

# **CLEAN ENERGY INVESTMENTS, JOBS, AND U.S. ECONOMIC WELL-BEING: A THIRD RESPONSE TO HERITAGE FOUNDATION CRITICS**

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## **SUMMARY**

We have reached a consensus with our Heritage Foundation critics on the central point in our research: that investments in clean energy in today's U.S. economy will generate roughly three times more jobs than spending the same amount of money within our fossil fuel energy infrastructure. Our most fundamental difference with the Heritage critics is in interpreting the implications of this agreed-upon result. We hold that there are tremendous benefits to be gained by expanding employment opportunities within the U.S. economy, most obviously at present, with the country facing a severe employment crisis. Moreover, expanding job opportunities while building a clean-energy economy enables us to combine two long-term imperatives: creating decent jobs for U.S. workers and defeating global warming. Janet Campbell of the Heritage Foundation asserts, to the contrary, that the U.S. economy operates under conditions of "labor scarcity," i.e. not enough available workers to fill all the needed positions. Under such conditions of "labor scarcity," according to Campbell, creating more job opportunities in clean energy will be harmful to overall economic efficiency, since it will mean pulling people out of activities where they would be more productive. In Campbell's view, investing in clean energy will "make people work harder, not smarter, and therefore keeps us all poorer." We hold that creating millions of new employment opportunities across all job categories for the purpose of building a clean-energy economy is among the "smartest" initiatives U.S. policymakers could advance at present.

Campbell also heavily criticizes our use of the U.S. Input-Output model for generating our results. However, she ignores a range of methodological issues that we reviewed at length in our paper, and reiterate here. She also ignores the fact that all economic models—without exception—that have used her preferred modeling approach have reached the same conclusion regarding the impact of cap-and-trade legislation on U.S. GDP: that cap-and-trade will have no significant effect on U.S. GDP growth.

## INTRODUCTION

In recent weeks, the Heritage Foundation has released two reports by staff member Karen Campbell attacking our research which finds that investments in clean energy in the United States will be a major engine of job creation in the United States.<sup>1</sup> These criticisms by Campbell mainly reiterate points made in two previous Heritage Foundation attacks on our work, which we have answered at length.<sup>2</sup> Nevertheless, it will be useful to review some of the points raised again in these latest efforts by Campbell.

In our view, the U.S. economy has no choice but to undertake a thoroughgoing transformation over the next 20-30 years to operate at a much higher level of energy efficiency and on a foundation of clean energy sources. This is the only way to insure ourselves and future generations against the real possibility of catastrophic ecological effects of global warming. In our view, politics and intellectual posturing aside, the only serious question in play is how best to achieve this transformation from a primarily fossil fuel-driven economy to a clean-energy economy, not whether or not we still have the option to invest resources in fighting global warming.

According to our research, this necessary transition to a clean-energy economy can also be an important source of new job creation within the United States. We also show that this expansion of job opportunities in the U.S. will be particularly beneficial for people with low incomes,

primarily because it will disproportionately increase employment opportunities for people with relatively low formal educational or employment credentials. Our most recent findings were published in two studies, “The Economic Benefits of Clean-energy Investments,” issued by the Center for American Progress, and “Green Prosperity,” co-issued by the Natural Resources Defense Council and Green for All. These two recent papers were preceded by a related paper by us, “Green Recovery,” issued by the Center for American Progress in September 2008. “Green Recovery” relied on the same methodology as the more recent two papers.<sup>3</sup> The two previous critiques of our work from Heritage Foundation staffers were addressing our work in “Green Recovery.”

The single most important finding underlying all of our published studies in this area is that investments in clean energy create roughly three times more jobs per dollar of expenditure than the same level of spending within the fossil fuel sector—i.e. on oil, coal and natural gas. That is, for every \$1 million in spending, a portfolio of clean-energy investments—including energy efficiency measures such as building retrofits, public transportation, and upgrading the electrical grid; as well as advancing renewable energy sources such as wind and solar power—will generate about 17 jobs. The same level of money spent within the existing oil, natural gas and coal industries generates about 5 jobs. We have shown that there are two main reasons why clean-energy investments create roughly three times more jobs per dollar of spending than fossil fuels.

