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# Considering Feasibility in the Creation of the Virginia Clean Economy Act of 2020

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## **Abstract**

Many US States have adopted policies known as renewable portfolio standards (RPS) to address climate change by mandating the production of electricity from renewable energy sources. In 2020, Virginia became one of the few states to implement an RPS that mandates 100% renewable energy by 2045. This bill, known as the Virginia Clean Economy Act (VCEA), has national significance given the partisanship of the state legislature and Virginia's lack of current renewable infrastructure. This case study examined the VCEA and surrounding discussions to determine whether the bill fully addressed concerns of economic and social feasibility, such as proper protections for utility companies, ratepayers, and vulnerable communities within the state. Data sources included the bill text, discussions from the Virginia legislature floor sessions, and an interview with a Virginia Senator who co-sponsored the bill. The findings of this research indicate that the VCEA properly addressed the feasibility concerns of both Dominion Energy and environmental groups, while implementing protections for Virginia ratepayers, especially those in low-income communities. Virginia's new RPS is a comprehensive bill that could serve as an example for other partisan states looking to meet aggressive energy goals in the coming years.

## Introduction

The scientific community has determined that significant reductions in CO<sub>2</sub> emissions are needed to mitigate the impacts of global warming. While many factors and industrial processes contribute to greenhouse gas (GHG) emissions, electricity generation from coal, gas, and other fossil fuels have some of the largest impact, making up over 27% of US emissions (EPA, 2020). Policies are being developed at the international, federal, and local levels to address the threat of climate change by setting broad goals and incentivizing green technologies.

Renewable portfolio standards (RPS) have become the primary method by which states in the US determine their goals for decreasing carbon emissions and converting from traditional energy sources to renewables and clean energy. Only around 60% of states have adopted an RPS with enforced requirements for renewable energy generation, while several more have non-mandatory targets (NCSL, 2021). The specific goals outlined in an RPS can vary heavily; some states have low targets of <10% energy generated by renewables, while other states, such as California and New York, have introduced goals of 60% and 70% respectively by 2030 and 100% clean energy by 2040 (NCSL, 2021).

In 2020, Virginia joined the group of states with ambitious goals when its newly elected legislature proposed and passed the Virginia Clean Economy Act (VCEA), which overhauled the state's RPS to establish new goals for Virginia's two primary utility companies, Dominion Energy and American Electric Power. In addition to introducing a

multiphase RPS target of 100% carbon-free electric energy generation by 2045, the bill also makes specific requirements for grid-scale energy storage capacity and addresses several key environmental justice issues (HB 1526, 2020).

The targets set by the RPS are some of the most ambitious and daunting of any state, especially given Virginia's current lack of infrastructure for renewable energy. Only 6% of electricity generated in Virginia in 2019 was from renewable sources, while 65% of energy came from natural gas (EIA, 2020). Dominion and American Electric will need to meet their RPS targets (assessed in ~5 year steps) or face additional fees, either through purchasing renewable credits or paying fees to the state. Additionally, the requirement of 3,100 new MW of energy storage by 2035 is the largest of any state, including New York and California, which have larger energy markets than VA (ESA, 2020). This sharp turn in state policy stems from the Virginia elections of 2019, which flipped the Senate and House of Delegates to a Democratic majority for the first time in the 21st century. The law was passed with very little bipartisan support, as only one Republican senator and one Republican delegate voted in favor (Virginia LIS, 2020).

This research paper will analyze the extent to which Virginia policymakers considered the feasibility of their new RPS and energy storage goals while writing the legislation. This case study will strictly focus on the VCEA of 2020, looking into the Act's history, debates, stakeholders, and other influencing factors. The findings of the paper will include a summary of any direct references to the feasibility, as well as an assessment of whether the language of the bill addresses future developments and

unpredictabilities. Before the research was conducted, previous literature on renewable portfolio standards and their benefits and shortcomings was considered to help determine metrics for assessing feasibility.

