

**The U.S. House of Representatives  
Select Committee for Energy Independence and Global Warming**

**Testimony of**

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Mr. Chairman and distinguished members of the Committee, my name is Gregory Boyce. I am Chairman and Chief Executive Officer of Peabody Energy. I want to thank the Committee for providing this opportunity to offer written testimony on such a vital topic to the future of America and the world.

By way of introduction, let me first share a few words about Peabody Energy. Peabody is headquartered in St. Louis, Mo., but our reach is global. We are the world's largest private-sector coal company<sup>1</sup> and a global leader in clean coal solutions. We fuel 10 percent of U.S. electricity and 2 percent of global power. We shipped nearly a quarter billion tons of coal to customers in 23 countries on six continents last year<sup>2</sup> – nearly 75 pounds of coal for every man, woman and child in the world.<sup>3</sup> We serve nations representing more than half the world's population, and we have access to some of the most rapidly growing markets for electricity, steel and Btu Conversion.<sup>4</sup>

I feel fortunate to have had a long and varied career in the mining and energy industry. I came to Peabody in 2003 as President and Chief Operating Officer and have extensive U.S. and international management, operating and engineering experience. Previously, I served as Chief Executive Officer – Energy for Rio Tinto PLC based in London. My prior positions include President and Chief Executive Officer

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<sup>1</sup> SEC filings and Peabody analysis (values on a short-ton basis).

<sup>2</sup> Peabody Form 10-K for the Fiscal Year Ended Dec. 31, 2009.

<sup>3</sup> SEC filings and Peabody analysis (values on a short-ton basis).

<sup>4</sup> Peabody Energy coined the term Btu Conversion to refer to a suite of technologies that convert coal to natural gas or liquid fuels.

of Kennecott Energy Company and President of Kennecott Minerals Company.

I serve as Vice Chairman of the World Coal Institute and the National Mining Association. I am on the Coal Industry Advisory Board of the International Energy Agency and am a member of the boards of directors of the Business Roundtable and the American Coalition for Clean Coal Electricity. I chaired the National Coal Council 2006 study, "Coal: America's Energy Future," which was produced at the request of the U.S. Department of Energy. I also serve on the Board of Directors of Marathon Oil Corporation and the Board of Trustees of Washington University in St. Louis.

My company's market position gives me a valuable perspective on global energy demand and supply trends and their implications. And I can say, without exaggeration, that international energy markets have never been more dynamic, nor the potential for supply shortfalls so serious. Decisions made today will impact the United States and nations around the world for generations.

The Great Recession of 2009 reminds us that affordable energy is the foundation of our fragile economy and the engine of our recovery. Coal is the only sustainable fuel able to meet enormous long-term energy needs. It has been the fastest growing fuel in the world for each of the past six years, increasing 37 percent over that period,<sup>5</sup> and coal is expected to continue this growth into the foreseeable future.<sup>6</sup>

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<sup>5</sup> BP Statistical Review of World Energy, June 2009.

<sup>6</sup> International Energy Agency, World Energy Outlook, 2009.

The strongest economic growth engines of the world are in emerging Asia and in nations that are powering their progress with coal. America is also the Saudi Arabia of coal, with more than one-fourth of total global coal reserves.<sup>7</sup> Coal fuels about half of U.S. electricity, at a fraction of the cost of oil and natural gas.<sup>8</sup>

For these reasons and many more, I have often heard coal called a “bridge to the future.” To this, I say: Coal is the future. We view coal through the prism of what I call the “Three Es” – energy security; economic progress; and environmental solutions. Energy policy must be crafted to balance all three. And any regulatory process must start with the needs of everyday people.

- Today, I will discuss our energy needs in the context of an emerging global middle class. Rising standards of living around the world will drive immense demand for all commodities and especially for energy.
- Second, I will address the ways in which coal is America’s competitive advantage. I will assess the possibilities and limitations of our options to address enormous projected energy needs. In recent years, the world has lurched from the worst energy crisis any of us have seen to the most severe economic crisis in several generations. I would submit that we are now seamlessly moving from the latter back to the former. And all this

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<sup>7</sup> Ultimately recoverable demonstrated reserves on Btu basis. Source: USGS, National Assessment of United States Oil and Gas Resources, U.S. Coal Reserves; Energy Information Administration Monthly Energy Review, March 2010 Table 7.2b, 2009 data.