The first factor is higher “labor intensity” of spending—that is, more money is being spent on hiring people and less on machines, supplies and consuming energy. The second factor is the “domestic content” of spending—more money is staying within the U.S. economy as opposed to buying imports or spending abroad.

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<sup>1</sup> “PERI Study: Ill-Conceived Analysis of Non-Existent Legislation,” (July 17, 2009), <http://blog.heritage.org/2009/07/16/peri-study-ill-conceived-analysis-of-non-existent-legislation/>; and “PERI Report on Clean Energy: The Wrong Question and a Misleading Result,” (July 27, 2009) [www.heritage.org/Research/EnergyandEnvironment/bg2303.cfm](http://www.heritage.org/Research/EnergyandEnvironment/bg2303.cfm)

<sup>2</sup> Our responses to two previous Heritage critiques are at: [www.americanprogress.org/issues/2008/11/heritage\\_response.html](http://www.americanprogress.org/issues/2008/11/heritage_response.html); and [www.americanprogress.org/issues/2008/11/green\\_investment2.html](http://www.americanprogress.org/issues/2008/11/green_investment2.html). A response to another, longer, critique of our approach is here: [www.peri.umass.edu/fileadmin/pdf/working\\_papers/working\\_papers\\_151-200/WP198.pdf](http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_151-200/WP198.pdf)

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<sup>3</sup> All of our recent studies referred to here can be found at: [www.peri.umass.edu/green\\_economics/](http://www.peri.umass.edu/green_economics/). The co-authors of “Green Prosperity,” include Jeannette Wicks-Lim, and of “Green Recovery” include Helen Scharber.

We have derived these findings mainly by working carefully with the Input-Output tables developed by the U.S. Department of Commerce. The U.S. Input-Output tables systematically organize statistics on how business firms within the U.S. economy spend money to produce goods and services—how much they spend, for example on employing workers, equipment, land, structures, and energy. The statistics used in the Department of Commerce model are drawn directly from the Department’s surveys of businesses operating in the U.S.

### **A CONSENSUS WITH CRITICS ON OUR MAIN FINDINGS**

Over the four critiques of our work published by the Heritage Foundation, it is crucial to underscore at the outset that none have challenged our central finding that a given level of investment in clean energy creates roughly three times more jobs within the U.S. than spending the same amount of money within the fossil fuel industry. To be sure, the Heritage authors challenge our conclusion that creating more jobs for U.S. workers while building a clean-energy economy is actually beneficial to the U.S. economy. Dr. Campbell also raises more detailed questions about our technical methods. We have addressed all such concerns in our previous responses, and at length in our new paper, “The Economic Benefits of Clean-Energy Investments,” and we will reprise our responses here. But we need to underscore here that there is in fact a crucial area of consensus between ourselves and the Heritage critics. That is, we and the Heritage critics all agree that, within the context of the current U.S. economic structure, clean-energy investments create about 300 percent more jobs per dollar than spending the same amount of money on fossil fuels. Moreover, we and the Heritage critics agree that that the main reasons this occurs is because clean-energy investments are more labor intensive and have a higher degree of domestic content than fossil fuel spending.

### **IS JOB CREATION TO BUILD A CLEAN-ENERGY ECONOMY BENEFICIAL OR NOT?**

Given a consensus on the central finding, the basic substantive question on which the Heritage authors has challenged is this: is it actually desirable for the U.S. to create millions of new jobs through building a clean-energy economy? Our position on this is unequivocal. We hold that creating new job opportunities, at all levels of the U.S. labor market, is highly desirable. But the Heritage Foundation critics, Dr. Campbell included, claim this is not so. Their main point is that, to create more jobs by building a clean-energy economy, we end up wasting scarce labor resources, which in turn means lowering the economy’s level of productivity. Moreover, when we lower productivity, that means that U.S. living standards will necessarily fall.