## **Literature Review**

The general environmental impacts of renewable portfolio standards in the US have been previously studied by several researchers, including Wiser et al. (2017), who found that after considering costs and externalities through 2050, RPSs can be a cost-effective way to address our current energy issues. Research conducted by Anguelov & Dooley (2019) found that mandatory RPS goals are effective in increasing renewable energy production. However, the same authors found that slower, incremental standards that allow utilities to use non-solar/wind sources such as biofuels were some of the most effective policies. While these findings support the general policies of renewable portfolio standards, they could also suggest that Virginia's 100% goals may not be as efficient as possible. Thus, further research into why Virginia chose to pursue such aggressive goals is needed.

There are several factors that can influence a state to adopt an RPS. Chandler (2009) found that some of the most important factors in RPS adoption are political, such as the predominant ideologies in a state's legislature. They also found that geographic proximity to other states with an RPS can influence a state's decision to adopt their own. After controlling for political factors, Upton & Snyder (2015) found that the wind and solar potentials for each state also correlate with their chances of having an RPS.

These results will be considered in this research into the VCEA of 2020, as certain political factors within the Virginia legislature may have the potential to influence policy more than technical feasibility does.

Implementation of RPS policies varies state to state, and looking at what shortcomings other states have faced can help inform future policy. A separate case study of the Illinois RPS of 2008 found that an average standard (like that of Illinois) may fail to stay under the electricity cost cap if the state utilities attempt to reach full compliance (Johnson et. al, 2012). While the cost of renewables has fallen significantly since this case study, the chance of economic inefficiencies caused by hitting the cost cap should be addressed while discussing the feasibility of an RPS, especially one with large-scale goals that will require high capital expenditures.

Another important factor to consider when discussing the feasibility of an RPS target is the diversification of renewable energy sources, which prevents a “lock-in” to one technology that hinders the growth of new renewable technologies. Research by Kim and Tang (2020) determined that over-reliance on one type of renewable generation in an RPS can lead to this “lock-in” effect which negatively impacts diversity. The research by Haelg et al. (2018) identified a similar example in Germany, where specific tariffs meant to encourage PV energy ended up hurting the growth of crystalline silicon cells, an economically promising solar technology. They found that these policy effects can decrease grid stability and efficiency, especially in the long term. Because the VCEA sets specific goals for solar, on-shore wind, and off-shore wind as opposed to general

renewable energy goals, it raises the question of whether the state considered these effects in the RPS (HB 1526, 2020).

This pre-existing research has identified strengths, weaknesses, and trends in the adoption of RPS policies in the US and internationally. The work of Chandler (2018) and Upton & Synder (2009) specifically identified some of the key, influencing factors into the development of RPS policies, including political factors and economics.

However, no research on this topic has been published recently enough to include the VCEA, which was only passed last spring. Because renewable energy technologies are growing rapidly and energy systems are changing, it is important to consider the most recent cases of RPS development, such as Virginia. By investigating the legislators' motives and concerns about feasibility, this research can inform future development of a new generation of RPS policies with stringent, ambitious goals.

### **VCEA Purpose and History**

HB 1526 amends and adds a collection of new laws and regulations to the Codes of Virginia, which are all encompassed under the name "Virginia Clean Economy Act". The VCEA can be summarized through its four primary "pillars", which are as follows:

1. A plan to retire all carbon-emitting power plants operated by Dominion and Appalachian Power by 2045 through phased goals and the establishment of a cap-and-trade system for emissions

2. A mandatory energy efficiency resource standard with annual efficiency requirements for utilities and providers
3. A large increase in rooftop solar capabilities and net-metering of distributed power generation
4. The 100% clean energy RPS that paves the way for transition to solar and wind generation, as well as increased energy storage capacity

The bill was authored by Delegate Rip Sullivan (D) of Arlington, VA. The chief patron of the identical Senate bill (SB 851) was Senator Jennifer McClellan (D) of Richmond, VA. These chief patrons, along with several other co-sponsors, worked with stakeholders and energy policy groups to craft the bill, which was first presented in January of 2020. After several amendments and substitutions in both the House and Senate that were voted on in February and March, the final version of the bill was passed on March 7th, 2020, later being signed into law by the Democratic governor Ralph Northam.

