The Beacon Hill Institute

Peer Review of "The Economic, Utility Portfolio, and Rate Impact of Clean Energy Development in North Carolina"

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Executive Summary

A recent report from RTI International and La Capra Associates claims to find net economic benefits for North Carolina's renewable energy policies, but these benefits are mismeasured and spurious. Orthodox cost-benefit analysis will not find anything like what the report's authors estimate. Many claims are difficult to directly evaluate given the opacity of the report, despite the report's length. Elsewhere, confusing terminology conceals the lack of any evidence that subsidizing green energy will reduce the cost of power in North Carolina.

The primary benefits the report puts forth are an increase in spending in North Carolina. It implies that a $72 million increase directly led to an increase in total spending in North Carolina by $1.4 billion. This is absurd, even when using a Keynesian model of the economy. Since the report assumes that the programs were paid for by reducing other government spending, the best guess is that they had no impact on spending in North Carolina.
The report also projects how much these investments save citizens of North Carolina. It first argues, with an arbitrary calculation methodology, that the measures have already saved North Carolina hundreds of millions of dollars, which implies that energy businesses were too irrational to have taken advantage of such a profit opportunity on their own. Later, the authors of the report assume with certainty that renewable energy will be cheaper in the future than traditional sources of energy, without even allowing for the possibility that similar technological breakthroughs may happen for traditional sources of energy as well (as has happened recently with natural gas). Markets would need to be wrong – not just wrong, but terribly wrong and terribly dysfunctional – in order for any of these assumptions to make any sense.

Hidden in the text, tables, and charts is that there is little to be said for the renewable energy subsidies themselves. The cost savings will be the result of "energy efficiency," not renewable energy. Everything else is trivial. But by giving the impression that "not using energy" counts towards "renewable energy," they claim renewable energy is cheaper.

This "energy efficiency," which will supposedly lead to so many cost-savings amounts to little more than energy efficiency programs in government buildings and mandates in building codes. Cost cutting measures in government buildings are admirable should they follow orthodox cost-benefit analysis, but that has everything to do with cost-benefit analysis and nothing to do with energy. The private market mandates, however, are at best superfluous.

The government does not need to instruct a business owner to install cost-saving measures that will save the business owner money, because the business owner is in a better position to judge what measures will be worth it. The "cost-savings" that take place only as a result of the mandates are unlikely to be worth it.

Introduction

The document prepared by RTI International and La Capra Associates titled "The Economic, Utility Portfolio, and Rate Impact of Clean Energy Development in North Carolina" purports to assess the economic impact of the North Carolina's renewable energy policies. However, the report fails to properly construe the relationship between aggregate spending and employment, while implying costs savings realized by renewable projects which rely on an optimistic view of the efficacy of energy efficiency measures.[1] As presented, the analysis grossly overestimates the relationship between government spending and increased overall spending in several ways. It also argues for the existence of further economic benefits which are impossible to credibly evaluate given the opacity of the document, but go against standard economic logic – e.g., profit maximizing firms. Its assumptions about future electricity market conditions do not include alternative paths for a market that has always been unpredictable. Lastly, it fails to provide any evidence that subsidies for "renewable energy" alone (as opposed to energy efficiency, which will lead to savings by their own assumptions) have led to a penny of cost-savings.

In this document, the Beacon Hill Institute details the shortcomings of the RTI and La Capra report.

Inappropriate Application of Keynesian Analysis

The RTI and LaCapra report states:

> From 2007 through 2012, the clean energy sector in North Carolina spent $1,038 million on constructing renewable projects and $353 million on implementing energy efficiency programs (3-1).