<sup>8</sup> U.S. Energy Information Administration, March 31, 2010.

occurs against a backdrop of ever-increasing environmental expectations. By any objective analysis, greater use of clean coal must be central to any solution. Abundant coal reserves right here in the United States and around the world are sufficient to provide for centuries of low-cost power. We cannot afford to ignore them.

- Third, I will discuss coal's essential role in achieving our climate goals and how technology being advanced today is driving enormous environmental progress. A near-zero emissions future from coal is within reach. I will share our vision for the low-carbon path ahead.
- I will close with the need for technology to be developed and deployed commercially. As policymakers pursue carbon goals, we must provide a realistic basis for determining appropriate limits that do not harm the American consumer, worker and family.

### **Why Coal: Bringing Electricity to Emerging Nations, Lifting Billions to Better Lives**

Mr. Chairman, everyone at the hearing today and every member of your Committee is a member of the so-called "golden billion"; we enjoy a standard of living the rest of the world can only dream about.<sup>9</sup> Yet, as we begin the second decade of the 21st Century, isn't it astounding that more than half the world's population – 3.6 billion people – still lack adequate access to electricity<sup>10</sup>?

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<sup>9</sup> International Programs Center, U.S. Census Bureau.

<sup>10</sup> International Energy Agency, World Energy Outlook, 2009; World Coal Institute, "Coal Tackling Poverty," 2007.

Of that total, 1.6 billion – more than five times the population in the United States – have no electricity at all, according to the International Energy Agency and the World Coal Institute. They seek power for the most basic needs: clean drinking water, light and warmth. Coal is the only energy source with the scale and low cost to alleviate energy poverty.

These numbers suggest a different way of thinking about the most basic of environmental challenges. I urge the Committee to look beyond the government halls where caps and carbon are under debate, and enter the huts of the hundreds of millions of people who live in poverty – the people who daily walk miles to gather firewood and waste to burn for the most basic of energy forms. Consider that the World Health Organization says that 2.5 million women and children die prematurely simply from breathing fumes from biomass stoves every year.<sup>11</sup>

Haiti presents a case study in the energy poverty trap. Even before the January earthquake destroyed the Caribbean country, most Haitians had virtually no access to electricity and depended on felling some 50 million trees<sup>12</sup> annually to produce charcoal for fuel. The destruction of Haiti's forests has left much of the countryside barren, leading to a continuing loss in agricultural productivity and leaving this impoverished nation far more vulnerable to flooding. Burning charcoal briquettes also release fumes that hang in a heavy haze over towns like Port-au-Prince and contribute to a host of respiratory illnesses. This is the

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<sup>11</sup> World Health Organization, 2007 data.

<sup>12</sup> "Haiti: A ravaged land more bleak," Miami Herald, 2004.

environmental crisis that few discuss. But it is just as real and more compelling than many other environmental challenges. And when it comes to energy poverty, the world has far too many Haitis.

Bringing these families out of severe and direct poverty-driven environmental harm must be priority number one, and electrification through large-scale coal generation is that solution.

A growing collection of studies demonstrate the correlation between electrification and improvement in health, longevity and quality of life. A major study by Daniel Klein and Duke University's Ralph Keeney shows that low-cost electricity from coal saves lives, preventing at least 14,000 to 25,000 premature deaths in the United States each year. Another study by respected epidemiologist M. Harvey Brenner of John Hopkins University concludes that removing coal from the energy mix would result in approximately 150,000 deaths each year in the United States.<sup>13</sup>

The United Nations has linked life expectancy, educational attainment and income with per capita energy use,<sup>14</sup> and the World Resources Institute found that with every tenfold increase in per capita energy use, individuals live 10 years longer.<sup>15</sup>

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<sup>13</sup> "Mortality Reductions from Use of Low-Cost Coal-Fueled Power: An Analytical Framework," Analysis by Daniel E. Klein, Twenty-First Strategies, LLC, McLean, Va., and Ralph L. Keeney, Research Professor, Fuqua School of Business, Duke University, 2002.