Just to ensure that we are representing fairly the Heritage position that creating an abundance of jobs within the U.S. economy through clean-energy investments is undesirable, we will quote from the most recent critiques by Dr. Campbell at some length.

In her July 16 report, Campbell writes as follows:

*“Economic Translation [of a quote in our report]: The cost per BTU is higher in large part because it takes more workers to produce the same amount of energy; i.e. we need to use more of our scarce labor resources to get the same energy, so the cost will be higher. It is not cost driving the number of workers, it is the number of workers that is driving the cost. The authors could have saved themselves the whole analytic exercise if they’d simply recognized that were driving their result, but it was good of them to formally prove it....”*

*“Economic Translation [of a related quote in our report]: Clean energy utilizes labor less productively and continues to make people work harder, not smarter, and therefore keeps us all poorer.” (pp. 1-2)*

In her July 27 report, Campbell returns to this same theme:

*“Basic efficiency considerations are at the core of economic analysis. Ignoring these efficiency trade-offs violates basic principles of economic analysis and puts the report’s conclusions in the realm of fantasy. To the authors’ credit, they clearly acknowledge throughout the study that destroying capital and rebuilding less efficient energy capacity, which makes all workers less productive, means hiring more people to produce the same amount of goods and services”* (p. 6).

Strident rhetoric and posturing aside, what are our basic disagreements with the views expressed here by Campbell, which themselves also reflect the arguments advanced in the previous Heritage critiques?

**1. The U.S. economy today faces a crisis of mass unemployment not “scare labor resources.” Over the long-term as well, expanding domestic job opportunities is highly desirable.**

**Mass unemployment today.** The U.S. economy today is experiencing its most severe employment crisis since the 1930s. According to the U.S. Bureau of Labor Statistics, the official, narrowly-defined official unemployment rate for June 2009 was 9.5 percent. According to the BLS itself, a broader measure of unemployment (or “labor underutilization”) for last June was 16.5 percent. In these circumstances especially, it is a fundamental error—a failure to connect economic reasoning to current-day economic reality—to refer, as Campbell does, to the U.S. economy as operating with “scarce labor resources.” In fact, what the current unemployment statistics tell us is that the U.S. economy today is operating with roughly 15-25 million people (depending on whether we refer to the narrow or broader definitions of unemployment mentioned above) willing and able to be gainfully employed, but who are suffering from unemployment. The overriding, crisis-level problem at present is a *scarcity of jobs*, not a scarcity of people willing to fill jobs. In other

words, the employment crisis today is precisely the opposite of what Campbell describes.

In these circumstances, any government policy initiatives that can effectively reduce mass unemployment need to be considered seriously. The clean-energy agenda is especially desirable on this score because it can be a major engine of job creation in the short run, while, over the long run, it helps advance us toward controlling greenhouse gas emissions and defeating global warming.

**Long-term employment challenges.** We recognize that the U.S. economy will eventually emerge out of its current severe unemployment crisis. At that point, will it be true that the overriding problem in the U.S. labor market will be labor scarcity, as Campbell claims? Will it therefore be true, at that point, that offering an abundance of new job opportunities for people to build the clean-energy economy will constitute a waste of “scare labor resources?”

In fact, even after the current crisis ends, it will still be necessary for the U.S. economy to raise its level of labor intensity and domestic content, to promote good job opportunities at home. This is due to the long-term effects of globalization on U.S. labor markets. Over time, globalization is making more and more U.S. jobs vulnerable to outsourcing to low-wage economies. For example, in a widely discussed article in *Foreign Affairs* in 2006, Princeton economist Alan Blinder argued that increasingly services that can be carried over the internet—including the telephone operators in India with whom we are familiar but also back-office accountants, lawyers, engineers and laboratory technicians as well as their support staffs—can be supplied by employees in poor countries that work for, say, one-fifth the wages of their U.S. counterparts.<sup>4</sup> These would be in addition to the manufacturing jobs that have long been forced to compete with China and other low-wage producers. Blinder’s conclusion, which is broadly accurate in our

