The Illustrative Costs and Benefits of Wind Delivered to Georgia

2022 Integrated Resource Plan

Introduction

The purpose of this document is to present the results of an illustrative analysis to determine the impacts of both variable and fixed wind[1] delivered to the electric system in Georgia. The purpose of this analysis is to develop a general expectation regarding the costs and benefits of wind delivered to Georgia and to assess the impacts to the operation of the Georgia Power Electric System.

Process and General Approach

This analysis of the costs and benefits of wind was performed according to the processes and methodologies described in the document titled "A Framework for Determining the Costs and Benefits of Renewable Resources ("Framework"). Although the narrative in the Framework focuses largely on solar, the methods and principles apply to the analysis of any renewable resource.

An assumption was made for the purposes of these calculations that the wind could be implemented overnight, thus 2022 is the first year of the study. For clarification, this wind block is added to Georgia Power Company's ("Georgia Power" or the "Company") existing planning case to determine the incremental costs and benefits.[2]

Finally, because the impacts to costs and benefits may be different for fixed wind as compared to variable wind, the analysis was performed for variable wind products. The primary difference between the variable and fixed wind is that fixed wind projects would not require the same integration costs or have the same capacity equivalence since such fixed generation is known and scheduled in advance.

[1] Variable wind is wind that is received "as generated" on a moment to moment basis, fixed wind is wind that is known and scheduled in advance on an hourly-integrated basis.
[2] In this case, the existing planning case refers to Georgia Power's 2022 moderate gas zero-dollar carbon base case including all existing solar and wind commitments.

Summary of Illustrative Results

Table 1 contains a summary of the results for the next 1,000 MW of wind. The results[3] shown in Table 1 are levelized across 30 years beginning in 2022. The value shown in each category is incremental to the base case and represents the benefit or cost of an additional 1,000 MW of wind delivered to Georgia. The acquisition or procurement costs of wind projects are ***not*** included in this analysis.

Table 1: Levelized Costs and Benefits of Wind ($/MWH)

Avoided Energy Costs	**REDACTED**
Deferred Generation Capacity Costs	**REDACTED**
Deferred Transmission Investment	N/A
Avoided Distribution Losses	N/A
Integration Costs	N/A[4]
Total Net Avoided Cost	**REDACTED**

[3] All values are in $/MWH of wind delivered generation. Positive values represent benefits. Negative (red) values represent costs. Areas that are shaded are components that, while appropriately factored into an assessment of the costs and benefits of wind, were not calculated in this iteration of the cost-benefit analysis because the methodology for doing so is either still under development. The values shown are not indicative of any specific value of wind generation in any particular year and should not be used to price any particular wind product. Should there be a need to develop such pricing mechanisms, an analysis should be performed using consistent Framework methodologies and project-specific details and assumptions.

[4] The Company has not completed a renewable integration assessment for wind at this time. Given the low-penetration level of wind in Georgia, the Company is assuming zero integration costs until more information is available or additional analysis is completed.

Figure 1 provides a pictorial representation of the results shown in Table 1.

Figure 1: Levelized Costs and Benefits of Wind ($/MWH)