<sup>14</sup> United Nations Millennium Goals, International Energy Agency, 2005; Analysis by Dr. Frank Clemente, Pennsylvania State University.

<sup>15</sup> Dr. Mark P. Mills, "Want to Improve Your Nation's Health? Burn Coal," Fueling Our Future, World Climate Report, Vol. 3.

As the Global Energy Institute reported last year: *“Every single one of the United Nation’s Millennium Development Goals requires access to electricity as a necessary prerequisite.”*<sup>16</sup>

The good news is that in recent decades hundreds of millions of people around the world have gained access to electric heat and light, refrigerated food and medicine and other necessities. This is in a large part thanks to coal, the world’s most sustainable and affordable fuel.

Still, there are billions more who deserve the same high standard of living we enjoy. Global populations are growing at an unprecedented pace, with Asia expanding at rates that dwarf the Western world’s industrial revolution. For every child in France, 30 are born in India. Some 600 million people fill China’s cities; German cities have 62 million.<sup>17</sup>

In the next quarter century, the population is expected to increase by one-fourth to more than 8 billion people.<sup>18</sup>

Each one of these new citizens will demand modern electricity. So we have the dual challenge of providing electricity to the 3.6 billion people who aren’t properly connected, and expanding our infrastructure to another 2 billion people who will be added to the grid.

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<sup>16</sup> Global Energy Institute, 2008, “Out of Poverty: Coal’s Contribution to China is a Model for the Developing World,” Dr. Frank Clemente, Pennsylvania State University, American Coal Magazine, July 2009.

<sup>17</sup> Analysis of United Nations Population Division, “The World at Six Billion,” Dr. Frank Clemente, Pennsylvania State University.

<sup>18</sup> International Programs Center, U.S. Census Bureau, July 2007.

While near-term energy demands are softened by global economic conditions, the long-term outlook remains strong. World energy demand will grow 40 percent in the next quarter century.<sup>19</sup> Let me put this in perspective: The world will demand the electricity equivalent of approximately 150 Californias in just 20 years.<sup>20</sup>

Coal plays an essential role in meeting global energy needs. International coal use is projected to increase 53 percent by 2030... or more than 1.5 times faster than the combined growth rate of oil, natural gas, nuclear and renewables.<sup>21</sup>

The tremendous power of coal to lift people to a higher quality of life is perhaps most evident in Asia. All of us recognize that China and India are leading the world back to black.

Amid the deepest recession in modern memory in 2009, China's economy expanded a robust 8.7 percent, capped by 10.7 percent fourth quarter growth, according to the National Bureau of Statistics. India was close behind with more than 6 percent growth in 2009.<sup>22</sup>

China is on track to become the world's second-largest economy behind the United States and is powering its progress with coal. Since 1980, Chinese GDP has soared 3,400 percent, an "economic miracle" that has been almost entirely fueled by a 316 percent increase in coal use, according to the IEA. India, too, is moving full

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<sup>19</sup> International Energy Agency, World Energy Outlook, 2009.

<sup>20</sup> Analysis by Dr. Frank Clemente, Pennsylvania State University.

<sup>21</sup> International Energy Agency, World Energy Outlook, 2009.

<sup>22</sup> The International Monetary Fund, World Economic Outlook, 2009.

throttle and is likely to become the world's fastest-growing coal importer. Together, these nations will account for more than 80 percent of the increase in coal demand and half the world's projected energy growth.<sup>23</sup> Yet, if the Chinese and Indians used as much coal per person as the average American, the world would consume nearly twice as much coal as it does today.<sup>24</sup>

To quote Indian Prime Minister Dr. Manmohan Singh in discussing his nation's growing coal consumption: "*Our vision is not just of economic growth, but also of a growth which would improve the life of the common man.*"<sup>25</sup>

The knowledge that China – not the United States – will be the dominant energy user in the future is not lost on the Chinese. Perhaps that is why China continues to invest in energy technologies on an enormous scale. This single nation is home to 36 percent<sup>26</sup> of the world's most advanced supercritical coal plants, and the People's Republic is just getting started. This fact was brought home to me most recently during a trip to Beijing to participate in a historic signing ceremony for the GreenGen clean coal initiative in the Great Hall of the People. Peabody is the only non-Chinese equity partner in GreenGen, China's signature climate initiative and one of the world's largest commercial-scale, near-zero emissions power projects. I will

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<sup>23</sup> International Energy Agency, World Energy Outlook 2008; industry reports and Peabody analysis.

