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"Green Collar Jobs in the Clean Energy Economy"

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Thank you for inviting me to testify today. As the President of the Apollo Alliance, an alliance of labor, business, environmental and urban interests working to catalyze a clean energy revolution in America, I'm pleased to offer these thoughts on meeting the challenge of global climate change and creating millions of good "green collar" jobs for men and women across our great nation.

Although we have yet to endorsed any of the specific climate change proposals currently moving through Congress, the Apollo Alliance understands and supports the need to cap global warming pollution and decisively launch our nation on the path to a cleaner energy future. A long term national commitment to capping and reducing carbon emissions will send an essential market signal to investors and decision-makers, and drive investment into a whole new generation of cleaner energy technologies and services, here in America and worldwide. But capping and reducing carbon emissions – alone – will not position our country to lead the world into the clean energy future, with all of the new businesses, products, jobs and exports implied therein. To do that, we must explicitly recognize the climate change challenge for the economic opportunity that it is: the opportunity to transform our country into the cleanest, most energy efficient, most productive nation of Earth, and the world's undisputed leader in clean tech.

And that is where you come in. Our country is respected the world-over for the remarkable way we bring public and private resources to bear to solve scientific and technological challenges. We've done that in medicine, we've done that in space, and now it is time to do the same in the field of clean energy. Fortunately, there are strategies for capping and reducing carbon emissions which, if properly designed, will produce as much as \$100 billion per annum (from the auction of carbon emissions allowances)¹, funds that can and should be reinvested to spur the clean energy revolution in America. If we channel the value of these credits to smart investments in clean power technologies, the revitalization of an advanced, fuel-efficient transportation sector, high-performance, energy-efficient buildings, and new education and training opportunities for green collar workers, our climate policy will create millions of good, new American jobs and foster the growth of a new generation of clean energy enterprises in America, while simultaneously reducing the risk of catastrophic global warming and enhancing our national security.

Four years ago, we issued an analysis of the job creation impacts of our clean energy investment agenda. The analysis showed that a public investment of \$30 billion per year over ten years could generate 3 million good, new clean energy jobs.² While we have yet to assess the job creation potential of a larger, more comprehensive clean energy investment strategy, it is clear that a carefully targeted strategy could generate many more new jobs than our original estimate.

The logic is straightforward:

¹ Darren Samuelsohn, "Big Bucks at Stake in Cap-and-Trade Allocations," *Greenwire*, July 17, 2007.

² The Perryman Group, "New Energy for America – The Apollo Alliance Jobs Report: For Good Jobs & Energy Independence," the Apollo Alliance, January 2004.

First, while job growth in traditional fossil fuel powered-generation and fuels may level off over time with carbon caps, hundreds of thousands of additional jobs will be created in the clean energy technology sector, including renewables, clean coal, and bio-fuels.

Second, transitioning our power infrastructure to cleaner sources will stimulate significant growth in the construction industry. For instance, building an Integrated Gasification Combined Cycle (IGCC) plant with carbon capture and storage (CCS) creates a vast range of jobs for laborers, sheet metal workers, pipe fitters, equipment operators, engineers, project managers, and others.

Third, done right, moving to a clean energy future could create a whole new generation of manufacturing jobs for clean energy parts and components, from advanced technology vehicles and drive trains, to wind towers, solar panels, steel pipes for geothermal plants and CCS, and stainless steel boilers for ethanol refineries. As data from the Renewable Energy Policy Project indicate, if we adopted a national strategy that resulted in 185,000 installed megawatts of renewable energy generation (about 20 percent of our current installed capacity), and if we ensured that component supply was anchored in the United States, renewable energy manufacturing alone could benefit 33,000 manufacturing firms and create 678,000 jobs in just twenty states (see attachment A), including Southeastern and Midwestern states hard hit with manufacturing job loss.