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<sup>4</sup> Alan Blinder, “Offshoring: The Next Industrial Revolution?” *Foreign Affairs*, March/April 2006.

view, is that something like 20 – 30 percent of all U.S. jobs—in the range of 30 to 40 million jobs in all—are vulnerable to these outsourcing pressures. The only way to counter these pressures is for employment creation to be made a centerpiece of our public policy. The green investment agenda cannot fulfill this role on its own, but it can move us a good distance in the right direction.

Overall then, neither in the short or long run, are Dr. Campbell or her Heritage Foundation colleagues correct in claiming that the overriding issue for U.S. labor markets is a scarcity of workers to fill positions. Again, we firmly hold that exactly the opposite is the case: the challenge for the U.S. economy both in the short and long run is to find the means to generate an abundance of decent job opportunities within the U.S. economy.

**2. Expanding decent job opportunities through clean energy investments does not reduce productivity and will not, as Campbell claims “keep us all poorer.”**

In fact, we dealt at length with these points in our two June 2009 studies. Campbell chose to ignore our discussions there. We therefore will simply summarize the main findings from those studies.

Are jobs within the green economy low productivity jobs, as Campbell claims? As she makes clear, this is easy to settle within her own perspective. From her perspective, we simply measure productivity in terms of output per employed worker—without considering at all whether some workers are unemployed, or whether some of the output being produced is emitting toxic greenhouse gases. Just to be clear: Campbell’s discussions on this point make no references whatsoever to considerations of unemployment or to the environmental effects of creating output through fossil fuels versus clean energy. This is the case, even though these two interrelated themes were what our own discussions, which she was seeking to debunk, were all about. Thus, by her definition, if we increase la-

bor intensity through clean-energy investments—i.e. if we generate about 17 jobs per \$1 million in spending through clean-energy investments versus about five jobs through spending on fossil fuels—then we reduce labor productivity in the energy sector through shifting spending toward clean energy.

But now let’s return to the discussion of the two basic themes of our studies, i.e. expanding employment opportunities and fighting global warming. First, by raising overall employment, the clean-energy agenda is giving new opportunities to previously unemployed workers. This raises the productivity level of millions of workers from zero to a positive number. Any economy-wide measure of labor productivity has to take account of this effect. Similarly, the clean-energy agenda is creating new opportunities for underemployed workers—and thereby raising their productivity from a lower to a higher level.

Second, given the global climate crisis, it is imperative that we begin incorporating environmental effects in the measurement of output and productivity. That is, spending on fossil fuels creates the output “good” of, for example, electrical power. But it also creates the output “bad” of pollution and greenhouse gas emissions. This point has long been recognized in discussions of the environmental costs of economic growth, and is included in virtually every introductory economics textbook. Thus, with every unit of energy generated by clean investments as opposed to fossil fuels, the net increase in output is greater to the extent that we are not producing the “bad” of pollution and greenhouse gas emissions.

In fact then, the clean-energy agenda raises economy-wide labor productivity substantially through two channels: by expanding total employment per dollar of expenditure in the economy, it provides millions of people with new opportunities to become productive workers; and by generating energy from clean sources, it increases the level of “goods” we produce and corresponding reduces our production of “bads.”

Campbell claims that, through the clean-energy agenda, we will have to ‘work harder, not smarter, and therefore keeping us all poorer.’ Contrary to this claim, here are the basic facts on the range of job opportunities generated by clean-energy investments: the clean-energy agenda will create far more jobs than spending on fossil fuels in all job categories, at all levels of credentials. Thus, there will be roughly 2.5 more job opportunities for people with high credentials, such as scientists, engineers, and business managers working on new energy efficiency initiatives, new ways of producing renewable energy, and bringing these innovations into commercial use. There will also be about four times more jobs for people with high school degrees or less, creating new opportunities for such people to connect in more positive ways to the labor market, and raise their living standards through employment.