[1] Sara Lawrence, Al Pereira et. al., "The Economic, Utility Portfolio, and Rate Impact of Clean Energy Development in North Carolina," (February 2013) http://energync.org/assets/files/RTI%20Study%202013.pdf

In principle government spending can increase total spending in the economy when there is a shortfall in aggregate demand. For the Keynesian logic to hold, the mechanism by which this *must* occur f is to drive a wedge between government spending and taxation. In other words, it must cause a deficit. Deficits, according to the respected economists such as Paul Krugman and Christina Romer, have a multiplier of 1.5.[2] In other words, $1 dollar of deficit spending increases aggregate demand by $1.5. The authors of this study claim that $72 million in of government spending somehow led to $1,038 million in renewable investment and $353 million in efficiency investment. This implies that the multiplier for government spending in North Carolina is 19.3.

What they leave out, of course, is that the $72 million didn't actually cause that much *new* spending. It *transferred* investment that would have taken place in other industries into green energy. If the $72 million in program cost increased the deficit (or decreased surpluses) by $72 million, the high end of plausible estimates is that this would increase total spending in the state by $108 million. The remaining spending would have taken place either way; it would have just taken place in other industries. Achieving an additional $108 million dollars in spending for North Carolina and the jobs associated with them, in exchange for a fiscal position $72 million dollars worse does not sound like nearly as good of a deal.
The authors do in fact provide traditional "secondary" multiplier effects, but what they seem to fail to understand is that the multiplier is *the* way by which total spending increases in the economy. Except for those "secondary" effects, any one dollar of investment in the green energy sector must come at the expense of a dollar spent elsewhere.

In other words, they are robbing Peter to pay Paul, and claiming the program increased total spending because now Paul spends more, but they ignore accounting for Peter. There are potential ways by which transferring the money increases total spending, and that's where the multipliers come in. The headline spending and jobs estimates the authors make are based on myopically accounting only for Paul.

The fundamental economic concept of "opportunity cost" postulates that there are alternative uses of scarce resources, and the picture is incomplete if we ignore the path not taken. A tropical vacation in the abstract may sound fun, but if it comes at the expense of attending

[2] Paul Krugman, "Conscience of a Liberal: Multiplying Multipliers," *New York Times*, (October 1, 2009) http://krugman.blogs.nytimes.com/2009/10/01/multiplying-multipliers/

your daughter's wedding, it is a bad decision. Just as considering the opportunity cost of time and money is necessary when evaluating one's personal decisions, it is necessary to considering the opportunity cost of labor and capital when evaluating the efficacy of public spending. If the $1.4 billion had not gone towards investments, how would it have been used otherwise? And again, to whatever extent the subsidies increased total spending, that is captured in the multiplier; nearly all of the $1.4 billion would have been spent on something else. That "something else" is the opportunity cost.

The $100.7 million positive fiscal impact "estimated" takes credit for spending that was similarly transferred from other sectors. Claiming a "positive fiscal impact" for these programs is akin to trying to have your cake and eat the entire bakery, too. On the one hand, the authors use a methodology that is only coherent should the increase in spending increase the state deficit. On the other, they claim that it improves the state's fiscal position by $100.7 million.

This increase in spending was based on the assumption that this program would increase the deficit. At times, the report also says the $72 million does not come with a higher deficit. If this is the case, we are then left with even smaller multipliers.

Suppose North Carolina increased taxes to pay the $72 million needed for this program, without cutting other programs. Then a multiplier of 1.5 would not apply; a "balanced budget multiplier" would apply. The government spending of $72 million enters the economy and is multiplied, as before. But it removes $72 million, much (but not all) of which would have also be spent and enter the economy. It is fair to assume that this will still lead to more overall spending, but less than the accepted multiplier of 1.5.