Fourth, jobs in clean energy and in energy efficiency tend to be domestic jobs. By replacing oil imports with domestic bio-fuels, and by moving to a new generation of hybrid-electric, advanced diesel, and other advanced-technology vehicles that use domestic fuel sources, we can keep our petrodollars at home supporting domestic jobs. In addition, if we fully exploit the huge untapped potential for energy efficiency retrofits of our nation's buildings, we will create jobs that, by their nature, must be done here. With the emerging slump in the nation's housing market, there is probably no smarter way to keep our trades people and contractors fully employed than through massive incentives for energy efficient building renovations.

In sum, extrapolating from our earlier estimates, we are confident that a carbon cap and reductions policy linked to a robust clean energy investment agenda will create substantially more than 3 million good, new jobs.

Priorities for Catalyzing a Clean Energy Revolution in America

While the prospect of making a \$100 billion public investment in our clean energy future is promising, only a very disciplined approach to these investments will produce a good return for the American public. In the balance of my testimony, I'd like to suggest seven priorities to guide our nation's clean energy investment strategy, priorities that will provide a four-fold return to the American public by simultaneously cutting greenhouse gas emissions, enhancing national security, expanding our economic competitiveness, and creating good jobs for men and women across America.

First, Congress should fully fund America's clean energy research & development programs, the first stage in the technology development cycle. Public funding for research and development, channeled through our nation's vast network of universities and research institutions, has been responsible for many of the most important technological and scientific breakthroughs we've made as a society. Today as we gear up to meet this critical energy challenge, a challenge of immense proportions both in its scope and its complexity, it is time to give our very best scientists and technologists the resources they need to make the next generation of important discoveries in the clean energy field. Without adequate public dollars flowing to R & D, for instance, we may fall behind in such pivotal technologies as power storage from intermittent renewable energy technology. Furthermore, to the extent that American ingenuity and public investment produce promising new energy technologies, we should not lose the opportunity to manufacture and commercialize these products in America first, much as our competitors now do, and export them to the rest of the world. In the past, we have watched as technologies pioneered in America were commercialized abroad. Solar photovoltaics, for instance, were invented in America with public dollars, but have been largely commercialized and marketed abroad. Clearly this is a mistake we can't afford to repeat.

Second, when necessary, the federal government should support early commercialization of the most promising clean energy and energy efficiency technologies to emerge from our laboratories. New technologies that show promise on an experimental scale sometimes fail to attract sufficient private capital for larger scale commercialization because of the costs involved and the perception of higher risks. Such is the case, for instance, with advanced coal technologies with carbon capture and storage. Demonstration of these technologies at

commercial scale will be essential to attracting the private capital necessary for mass deployment.

Advanced coal with carbon capture and storage (CCS) has vast job-creation potential. As pressure grows to limit carbon emissions, more resources will be devoted to retrofitting outdated pulverized coal plants with more advanced, cleaner-burning technologies, creating thousands of good-paying construction jobs for operating engineers, electricians, laborers, and others. CCS may also require the construction and maintenance of an extensive pipeline system for transporting CO₂; according to a recent study from MIT, the CO₂ pipeline system could eventually be one-third of the size of the system now used to transport natural gas³, generating jobs for steelworkers, pipe fitters, and welders as well as heavy-equipment operators. Finally, exporting advanced coal and CCS technologies developed in the United States to trading partners like India and China will both curb carbon emissions from coal plants globally and create new international employment opportunities for American engineers and geologists.

Third, Congress needs to provide market certainty and predictability to renewable energy producers. The system of two-year tax credits now in place hobbles the renewable industry and must be replaced with longer-term incentives that provide a higher level of certainty to renewable energy investors and producers. Doing so will not only level the playing field with well-subsidized traditional power sources, but establish the central importance of renewables to our nation's energy future. To encourage innovation, and avoid picking winners and losers, incentives should be based on performance, not technology.

³ Massachusetts Institute of Technology, "The Future of Coal," March 2007.