### **Research Question**

How much was the feasibility of RPS and energy storage goals considered during the passing of the Virginia Clean Economy Act of 2020? While there are many political and social factors that can influence the long-term success of a law, this paper looked primarily at the consideration of the economic feasibility of the proposed mandates and changes.



## Methods

The Virginia Clean Economy Act is an intriguing subject for an energy policy research case study due to its comprehensive nature, featuring energy storage mandates and environmental justice considerations on top of the new RPS mandates. It was also passed less than a year ago in 2020, making it the most recently adopted RPS policy nationwide as of now. Virginia is also more politically partisan than other states with 100% renewable RPS goals, making it a potential example for how to achieve major energy policy changes at a broader, national level. While Virginia is not the first state to implement 100% renewable goals, it was still selected as a *deviant case*, as it represents the first partisan state to rapidly change energy policy and begin the transition from non-renewables to clean energy (Seawright & Gerring, 2008).

To answer this question, various primary sources were investigated to gain insight into the documents and surrounding discussions of the VCEA. The full bill text, along with bill history, amendments, substitutions, and vote counts are publicly available on Virginia's Legislative Information System. All of these documents were reviewed to search for language and keywords relating to the consideration of economic feasibility in the bill.

In addition to findings within the text, many important issues surrounding the bill were verbally discussed at committee meetings and floor votes in the Virginia House of Delegates and Senate. While no written transcripts of these meetings are publicly available, many of these meetings were live streamed, with the recorded videos being

accessible on the Virginia General Assembly's website. Because the specific days of discussion and voting are outlined in the official bill history on VLIS, relevant videos from the archives of discussions and arguments are available, allowing for detailed analysis. Similarly to the methods for reviewing the written text, any mentions of key concepts relating to economic feasibility were noted. Listening to these discussions also helped identify trends in the types of issues being brought up by members of opposite parties, leading to additional analysis on whether concerns over feasibility contributed to the partisan divide of the bill.

To supplement these findings, Virginia legislators and their staffers were contacted to obtain additional insight and opinions about the bill and the drafting/voting processes, as well as stakeholder information. There is little information about Dominion Energy's role in determining the mandates in the VCEA, which will affect their business's future more than any other utility or private stakeholder. Communication with legislators helped answer these questions.

The combination of text, video, and interview data was used to paint a larger picture of the major talking points and factors that went into the VCEA and its RPS and energy storage goals. If it is found that legislators intentionally crafted the bill in a way which makes energy utility reform feasible in Virginia, it could serve as a leading example for future policies for states with partisan legislatures. If feasibility was not a primary concern the drafting of the bill, it could raise questions about the motivations and potential flaws of the law.

To determine how much feasibility influenced the Virginia Clean Economy Act, the first action taken was to read through the entire bill, as passed by the Virginia House and Senate. This text can be found publicly on the Virginia Legislative Information System website, along with the original text before amendments were made. While the words “feasible” and “feasibility” are only mentioned a couple of times in the text of the bill, there are many other ways that this factor can be addressed. In the following analysis, certain clauses and phrases have been identified that seem to be directly related to addressing the issue of economic/logistical feasibility. An example of this could be the presence of specific plans outlining the steps needed to obtain the goals in the VCEA. Similarly, any references to how the state has identified and plans to economically support non-profitable changes for the utilities would be considered.

The bill summary available on the Virginia LIS breaks the bill into 17 numbered sections. To supplement the text of the bill, quotes and information was taken from the voting discussions that happened on Feb 10th, 2020 and March 5th, 2020 in the VA House of Delegates. These discussions provide voices and reasons to the wording of the bill, allowing for deeper analysis into the intention of the bill authors.