Alternatively, it comes at the expense of other government programs or transfers (this is what they argue in practice, though they fail to understand they need a deficit to get the standard fiscal multiplier). If that is the case, the effect of the $72 million is entirely ambiguous (and probably close to zero). Suppose the government gives a tax credit of $500 to some firm for making a green energy investment. Does the firm sit on the money it saves, or does it quickly spend it? That is what matters, not the dollar value of whatever investment was made. How fast the firm spends that money determines the relevant multiplier. Now suppose instead that

the $72 million went towards building roads instead of the tax credit. This too presumably gets spent. Does the firm sit on the money it makes, or does it quickly spend it? If there is a differential rate at which the money gets re-spent, then there will be a different multiplier. But that effect is small in comparison to the traditional multipliers, and tiny in comparison to the spending claims.

The Specious Basis for Keynesian Analysis at the State and Local Level

Any job creation scheme at the state or local level is dubious, since the only way to get significant numbers job numbers is to increase deficits. There is completely justifiable skepticism of running deficits at the state and local level. As BHI has argued previously, states should leave the management of the demand side of the economy to the federal government, since it is much better positioned to deal with the problems entailed by running deficits.[3]

There are possible reasons for believing that our mix of sources of power is suboptimal due to pollution and global warming. Certain interventions on the market may pass cost-benefit analyses. But renewable energy advocates who really care about this should advocate pollution pricing, which obviates the need for further intervention, instead of policies that favor specific industries and production methods. They should not argue that redirecting spending elsewhere in the economy towards renewable energy will lead to an enormous multiplier, let alone at levels of government that are ill-equipped to partake in deficit spending. Analysis identical to this can show similar economic "benefits" for subsidies to oil, national defense, or sports stadiums.[4]

Changes in North Carolina Spending Patterns Irrelevant

The RTI study employs obfuscating language to produce another savings where there is none.

> [R]enewable energy facilities have generated an estimated 5,728 thousand MWh of energy over the study period. This generation is estimated to have resulted in a total of $276 million in avoided cost and retail energy savings no longer spent on conventional

[3] Ryan Murphy, "Fiscally Illiberal: State and Local Projects Cannot Create Jobs Responsibly," (January 2013) http://www.beaconhill.org/OnTheIssue/Papers/StatesAreFiscallyIlliberal2013-0102RM.pdf.

[4] The economic literature on the public financing of sports stadiums offers a reasonable comparison to the public financing of green energy projects. See John Siegfried and Andrew Zimbalist, "The Economics of Sports Facilities and Their Communities," *Journal of Economic Perspectives* 14, no. 3 (2000): 95-114.

> energy. As Table 3-6 shows, the total REPS rider over the study period is estimated to be $171 million (3-10).

This calculation is buried in a footnote.

> This $276 million was calculated by multiplying 3,328,008 MWh generated by non-thermal renewable projects by $60/MWh avoided cost to yield $194,280,455. The 1,120,193 industrial thermal MWh generated was multiplied by industrial retail savings of $68.20/MWh (EIA, 2012) to yield $76,397,148. Lastly, the 56,502 commercial and residential thermal MWh generated was multiplied by the average retail savings of $99/MWh (EIA, 2012) to yield $5,593,711. Summing the three totals together yields $276,271,314. (3-10, n. 10).

Insufficient information is given in this footnote to evaluate the claim rigorously. A full financial and economic analysis would facilitate an evaluation of the claim, especially the validity of it assumptions. However, the baseline assumption any reasonable economic analysis should make is that private firms maximize profit. If it were the case that cost-savings of this magnitude were available, then private energy firms would have been leaving hundreds of millions of dollars on the table – that is, definitely not maximizing profit – for no apparent reason. If the authors believe they have overturned the fundamental basis for microeconomic theory, they should specify why.