The American Council on Renewable Energy estimates that with consistent public support, renewable energy could provide the equivalent of 50 percent of today's US generating capacity by 2025. Sixty-five percent of that renewable energy potential could come from wind and solar power; geothermal could provide an additional sixteen percent, including all-important base-load power. Funds generated from the auction of carbon credits could be used to reimburse the Treasury for a ten-year extension of the renewable energy production and investment tax credits. Doing so would create a large array of jobs, from laborers who pour the footings for wind towers and iron workers who construct the towers, to pipe fitters who install geothermal facilities and steelworkers who manufacture and assemble components. The Solar Electric Industries Association predicts that just an 8-year extension of the solar investment tax credit would create 55,000 jobs within the solar industry and \$45 billion in economic investment.⁴

Fourth, Congress should develop policies to encourage the manufacture of clean energy components in the United States. Germany, China and other manufacturing powerhouses aren't shy about domestic manufacturing incentives; we shouldn't be either. In addition to its obvious economic benefits, domestic manufacturing furthers our carbon emissions reduction goals in measurable ways: a wind tower shipped halfway around the world has a much larger carbon footprint than a wind tower made in America. Finding ways to encourage domestic manufacturing would also help businesses around our country expand into this emerging manufacturing sector. According to analysis by the Renewable Energy Policy Project, many states have the industrial capacity, supply chains, and skilled workforce needed to expand into renewable energy manufacturing. (See Attachment A.)

⁴ Solar Energy Industries Association, Fact Sheet on the Securing America's Energy Independence Act, 2007.

Today, as you have probably heard from others, the United States is losing the race to capture the renewable energy manufacturing markets of the future. For example, eight of the world's ten largest wind manufacturers are foreign companies and nine of these companies are today building factories in China. Legislation to cap and reduce carbon emissions will help the United States resume the position it once had at the forefront of the renewable energy industry by expanding domestic demand for electricity generated with low- and zero-carbon emissions. Expanding domestic demand, coupled with reforms in our system of tax credits to provide greater certainty, will together do much to attract clean energy component manufacturers to build plants in America. But given the strategic importance of the renewable industry to our clean energy future, Congress may want to go further and consider providing federal loan guarantees and other incentives to manufacturers who build new facilities in the United States or convert idled assembly lines to renewable energy technology. Clean energy manufacturing opportunities would provide high-wage employment opportunities to the 50 percent of the US workforce that has no more than a high school education. And, as you undoubtedly know, manufacturing tends to create larger multiplier effects through local economies than construction or service work by creating local supply chains.

Fifth, Congress should use proceeds from the auction of carbon credits to catalyze a massive public and private initiative to retrofit American buildings, save energy, and dramatically cut domestic energy costs. Heating, cooling, lighting, and industrial processes in buildings consume 40 percent of our energy and produce roughly the same share of our carbon emissions. Clearly, retrofitting our homes, businesses, and public buildings is one of the most

immediate and significant steps we can take as a nation to cut energy costs and use, and reduce carbon emissions.

Although energy retrofits can often pay for themselves with the money saved on electricity bills, federal funding could help states and cities establish revolving loan funds and other financial mechanisms to jumpstart retrofits of public offices, schools, low-income residential properties and other priority properties. Money saved on the energy costs of public buildings could be recycled to hire more teachers, police, firefighters, or healthcare workers. As one of the largest energy users in the nation, the federal government itself could save millions of taxpayer dollars on its own energy bills by expanding programs to retrofit federal buildings across the nation.

Retrofitting the stock of existing buildings will put American men and women to work as energy auditors, sheet metal workers to install advanced HVAC, electricians, plumbers & pipe fitters, building operations and maintenance, and more. Manufacturers of heating and cooling equipment will also get a boost from a national commitment to greater energy efficiency in buildings. Since most older buildings are located in urban areas, Congress should also support initiatives to create green pathways out of poverty for young Americans from the inner city. Building retrofit work offers career ladders starting with basic labor and moving up to glazer, sheet metal worker, electrician, and independent contractor.