## **Results**

### *Primary Utility Considerations*

One way to address the economic feasibility is by ensuring that the primary utility stakeholders, Dominion Energy and American Electric Power, have the ability to begin

transitioning to renewables while both maintaining a profitable business model and keeping ratepayer prices low. Two sections within the VCEA address this issue, and they are outlined below.

**Section II.** *“Establishes an energy efficiency standard under which each investor-owned incumbent electric utility is required to achieve incremental annual energy efficiency savings that start in 2022...”* (HB 1526, 2020).

**Section V.** *“If ... revenue reductions related to energy efficiency measures ... have caused the utility to earn more than 50 basis points below a fair combined rate of return on its generation and distribution services ..., the Commission shall order increases to the utility's rates for generation and distribution services necessary to recover such revenue reductions”.* (HB 1526, 2020).

The purpose of Section II is to create a requirement for Dominion and American Electric to not only focus on transitioning all of their non-renewable sources to renewables, but to find ways to decrease the total consumption of energy in the state. These annual energy efficiency standards will need to be met by utilities through efficient building design, better HVAC and electrical systems, and other improvements to energy infrastructure. This section is viewed by Delegate Sullivan as one of the most important pieces of the VCEA, as reducing total energy consumption makes long-term transitions to renewables easier by lowering the necessary solar/wind capacity and by reducing electricity costs for ratepayers. During the House floor discussions, Sullivan describes how this is especially impactful because Dominion Energy cannot unfairly profit off of unnecessarily high energy bills, and is instead incentivized by finding the cheapest renewable energy sources (Virginia House Session, 2020a).

The significance of Section V is that it shows a clear foresight by the legislature that investing in these improvements could decrease the revenue for the utilities. By ordering the State Corporation Commission (SCC) to adjust electricity rates to ensure that the utilities are remaining profitable, it shows a focus on the collaborative effort needed between utilities and policy makers when implementing renewable energy systems.

While this section protects Dominion Power from low revenues, many legislators expressed concerns that Dominion would continue to find ways to price gouge and maintain a monopolistic hold over the growing renewable market without proper safeguards. Delegates Rasoul and Carter from the progressive wing of the House Democrats were both “no” votes on the final version of the bill, largely due to the refusal of the majority of the House to vote on amendments that would add such safeguards. However, additional portions of the bill were enough to persuade other progressive democrats such as Delegate Samirah to support the bill anyways, including clauses that promote competition and environmental justice (Virginia House Session, 2020b).

### *Enabling Renewables and Competition*

Another critical portion of the VCEA regarding feasibility was the collection of loosened restrictions on solar and wind that were hindering the growth of renewables in Virginia. Many of these changes are grouped together into VA Codes § 56-585 and § 56-594, which were added as a part of the passing of the bill (Virginia LIS, 2020).

VA Code § 56-585 establishes that 35% of all new renewable energy generation must come from secondary providers that are not Dominion Energy. This clause was specifically added to break up the monopoly that Dominion currently has due to its control over non-renewable energy generation in most of Virginia. This 35% can include both distributed solar (rooftop and home), as well as larger solar/wind farms operated by 3rd party providers who can sell their energy to Dominion.

VA Code § 56-594 also eases restrictions on renewables by increasing the cap for power purchase agreements (PPAs) and by expanding net-metering for distributed solar. The code allows larger solar projects by increasing the maximum capacity for a PPA from 50MW to 500MW, which further incentivizes developers to build solar on-site for most building projects (HB 1526, 2020). Due to the falling costs of renewables such as solar, it is essential that developers and homeowners are not limited by low maximum capacities when installing solar, as these limits can unnecessarily raise electricity prices for ratepayers who would otherwise produce more of their own electricity.