But will these people be working “smarter”? This again, depends on one’s definitions. In our view, probably the single most intelligent activity on which someone could work for the next generation would be to create a viable clean-energy economy, as opposed to continuing to rely on our existing fossil-fuel based energy sources that are creating global warming. However, Campbell makes no mention at all of the need to build a clean-energy economy in her definition of what constitutes working “smarter.”

This brings up a final gaping hole in Campbell’s discussion: she fails to mention that we are proposing *new investments* in a clean-energy economy, with roughly 70 percent of these new investments devoted to ways of increasing energy efficiency. These energy efficiency investments include retrofitting our existing homes and work places, upgrading our electrical grid system and expanding public transportation offerings. All of these measures can deliver large-scale energy savings, i.e. means to operate at higher levels of economic activity with significantly lower energy costs. Moreover, these energy savings, as well as the jobs generated to produce these savings, will occur in all commu-

nities throughout the country—all communities have buildings to weatherize, public transportation systems to improve and an electrical grid to upgrade. Thus, even by the narrow definition of productivity that Campbell favors, she should have been able to agree, had she not ignored the matter, that our proposed energy efficiency investments will yield productivity gains throughout the economy.

## METHODOLOGICAL ISSUES

Dr. Campbell asserts vehemently that our methodology for generating quantitative results is deeply deficit, writing, among her other claims, that our “results are meaningless,” and that “the PERI analysis is not an economic analysis”(July 27, p. 1). Such claims contradict her own recognition that our “whole analytic exercise” does “formally prove” that the clean-energy agenda is a major new source of job creation (July 16, p. 2). But we will leave such issues of consistency to one side.

In our “Economic Benefits” paper, we devote considerable attention to methodological questions, including focusing on the specific questions Campbell raises. It is not necessary to review all the points we make there. Interested readers can refer to pp. 21 – 26 of the main text of our paper as well as the full Appendix 1, pp. 48 – 56. For now we would simply add a few basic observations:

1. As noted above, we rely heavily on the U.S. Commerce Department’s Input-Output model in generating our main results. In our paper itself, we discuss at length the limitations of relying on this tool for analytic purposes. Even while recognizing these limitations, we still argue that this is the most reliable empirical estimating tool for our purposes. Campbell claims that our reliance on the Input-Output model means that, in her view, our work is “not an economic analysis” (July 29, p. 1), but rather something beneath economic analysis. She seems to believe that only the analytic methods that she favors constitute actual economic analysis.

We assume that Dr. Campbell is aware that the originator of Input-Output modeling, Professor Wassily Leontief, was awarded the Nobel Prize in Economics in 1973. She is also no doubt aware that the U.S. Commerce Department devotes considerable resources to maintaining and developing their Input-Output model, so that the model can be useful in assisting policymakers and analysts of all sorts in understanding the economy. Campbell, or anyone else, is certainly free to dismiss Professor Leontief's contributions, or to claim that the Commerce Department is wasting taxpayers' money by maintaining and utilizing their Input-Output model. But to claim that working with an Input-Output model is "not an economic analysis" is sophomoric.

2. The reason Campbell seems to think that our model is "not an economic analysis" is that it is not a fully specified computable general equilibrium model. A fully specified computable general equilibrium model seeks to trace through the full set of interactions in the economy that occur as a result of a perturbation. That is, if we were to allow for a major shift in spending out of fossil fuels and into clean energy, a fully specified general equilibrium model would be able to show the full set of effects on prices, wages, employment, technical innovation, business investment, and financial markets. In principle, it would be desirable to be able to work with a model that is capable of showing this full set of interrelationships accurately. But in practice, the actual operations of the economy are far too complex to build a model that accurately represents this full set of interrelationships. This is why all serious model builders have to exercise judgment in choosing where to set priorities between operating with a highly complex and more specified model or maintaining simplicity and clarity.