Implicit Assumption of Energy Market Clairvoyance

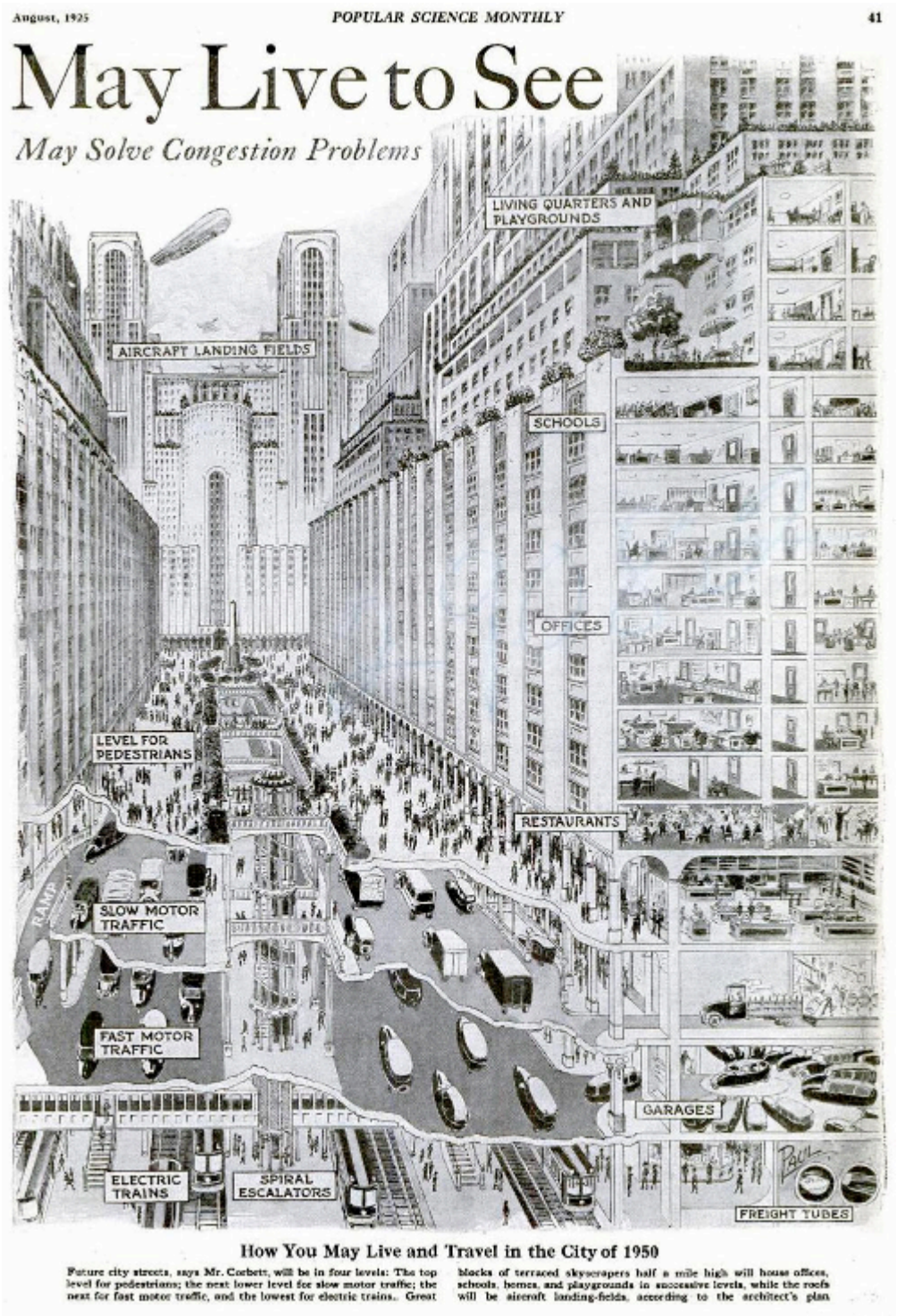
The second big component to the analysis is the improvements in energy costs for North Carolina. The authors do not publish a full financial analysis of the viability of renewable energy and non-renewables, just their assumptions and sources of data (primarily Integrated Resource Plans from organizations friendly to their message). In the absence of explicit financial analyses, the entire section is a black box. In what way are capital costs amortized? How do will these prices project forward in the context of global markets?