<sup>24</sup> 2007-2008 Human Development Report, United Nations.

<sup>25</sup> Dr. Manmohan Singh, Indian Independence Day speech, 2005.

<sup>26</sup> World Bank, 2008 and Peabody analysis.

discuss GreenGen in greater depth later, but let me simply say that the speed, scale and sophistication of this initiative represent a new reality.

And while Asia's projected energy needs are staggering, more mature economies will continue to demand affordable power to sustain our competitive edge and our modern way of life.

Consider, as a starting point, the fact that every day in the life of the world we use – from all energy sources – the equivalent of 245 million barrels of oil.<sup>27</sup> Demand on that order is undeniable, and it moves in one direction – upward.

Coal's affordability and abundance drive energy security and economic growth, making it a vital fuel for social progress here in the United States and across the globe.

### **Why Coal: The World's Best Engine for Economic Growth and Energy Security**

This brings me to my second topic: Coal's role as the global engine of economic growth and energy security. The recent downturn in the economy has only masked fundamental shifts in global energy markets. The causes of the energy crises of recent years are still with us. Competing resources are still small or strained. What is available is harder to find, more difficult to drill and more expensive to deliver.

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<sup>27</sup> Peter Huessy, GeoStrategic Analysis, Potomac, Md., 2009.

Let me describe some of these patterns in greater depth:

First, we are witnessing a resurgence of resource nationalism and protectionism, or the impulse by governments to tightly control domestic resources and exclude foreign investment. Major oil and natural gas supplies are now concentrated in unstable nations that are increasingly willing to use energy supplies for political gain. For example, more than 60 percent of the world's natural gas is held in Russia, Iran and Venezuela.<sup>28</sup> These are the same nations making headlines for pursuing an OPEC-like natural gas cartel to control supply and price. Expanding the ability of a handful of nations to determine the world's energy destiny must be contrary to global energy security.

Second, when it comes to energy, we need it all. Solutions are not "either/or." We do not face a choice between coal or wind. But we need to appreciate both the advantages and limitations of all energy forms.

In that light, it is often instructive to remember the old adage: "*Those who cannot remember the past are condemned to repeat it.*" For instance, much has been said lately about the promise of shale gas discoveries. Little is truly known. We do not know the eventual cost, sustainability, deliverability, reliability and environmental impact of large-scale shale gas production. We do know that the U.S. has a history of

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<sup>28</sup> International Energy Agency, World Energy Outlook 2009; media reports.

optimistic production projections and high prices. Here's a bit of history from the past decade:

- In 2000, the U.S. Energy Information Administration (EIA) stated “*production from conventional sources is projected to grow rapidly through 2010.*” Production actually declined in seven of the last eight years.
- In 2005, the American Gas Foundation declared: “*6 trillion cubic feet per year ... of liquefied gas is pointed toward U.S. markets.*” We have yet to receive one Tcf.
- In 2008, Michael Stoppard, Director of Gas at Cambridge Energy Research Associates (CERA) claimed: “*The LNG armada has already set sail.*”<sup>29</sup> The lowest amount of Liquefied Natural Gas (LNG) in six years actually arrived.

Natural gas prices have see-sawed wildly in the past decade, and the delivered cost of natural gas in the United States was nearly four times that of coal this past decade (\$5.97 per mmBtu for delivered natural gas compared with \$1.57 per mmBtu for delivered coal).<sup>30</sup> Worse, the price of natural gas is projected to be five times higher than the price of coal in 2030.<sup>31</sup>

More than 90 percent of the new power plants built in the United States since 2000 depend on natural gas. And almost 50,000 additional

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<sup>29</sup> Oil and Gas Journal, Feb. 4, 2008.