Campbell heavily criticizes the choices we made in working with a model that places a high premium on simplicity and limits the number of assumptions we are making. However, she seems unaware of the serious difficulties that are

faced by more complex computable general equilibrium models. For example, in the Environmental Protection Agency's most recent analysis of the economic effects of the American Clean Energy and Security Act (the Waxman-Markey proposal), the EPA lists twelve "key uncertainties" for which their model does not account.<sup>5</sup> These "key uncertainties" include the impact of the \$787 billion ARRA stimulus program, including \$80 billion for clean-energy investments, on the cost of climate policy; how much firms will be able to substitute away from traditional energy sources in their business operations; and how people might respond to changing conditions in the labor market. In short, the EPA model offers a highly limited perspective on how the Waxman-Markey legislation may affect the U.S. economy, despite the fact that this model is designed according to the computable general equilibrium approach favored by Campbell. That is, it is not close to providing a full picture of even the most important economic factors that will interact with Waxman-Markey or similar legislative initiatives. How, for example, can one seriously discuss the future of renewable energy and energy efficiency investments in the U.S. if one's model does not consider the unprecedented \$80 billion in government funds pouring into these activities through the ARRA stimulus program? In technical terms, the EPA model is seriously "underspecified," according to its own list of "uncertainties," despite being a general equilibrium model.

3. Campbell seems unaware of the problems that inevitably emerge when working with a full computable general equilibrium model—not simply the EPA energy model, but all such models—even though these problems are well known among professional economists. For example, the most recent macro econometricians to have been awarded the Nobel Prize in Economics were Clive Granger and Robert Engle. The

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<sup>5</sup> See p. 8 of [www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

Granger/Engle approach to observing causal relationships among economic variables is to strip down models to their bare essentials, rather than attempting to create models that replicate all the interactions that occur in an economy operating over time.

4. As we noted in our paper, our approach to model building is to work with the simplest possible models that can generate meaningful and robust results. Our approach closely parallels the aims of good empirical macroeconomic research discussed by Professor Lawrence Summers in his classic paper “The Scientific Illusion in Empirical Macroeconomics.”<sup>6</sup> Summers concludes his paper with the following set of observations:

*“Pragmatic empirical work has contributed a great deal to the development of economics just as experimental and observational work have played a key role in the natural sciences...In evaluating empirical work, we should begin by asking whether the fact reported is an interesting one that affects our view of how the economy operates. Does it affect our belief about a substantive question?...Good empirical work tells its story regardless of the precise way in which it is analyzed. In large part, it is its simplicity that makes it persuasive” (p. 146).*

5. Consistent with the principles presented by Summers, we are heartened that the main findings of our model have been accepted by our Heritage critics. That is, as noted above, we have established a simple, robust result, which stands up to challenges based on alternative modeling approaches. This basic result is that investing in clean energy in today’s economy will employ roughly three times more people than spending the same amount of money within the fossil fuel sector; and that this occurs because investing in clean energy is more labor intensive and has a higher domestic content than spending on fossil fuels. We can debate—and have

debated with our Heritage critics at length—whether this robust empirical fact has positive or negative implications for the U.S. economy. But any such debate will not gainsay the more basic point that we have established an empirical fact that, as Summers puts it, “affects our view of how the economy operates.”

6. As a final point, we should consider the results generated by the computable general equilibrium models favored by Campbell. Campbell claims that our model “ignores the general equilibrium effects of investment spending, fails to account for the price effects induced by a cap-and-trade scheme, and ignores efficiency trade-offs” (July 27, p. 1). What about the results of models that address these matters in the ways favored by Campbell? In fact, in our “Economic Benefits” paper we review in detail the results of all such models that have attempted to estimate the economic impact of cap-and-trade legislation (pp. 40-42), despite our explicitly stated misgivings about such models. Campbell chose to ignore this discussion in our paper. Nevertheless, the basic findings reported there are quite significant, and directly pertinent to the claims made by Heritage Foundation critics.