Given their sources, however, they do not even offer the possibility that non-renewables will remain cheaper than renewable energy. Of course, if you assume with certainty the result you want, you will obtain that result. The market disagrees with that certainty, which is why market participants do not invest as much as the policy advocates believe is desired. The United States recently witnessed the price for natural gas collapse completely unexpectedly. That is how we should expect future changes to occur, as that is how they have always occurred. For example, the oil price shocks of the 1970s were followed by a price collapse in

the 1980s. Someone may discover a technological breakthrough in green energy, but they may just as easily discover a technological breakthrough in fossil fuels. The belief that one can foresee the path of science and knowledge is evidence only of hubris. The figure below is an infograph from a 1925 issue of *Popular Science Monthly* predicting how cities would look in 1950. We should expect similar predictions about future technologies to be similarly flawed.

The solar power and wind industries have been "just around the corner" for decades now.[5] Perhaps solar or wind will achieve a technological breakthrough that will make it cheaper than the non-renewables, but we shouldn't bank our public policies on assuming that we know what we don't know.

[5] See Vaclav Smil, "Moore's Curse and the Great Energy Delusion," *The American*, American Enterprise Institute, (November 19, 2008) http://www.american.com/archive/2008/november-december-magazine/moore2019s-curse-and-the-great-energy-delusion/.



Source: Simon Rogers, "How the world of 1950 looked in 1925: infograph," *The Guardian*, March 13th, 2012, available at http://www.guardian.co.uk/news/datablog/2012/mar/13/future-cities-graphic-1925 (accessed March 27th, 2013).

Implicit Assumption of Private Market Irrationality

For renewable energy and energy efficiency subsidies to lead to improvements, one must assume that businesspeople in North Carolina are insufficiently knowledgeable to realize this on their own. If all "reasonable people" can agree that renewable energy is imminent and prices will collapse relative to coal and natural gas, the government does not need to subsidize it. Those who position themselves to first supply power with the cheap technology will achieve massive windfall profits. It is only if businesspeople are complete idiots for this not to be the case. If potential investors are only interested if subsidies are offered, it means they don't believe green energy will be profitable without them. In other words, their failure to invest without subsidies demonstrates their lack of belief in the future path of prices of renewable energy, regardless of what these investors claim.

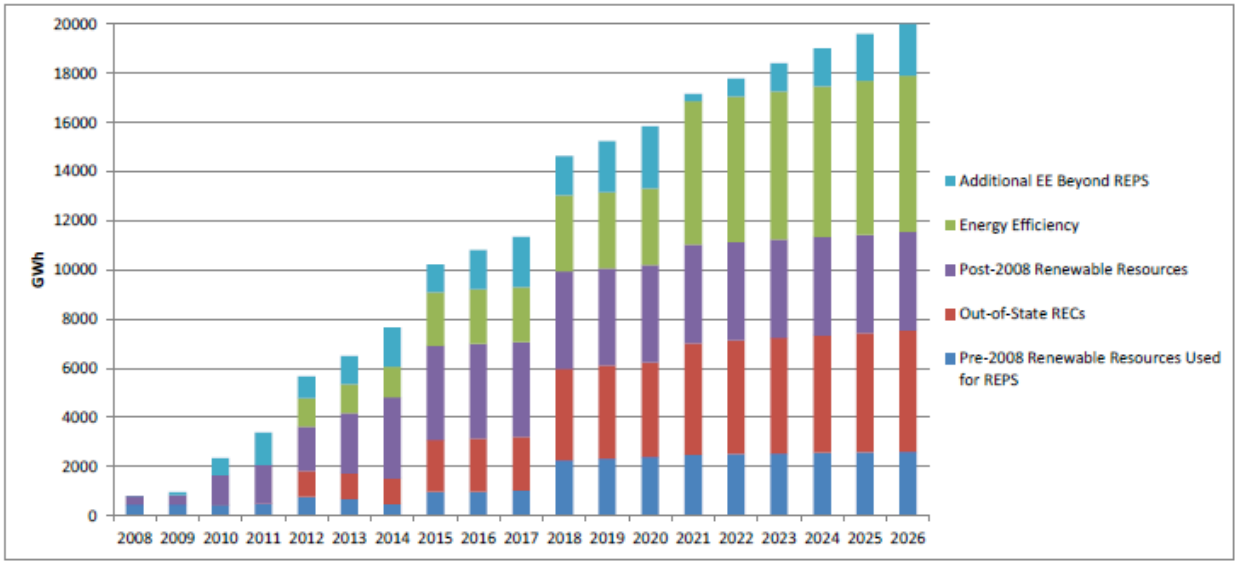
The same argument applies to incentivizing and regulating the private sector to encourage investment in energy efficiency. If there really was the "free lunch" of all these cost savings only if enforced by government mandate, why aren't homeowners and businesspeople already putting them in use? Suppose there will be technological breakthroughs that allow a home to save $10,000 a year by installing energy efficient windows. In the counterfactual where there are no building codes and North Carolina continues to use non-renewables, will homeowners just stare at their collective navels instead of installing the efficiency measures that just make sense? To whatever extent energy efficiency measures will lead to gains, you must assume that the good citizens of North Carolina are incapable of making rational decisions in the absence of a government mandate.

