact, as expressed in Section 3, the US antitrust laws prohibit *"monopolization, attempted monopolization, ... or combination to monopolize"* (the Sherman Act) and "*unfair methods of competition"* and *"unfair or deceptive acts or practices"* (the FTC Act) led by merger. Moreover, even when merger *"may be substantially to lessen competition, or to tend to create a monopoly"*, this merger is ban by the law (The Clayton Act). From the economic analysis of Avangrid&PNM Merger in Section 4, we understand that this merger "may *"may be substantially to lessen competition, or to tend to create a monopoly"* in not only in renewable energy market or generation segment but also in the entire electricity market in New Mexico. It is possible to say that there will be *"monopolization"* or *"attempted monopolization"* through this merger. Because of dominant power of Avangrid affiliates in renewable energy industry in the US but not only in New Mexico, it is possible to state that there will exist *"unfair methods of competition"* and *"unfair or deceptive acts or practices"* in the market in the post-merger period. Note that even when Avangrid affiliates make low price offers in competitive bidding processes to take advantage of rate of return regulation though PNM and/or to eliminate competitors from the bidding process and the market, this will be unfair or deceptive practice and competition, according to the Law.

It is clear that there are antitrust issues with this merger. The problem is that those antitrust issues are related to public interest since once this merger creates monopoly, there will be no reason for merging

companies not to charge monopoly price. Once price is monopolistic, which is Pm in Figure 2b above, there will be decrease in consumer surplus, which is equal to the area of trapezoid represented by $P_mA_mP^*AE^*$. Moreover, while the area, which is represented by $P_mP^*AE_m$, in the decrease in consumer surplus is welfare transfer from electricity users from Avangrid, the remaining part (the area of triangle E_mAE^*) of the decrease in consumer surplus is deadweight loss, which is a total waste of resources because those resources will not be used for the economy/society anymore. Remember that this is where the linkage between merger and public interest exists. Because of such inefficiencies, there will be less benefit for the society. As a result, in the presence of a possible long-term market power that would be created by the merger, there is less reason to expect that this merger will increase public interest.

On the other hand, when we take into account the merger's possible efficiency gains, which is also important component of antitrust merger analysis, as expressed in the Merger Guidelines, it would be reasonable for regulatory agency to question/expect well-structured and reliable projects in the merger agreement that would increase efficiency, productivity, and/or innovation in the relevant market so that it would be possible to ignore a possible increase in market share or power for merging companies by taking into consideration more reliable efficiency gains. As a matter of fact, in the merger agreement, there is only one statement about the potential efficiency gains and two statements about the potential innovation gains from the merger as expressed by the directors Joseph D. Tarry, Pedro A. Blazquez, and Robert D. Kump, as follows, respectively;

"*The scope and diversity of the combined businesses will result in an enhanced ability on the part of PNM to invest in new technologies that produce energy efficiency and enhance energy storage. This will greatly assist PNM in achieving its clean energy goals pursuant to and beyond the requirements of the ETA. Of course, regulatory authority over these investments remains with the Commission."*

"We are committed to ethical principles, good corporate governance and transparency, customer focus, the safety of people and supplies, operational excellence, innovation, protection of the environment, and the Sustainable Development Goals approved by the United Nations."

"We act efficiently and with passion to drive innovation and continuous improvement at both the local and global level."

In those statements, there is nothing related to innovation or competition-based efficiency or productivity gains. In order to understand if Avangrid affiliates have unique innovation-based technologies that can lead to *energy efficiency* for PNM's market activities, one should investigate patents and/or citations for such unique new technologies. If those efficiency statements refer to renewable energy itself as new-technologies, other competitor firms have the same renewable energy technologies as well.

6. Policy Suggestion for the Commission

There is economic rationale for the denial of Avangrid&PNM merger. As clarified in the above analysis, this merger may create an absolute monopolistic market structure in New Mexico electricity market due to the current market shares of both Avangrid in renewable energy markets in the US and PNM in generation, transmission, and distribution segments in New Mexico. Also, market developments in both generation segment and renewable energy market and the existence of rate of return regulation help the merging companies create such a monopolistic market power. If the Commission approves this merger between Avangrid and PNM, Avangrid can completely dominate all the segments from generation to transmission, distribution, wholesale, and retail in New Mexico electricity market. If this happens, there will be welfare transfer from electricity users to the merging companies in addition to the inefficient use of resources based on deadweight loss due to the monopolistic market structure. Such a market structure refers to the maximization of private interests of the merging companies but not public interest, as discussed above. Antitrust laws in the US prohibit such a merger.

In the case of the approval of merger, one alternative to avoid the possible monopolistic effects of the merger would be introducing a new price regulation in the energy markets in New Mexico. In this sense, the Commission should alter its rate of return regulation to incentive-based price-cap regulation to create more efficiency and productivity-based market activities. Such benefits from incentive-based price regulation can occur in several ways. First, rate of return regulation is one of the most influential motivation sources for Avangrid to make massive capital investments in New Mexico. As clarified above, under rate of return regulation, when Avangrid affiliates make more investment, they will make more money based on constant rate of return over their high fixed and sunk cost investments. Because of the very well-known negative effect of rate of return regulation (Averch-Johnson effect) in the

literature, there is almost no reason to expect from Avangrid affiliates not to make such unproductive and inefficient capital investments. Removing rate of return regulation would be useful policy change to avoid such unproductive investments. Second, this would be a useful tool even to incentivize Avangrid affiliates to reduce their cost. Note that, under a typical price cap regulation, regulated utilities will increase their profit as long as there is a decrease in their cost during the regulation period. Assume that the Commission regulates price at a certain level of price-cap for the next 5 years and the profit of regulated firm is the difference between regulated price cap and cost. If the regulated firm can decrease its cost, for example, because of some innovation-based productivity improvement, it will increase its profit as much as the decrease in its cost during the regulation period. When there is a decrease in costs in the current regulation period, the regulated firm will make more money, but consumers will take advantage of it in the next regulation period because regulator will decrease the regulated price-cap as much as the decrease in the cost of regulated firm in the previous regulation period. Note that the profit increase for the regulated firm and the decrease in price in the next regulation period for consumers will be based on efficiency/productivity gains due to price-cap regulation. Third, even though such a policy change in price regulation might not completely stop the merging companies to create monopolistic market structure and to eliminate actual competitors from the market because both Avangrid affiliates and PNM still have strong market power in their market activity areas, it could create an opportunity for potential competition for the future. For instance, even if PNM make all PPAs with Avangrid affiliates, as long as there is incentive-based price regulation such as price caps, this will create opportunity technology and innovation-driven energy developers to compete with Avangrid affiliates in bidding process. Note that if Avangrid affiliates dominate the generation market in providing electricity to meet PNM's power need, it is highly possible that they will make more and more capital investments under rate of return regulation because they will make constant profit over their fixed and sunk costs. They can even report higher costs to make more profit. However, if regulation is price cap, for instance, a technology-driven low-cost developer can enter the market by winning in bidding process and stay in the market.

Lastly, the Commission should unbundle the vertically integrated monopolistic structure of PNM and introduce deregulation to the market. In addition to the effects of unbundling PNM on competition

in the market, a vertically separated market will lessen the potential manipulation of Avangrid&PNM monopoly. Even though the ownership of unbundled market segments can remain under the control of Avangrid&PNM merger, the different market segments could be under the control of different merger affiliates, which would be subject to competition and deregulation in distribution, wholesale, and retail segments. Note that such a competitive pressure from those segments on the merging companies will impede the merging companies from a monopolistic behavior even if those companies have monopolistic market share in the post-merger term.