Most of these forecasts are responding to the carbon cap proposal debated last year in Congress, the Lieberman-Warner bill. Because the cap-and-trade component of the Waxman-Markey bill is similar to that of Lieberman-Warner, these previous forecasting exercises remain useful in assessing the effects of this more recent cap-and-trade proposal. Moreover, the Environmental Protection Agency has, to date, produced two long-term forecasts of the effects of the Waxman-Markey carbon cap proposal itself on economic growth. It is instructive to compare these most recent forecasts with those generated in response to Lieberman-Warner.

In considering first the forecasts of Lieberman-Warner, one central finding stands out above all, even though this basic point has not been recognized widely. This is that, according to *all* the forecasts—including the worst-case scenario

<sup>6</sup> *Scandinavian Journal of Economics*, June 1991, [www.econ.ucdavis.edu/faculty/kdsalyer/LECTURES/Ecn200e/summers\\_illusion.pdf](http://www.econ.ucdavis.edu/faculty/kdsalyer/LECTURES/Ecn200e/summers_illusion.pdf)



developed by the most pessimistic forecasters, the American Council on Capital Formation/National Association of Manufacturers (ACCF/NAM)—the impact of cap-and-trade on U.S. GDP growth rates will be negligible. According to most forecasts, it is almost indiscernible statistically.

What about more recent forecasts focused specifically on the Waxman-Markey bill? These have been produced by the EPA, as noted above. These more recent forecasts affirm in total the earlier conclusions of the forecasts derived from Lieberman-Warner—that a carbon cap will have no significant effect, indeed a barely measurable impact, on the U.S. economy's long-term growth trajectory. These forecasts may all be wrong. But it is still notable that this is the consistent conclusion that emerges from these modeling exercises, without exception. It is also notable that Campbell offers no acknowledgment at all of this consistent set of results, despite the fact that these results have been derived on the basis of the only modeling technique she endorses.

## CONCLUSION

Overall, we have benefitted from the Heritage Foundation critiques, from Dr. Campbell and her predecessors, and we think the exchanges may be useful for ongoing analytic and policy-focused discussions. This is primarily because, despite our obvious sharp differences with the Heritage critics on some issues, we have been able to establish a consensus on the key finding in our various studies: that investing in a clean-energy economy—on energy efficiency and renewable energy—will be a major source of job creation relative to spending on fossil fuels.

We differ sharply with the Heritage critics over the implications of this finding. We hold firmly that the U.S. economy, certainly now, and also into the future, will benefit greatly from creating an abundance of new job opportunities for people at all levels of income and credentials. It is a double benefit that these new job opportunities will mean mobilizing the U.S. workforce to the

epoch-defining project of building a clean-energy economy and thereby defeating global warming.

By contrast, our Heritage critics have focused not on the reality of mass unemployment today, but rather on the notion that available workers in the U.S. economy are actually scarce. Based on their notion that the major problem in the labor force today is scarcity of workers, not mass unemployment, they then conclude that creating millions of job opportunities through clean-energy investments will be harmful to the efficiency of the U.S. economy, because it will entail pulling these workers away from other important activities.

We thoroughly disagree with this Heritage Foundation view. But we appreciate that through their critiques, we have been able to delineate two divergent views on how the economy operates today and what are the ways to best advance human welfare in the United States over time. We hold strongly to the view that that creating job opportunities and fighting global warming are first-order priorities for the U.S. economy, now and over the next generation. Our Heritage critics think that these commitments to job creation and building a clean-energy economy will reduce efficiency and will only create strains on a labor market where workers are now, and will continue to be, scarce. Pulling a scare supply of workers into building a clean-energy economy, in their view, will mean taking them away from some other higher-productivity activity.

Interested readers should now be able to readily distinguish between these two dramatically contrasting perspectives on the most pressing economic questions of our time.

## ABOUT THE AUTHORS

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*Heidi Garrett-Peltier* is a Research Fellow at PERI. She is a co-author of “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy” as well as a number of other recent and forthcoming studies which examine the transition to a clean-energy economy and the role of the public sector.

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