Energy Efficiency Drives the Result But Works in Mysterious Ways

Finally, perhaps the most bizarre component of the document is the confidence in the magnitude of "energy efficiency" in the future. Figure 4-1 shows this to be the biggest component of the Projected Clean Energy Portfolio by 2026. Setting aside the semantics of identifying "using less energy" as "clean energy," how is this anything but wishful thinking? In looking under the hood, there just isn't a lot substantive in "energy efficiency" beyond new building codes and attempts at making energy use in government buildings more efficient. This is what will do the heavy lifting for North Carolina in 2026? We hope to achieve savings

of 6,000 GWh per year by mandating the installation of insulation, electronic thermostats, and the like?

Figure 4-1. Projected Clean Energy Portfolio Output by Source (in GWh)

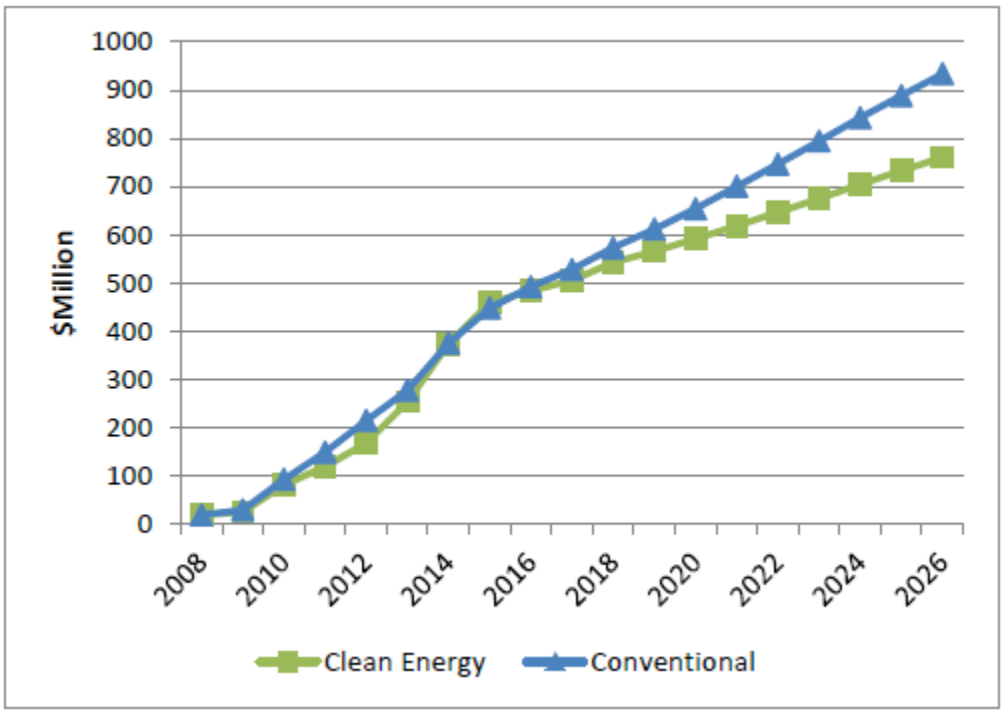


This is exactly what it means, though this has been buried the best they could. In figure 4-4 (reproduced above), they give an attractive looking graph showing how North Carolina can soon save money with renewable energy.

But the text reads,

> The costs of the two portfolios are quite similar through 2016, but thereafter the Clean Energy Portfolio begins to show a lower cost trajectory than the Conventional Portfolio. By 2026, the Clean Energy Portfolio provides about $173 million in generation cost savings compared with the Conventional Portfolio. *These cost savings are largely due to expansion of energy efficiency programs*, which are forecasted to continue to be cost-effective compared with existing, conventional supply resources (4-9, emphasis added).

Figure 4-4. Generation Cost Comparison of Incremental Clean Energy and Conventional Portfolios



This, of course, means that the "cost savings" have little to do with the lower costs of renewable energy (what does "largely" mean? Since the authors do not provide the actual numbers they clearly have access to, one should assume "completely"). Renewable energy isn't the source of the saving; and they are not making energy cheaper with all these investments. What the analysis actually shows is that all of these investments haven't done a thing to reduce prices and that the state should only expect to save energy expenditures because the state spent money on things like energy efficient windows.

In reality, the renewable energy portion of the renewable portfolio will likely increase electricity prices, but for the saving from energy efficiency measures. However, the authors fail to break out the results into the separate components of the "Clean Energy Portfolio" illustrated in Table 4.1 above. If they did, it would be clear that the energy efficiency portion drives the cost savings.