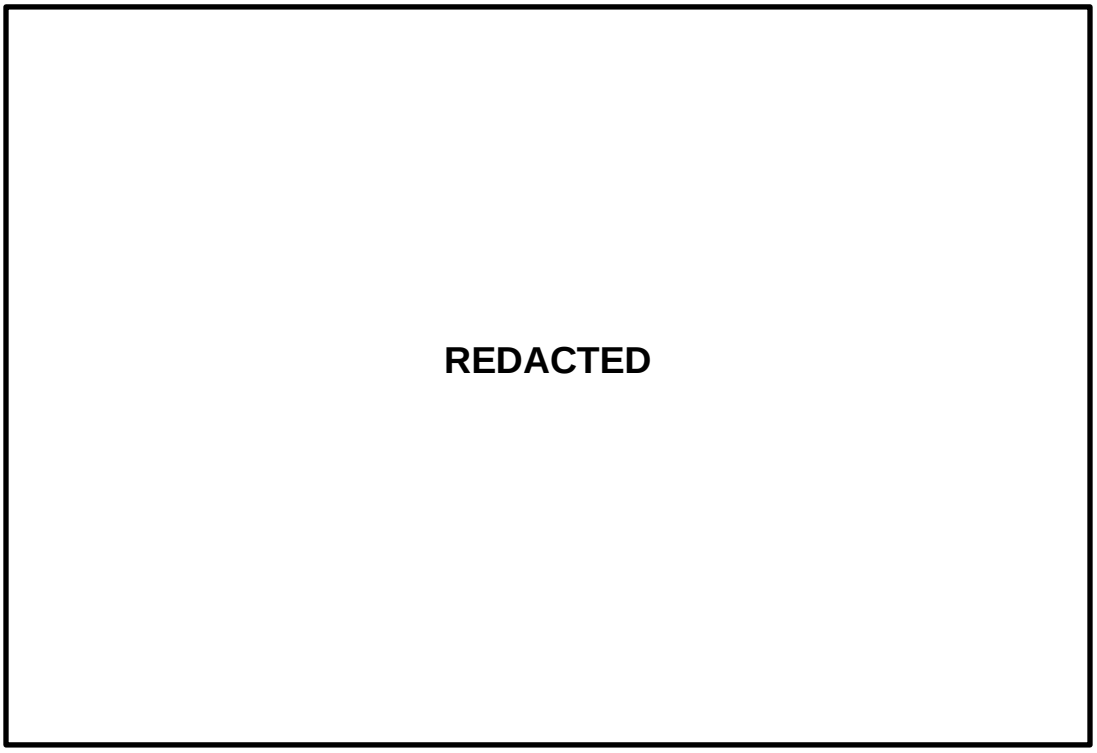
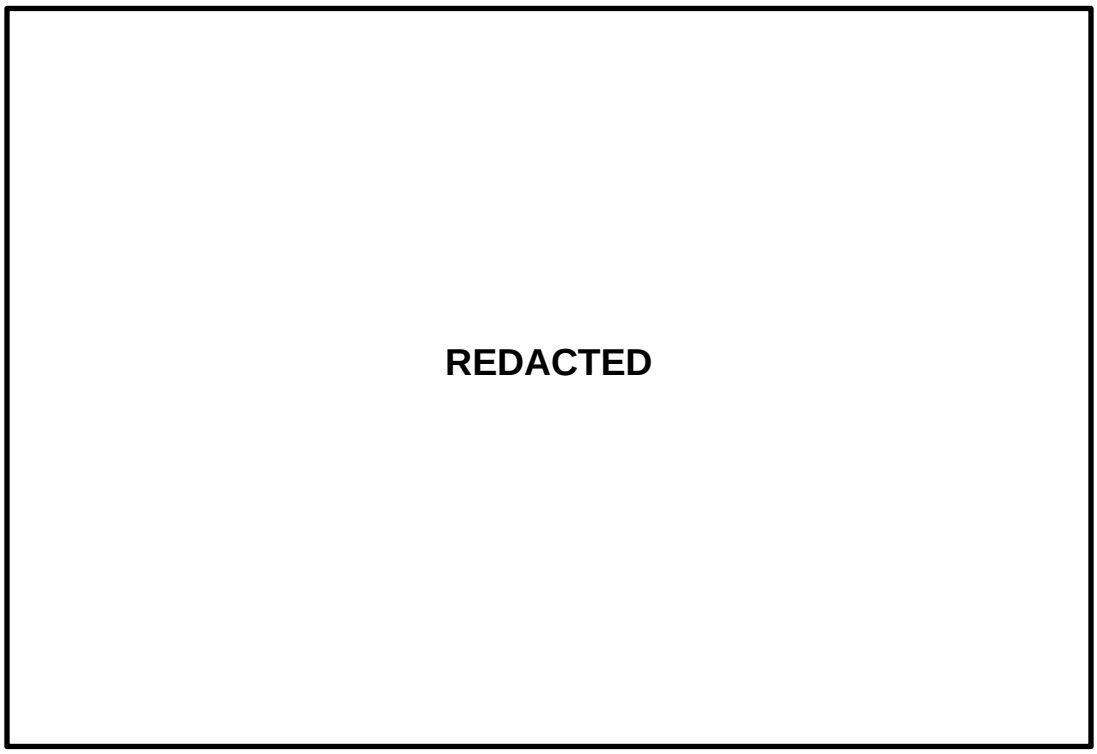


Figure 2 illustrates the benefit and cost impacts for 10, 15, 20, 25, and 30-year terms on a levelized basis. The values in Figure 2 are illustrative and should not be used to infer any specific value of wind generation in any particular year and should not be used to price any particular wind product. Should there be a need to develop such pricing mechanisms, an analysis should be performed using consistent Framework methodologies along with project-specific details and assumptions.

Figure 2: Levelized Costs and Benefits of Wind – ($/MWH)



Conclusions

A number of conclusions can be drawn from these results. First, because of how these specific results were calculated and the assumptions used in calculating them, one conclusion that ***should not*** be made from these results is that wind can or should be added on the system at rates derived from these particular cost benefit results. These results are based on several assumptions that were made for the purpose of determining the relative impacts of adding wind on the system and not for the purpose of determining costs and benefits for any particular project or program. Any specific wind project or program should be evaluated in a similar manner using the Framework along with the appropriate assumptions associated for that program or project.

Conclusions that ***can*** be drawn from these results include the following important observations:

1. Since the wind analysis studied imports of wind to Georgia at the bulk transmission level, there are no Deferred Transmission Investment benefits or Reduced Distribution Losses.
2. The integration costs of wind is unknown at this time. If wind penetration increases, the cost to integrate wind should be considered.
3. The procurement costs and/or transmission delivery costs of these two wind products may be significantly different even though their avoided cost values to Georgia Power are similar.