Sixth, the carbon cap policy Congress adopts must level the playing field for American industry so the cost of compliance here in America also applies to importers with no comparable carbon restrictions of their own. As has been proposed, this goal could be

accomplished by requiring importers of energy-intensive products not subject to strict carbon controls to buy and surrender US carbon credits before their products enter the US market. This proposal is critical to encouraging our trading partners to follow the US lead in controlling carbon emissions.

Seventh, Congress needs to support education and training initiatives to prepare

Americans for a new generation of green collar jobs in the clean energy economy. The

National Renewable Energy Labs have identified lack of skilled workers as one of the leading barriers to deployment of clean energy technologies.⁵ High schools, vocational schools, junior colleges, labor-management apprenticeship programs, and universities will all be called on to prepare our young people, trades people, managers, engineers, and scientists to fill the gap.

Green collar job training can provide pathways out of poverty for urban youth in renovating energy-leaking buildings. Labor-management training programs often provide some of the best skills training available for trades people and the companies that employ them. Congress should also consider creating a Clean Energy Corps, a service corps to engage Americans of all ages in the challenge of transforming our country's energy future.

Conclusion

From Iraq to New Orleans, from the fuel pump to the melting ice sheets of the Arctic, the tragic consequences of our nation's excessive dependence on fossil fuel are driven home to us every day. This is not a dependence we can afford to ignore. To do so would be a form of national

⁵ R. Margolis and J. Zuboy, "Nontechnical Barriers to Solar Energy Use: Review of Recent Literature," National Renewable Energy Laboratory, 2006.

betrayal: a betrayal of those who have already suffered so much, at home and abroad, and a betrayal of our children and grandchildren whose future is quite literally in our hands.

Let us not fail them. Let us instead carefully and thoughtfully transform this tremendous challenge into a powerful opportunity, an opportunity to make America stronger and more secure, strategically, economically and environmentally. Let us grow a new generation of clean energy businesses and put Americans to work transforming our nation into the clean energy capital of the world. We can do it, and with your leadership and strategic investments in our clean energy future, we will do it. Please, ladies and gentlemen, lead the way.

**Attachment A:
US Renewable Energy Manufacturing Potential of 185,000 MW Installed Capacity
(top 20 states)**

Location	# of Firms	New Jobs Wind	New Jobs Solar	New Jobs Geothermal	New Jobs Biomass	Total New Jobs
Alabama	635	10,085	2,035	997	982	14,099
California	5,409	32,046	48,896	8,465	6,209	95,616
Connecticut	772	6,160	7,757	812	813	15,542
Florida	1,617	8,467	7,718	1,070	1,449	18,704
Georgia	864	8,044	6,285	1,016	1,303	16,648
Illinois	2,289	30,010	19,298	3,396	3,875	56,579
Indiana	1,321	25,180	7,485	3,191	3,365	39,221
Massachusetts	1,193	7,971	12,264	1,186	1,286	22,707
Michigan	2,050	24,350	6,644	1,502	2,281	34,777
Minnesota	1,070	9,246	5,238	1,477	2,444	18,405
Missouri	785	10,260	7,532	2,907	2,097	22,796
New Jersey	1,351	7,870	6,741	1,620	1,467	17,698
New York	1,925	18,523	14,617	8,150	6,640	47,930
North Carolina	1,096	10,964	11,062	2,810	3,708	28,544
Ohio	2,465	29,820	11,833	5,079	4,537	51,269
Pennsylvania	2,188	19,588	15,767	3,402	3,911	42,668
South Carolina	488	11,204	3,559	5,223	2,365	22,351
Tennessee	853	9,011	5,122	1,078	2,451	17,662
Texas	3,358	25,044	23,221	4,660	7,175	60,100
Wisconsin	1,331	25,179	4,943	2,037	2,974	35,133
Totals	33,060	329,022	228,017	60,078	61,332	678,449

Source: Renewable Energy Policy Project, 2007