#### *Request for Specific Plan by 2022*

The 16th section in the summary of the VCEA bill is also significant in relation to considerations of feasibility. It states that several government officials and stakeholder groups must report any recommendations to the SCC by January 1, 2022 on how to provide 100% carbon-free electricity at the lowest cost by 2045 (HB 1526, 2020). This

clause is significant because it reflects that many of the details of the plan for attaining RPS goals will continue to be crafted by a diverse group of officials, experts, and stakeholders. Even though the policy of the VCEA was voted into law after a few months of deliberation, the deadline set in this clause provided 20 additional months for the crafting of these specific plans to avoid rushed decisions. The co-sponsor of the bill who was interviewed as part of this research discussed how this is a common legislative solution for planning complex policies. They also mentioned that several future bills could be passed that would supplement the VCEA by providing more specific guidance on how goals should be met and how regulations will be enforced.

### *Opposition in the House of Delegates*

Criticism of the bill came primarily from the conservatives in the General Assembly, but several progressives also expressed major concerns about the bill, some of whom voted against the final version. An overarching theme of both right-wing and left-wing opposition stemmed from the lack of protections for Virginia ratepayers. Progressives argued that legislators overcompensated when implementing protections for Dominion Energy, and that there was not enough pressure on them to identify future energy projects that will be at the lowest cost to ratepayers. An attempted amendment brought by Delegate Rasoul (D) to address this by lowering the maximum cost of future energy projects from 125\$/MWh to 90\$/MWh was rejected by the House of Delegates (Virginia House Session, 2020b). Moderates were worried that it would “poison” the feasibility of new wind projects, which will have slightly higher costs, but will help diversify energy sources and help a different subset of communities than solar alone.

Another concern expressed most heavily by Republicans from the Appalachian region of the state was over the forced closure of coal power plants by 2024. Because these plants play a crucial role in the surrounding communities, legislators were concerned about their constituents and how they would recover the revenue lost by the closures. However, an agreement was reached between the bill authors and some of the Republicans that allowed hybrid coal-biomass plants that were cleaner than standard coal plants to remain operating until 2030, giving more time for the communities to transition, which was enough to gain the vote of one Republican Delegate.

## **Analysis**

### *Conformity to Literature and Past-Research*

The final method used to assess the attention paid to feasibility was to compare the VCEA to past critiques and recommendations provided by previous research on the subject of RPS and renewable policy. This way, it can be determined not only whether the legislature attempted to address feasibility, but whether their work was informed by the most up-to-date research and models.

The article written by Johnson (2012) discussed how exceeding cost caps can limit the success of an RPS by forcing the easing of targets if electricity costs become too expensive. The VCEA attempts to address this issue by making sure that all new renewable energy project proposals need to be less than \$125 per MWh, which prevents the construction of facilities that would greatly increase electricity costs in the state. Some members of the House of Delegates tried to amend the bill to lower this cap



lower to \$90 per MWh because recent renewable farms have been built more cheaply than that, but it didn't gain traction due to hesitation over the possible hindrance towards wind energy. This shows that supporters of the bill are willing to accept slightly higher short-term costs towards rate-payers to develop a more diversified generation portfolio.

This leads into another important factor for RPS success discussed by researchers, which is the avoidance of "lock-in" to one specific energy generation source (Kim & Tang, 2020). The VCEA has several components that encourage several different types of renewable energy generation, including solar, onshore wind, offshore wind, and energy storage. Capacity targets were set for all of these sources to ensure that the renewable energy is coming from diverse sources that limit the likelihood of curtailment or energy shortages. The diversity requirement in energy sources is also critical in making sure that vulnerable communities across the state will have the chance to develop the most efficient clean energy in their area, which varies from coastal communities to coal towns in the Appalachian region. However, the 100% RPS targets were not divided up into exact proportions for specific types of generation, which will help avoid becoming "locked in" to an inefficient technology in the future.