Clearly there is also the question of whether those "cost savings" really are savings, because the energy efficient measures might not be worth it. For example, spending $10,000 on windows to save $100 a year on energy costs is unlikely going to save money before the windows need to be replaced (even setting aside discount rates). The first of these expenditures may be worth it, but it is incorrect to extrapolate from this that future "efficiency" measures will be worth it. There will likely be *diminishing returns* to these

measures. In other words, the first places you start are the best, most obvious areas of improvement. One first replaces the windows in buildings that will save $1,000 a year, not the buildings where it will save $50 a year. After the legitimately good ideas in the public and private sector are put in place, one inevitably begins putting in place marginal or bad ideas.

Of course, programs that cut waste in government buildings are desirable. But there just isn't anything too fundamental about energy and cost savings. The same could be said for government land, capital, and labor. If green energy technology passes a cost-benefit analysis, as traditionally constructed by economists, it is unobjectionable. But it only makes sense to implement this across all types of expenditures, not to single out spending on energy.

Conclusion

The analysis found in "The Economic, Utility Portfolio, and Rate Impact of Clean Energy Development in North Carolina" does not address the economic impact of the North Carolina's programs. An orthodox analysis would consider the economic costs and benefits of such a program, where any benefits would likely be the result of less pollution from renewable sources. Such benefits are likely minimal in comparison to the price tag, and would be nonexistent if pollution were priced. The "benefits" found in their analysis are the result of a fundamental misunderstanding about the relationship between government spending and total spending in an economy. Moreover, claims of savings in the future are the result of energy efficiency mandates, not the green energy itself. The 71-page document claims a great deal, but offers nothing in substance. The authors' claims that clean energy has created 21,000 job-years are unfounded. Such an analysis betrays sound economics. Jobs, after all, are a cost.

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