Another way to avoid this phenomenon is by having competitive energy production, which is addressed by the requirement in VA Code § 56-585 establishing that 35% of all new renewable energy generation must come from secondary providers that are not Dominion Energy (Virginia LIS, 2020). This increase in competition will help make sure

that new technologies with higher cost efficiencies will continue to be developed, which will continue to lower the energy costs for ratepayers.

## **Conclusion**

The Virginia Clean Economy Act was described by its sponsors in the House of Delegates as the “biggest infrastructure investment in Virginia history” and was intentionally crafted to make the state a leader in clean energy policy. While a shift towards renewable energy sources is widely viewed as necessary, politicians had not been able to pass significant energy reform legislation until the House and Senate flipped blue in the 2019 election cycle. Virginia faces large economic roadblocks for such reform due to numerous communities that rely on coal and non-renewable power plants to fund the local economy, a lack of current renewable infrastructure, and high electricity costs under Dominion’s utility monopoly in the state. The VCEA carefully addresses all of these primary economic roadblocks by opening doors to flood the market with non-Dominion renewable energy producers, as well as requiring utilities to develop in economically disadvantaged communities. The improvements made between the January introduction of the bill and its passage in March addressed concerns from both progressives and Republicans, which largely focused on protecting ratepayers and vulnerable communities.

Because the VCEA clearly attempts to balance these economic factors and create a clean energy future that is even cheaper and more efficient than the current energy infrastructure, it can be determined that the authors and sponsors of the bill successfully

considered the issue of feasibility in the passing of their bill. While researchers such as Chandler (2009) acknowledge that politics influences RPS policy more heavily than technical factors, it is clear that the Democrats of the Virginia General Assembly did not rush to pass the bill, and instead worked out several internal concerns before the bill was signed into law.

### *Future Work and Limitations*

While this research focused primarily on textual and legislative analyses, more communication with utilities and 3rd party stakeholders could provide more insight on the response to the bill, such as Dominion's views on whether they believe they can meet the goals by the scheduled dates. Additionally, some of the findings of this research rely on assumptions of how these legislative goals will be implemented by the executive branch and by utilities. Once the Secretaries of Commerce and Natural Resources put out their action plan by the end of this year, there will be more tangible information about whether the government is taking proper steps to meet energy and equity goals. At this point, further research should be conducted to test these questions, which can be used to inform Virginia legislators of any potential changes that need to be made to their policies.

Additionally, while this research was limited in scope to identifying whether feasibility was considered, more complex economic models should be conducted to determine how much Virginia electricity rates will change, and whether they will remain low enough

to justify the cause. This model would need to consider the increased costs to pay for grid-renovations and new energy generation/storage infrastructure, but also the decreases due to the low-cost of renewable generation and the benefits of greater grid connectivity and energy efficiency standards.

### *Policy Implications*

The VCEA of 2020 is a landmark bill not only in Virginia, but in the United States. The bill lays out a thoughtful path to 100% clean energy that can be successful in most states, even those with significant coal industries and partisan politics. The bill not only emphasizes the replacement of fossil fuels with renewables, but also numerous other methods to lower energy costs to Virginians, such as energy efficiency programs and environmental justice initiatives. The language of the bill ensures that local labor, especially in vulnerable communities, will be prioritized so that the regional economies can be revitalized through diverse energy infrastructure investments. The bill is also strict with its requirements for Dominion Energy, the largest energy provider in the state. The utility will be highly regulated to make sure that they are meeting RPS goals without unfairly raising prices on ratepayers. Their monopoly will also be broken up by requiring smaller solar and wind developers to enter the market to increase efficiency through net-metering and PPAs, as well as by promoting competition in new technologies.

These policies can be replicated in most other states, especially those with large utilities that dominate most of the market. As the prices of renewables continue to decline and the threat of climate changes grows larger, it should become easier for states to pass policies such as the VCEA to set themselves onto carefully crafted paths to a clean energy future. This focus on feasible, effective, and rapid energy infrastructure improvements will be essential in pushing the US and the world towards meeting international goals to limit climate change and protect future generations for its effects.

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