<sup>30</sup> U.S. Energy Information Administration, Monthly Energy Review, March 2010 Table 9.10.

<sup>31</sup> U.S. Energy Information Administration, An Updated Annual Energy Outlook, 2009 Reference Case (prices in 2007, \$ per MMBtu).

megawatts of gas capacity will be added by 2012. At the same time, the EIA projects that gas supply will decline 4 percent by 2020. All this virtually guarantees challenges even with new shale supplies.

And the situation could get worse: The EIA's 2009 testimony<sup>32</sup> before the Senate suggests that a cap-and-trade regime would place escalating pressure on existing supplies: "*Our results suggest that [Waxman-Markey] would likely increase the use of natural gas for generation over the next decade in all of the scenarios we analyzed...*"

The conclusion is clear: Rapidly growing demand for gas generation elevates and destabilizes prices for all consumer groups, with great risk to the U.S. economy.

Third, other high-profile forms of energy remain too small or too scarce to provide energy at the scale needed to meet growing global needs. It's worth noting that there's no way to store renewable power, which only operates occasionally, so every new wind turbine or solar panel requires backup from conventional generation when the sun is clouded over or the wind doesn't blow. And renewable investments require additional transmission to get that power to market. Perhaps that's why, after 50 years and more than \$50 billion in investment, wind and solar comprise just 1 percent of today's U.S. energy mix.<sup>33</sup> Replacing the current U.S. coal generation fleet would require 2,400 times today's

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<sup>32</sup> EIA's Analysis of H.R. 2454, the American Clean Energy and Security Act of 2009, Presented to the Senate Energy and Natural Resources Committee, United States Senate, Oct. 14, 2009.

<sup>33</sup> The Congressional Research Service, April 2008.

solar capacity; 40 times the current wind farms currently in place; 250 new nuclear plants or 500 Hoover Dams.<sup>34</sup>

There's a tendency to think of nations in Europe and elsewhere as far ahead of us in renewable fuels. In fact, America has pioneered many green technologies and was the number one producer of wind-generated power and ethanol as recently as 2008.<sup>35</sup>

The sheer scale of our energy needs far exceeds the capacity of any renewable source. Even with the rapid growth of renewables, more than 80 percent of global energy consumed in 2030 will still come from conventional fuels, and only 2 percent of world primary energy is forecast to come from wind and solar, according to the IEA.<sup>36</sup> Simply stated, it is unrealistic to suggest that renewables could replace conventional baseload fuels.

Massive scale... long lead times... tight spare capacity... growing demand... these are the realities we face. A temporary decline in demand hasn't resolved these problems. Our energy challenges have only become more apparent as our recession has eased... from \$70-80 per barrel oil to rising coal prices to a forward curve on natural gas that is fairly high by historical standards.<sup>37</sup>

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<sup>34</sup> Financial Times, Sheila McNulty, "Coal-Rich U.S. Puts Faith in CO<sub>2</sub> Storage," Nov. 3 2009.

<sup>35</sup> Global Wind Energy Council, global installed wind power capacity (MW), 2008; World Watch Institute, installed ethanol capacity, 2008.

<sup>36</sup> International Energy Agency, World Energy Outlook 2009, pg. 74.

<sup>37</sup> Rolling 20-day API2, Brent Crude and London Gas prices for six month delivery, Bloomberg.

The American middle class is already feeling these forces, and your constituents are increasingly pinched at the switch. Within the past seven years, energy costs nearly doubled as a percentage of income for families earning less than \$50,000. Today, the average middle class family of four spends as much as 20 percent of take-home pay on energy expenses, according to U.S. Department of Energy and U.S. Census data.<sup>38</sup> High costs often force hard choices between energy and other necessities like housing, food, education and health care. A recent national poll on behalf of the National Rural Electric Cooperative Association found that nearly six in 10 Americans say they can't afford an increase in their electricity bills and a monthly increase of as little as \$20 would create hardship.<sup>39</sup>

As we chart the course for a sustainable energy future, our most powerful answer, clearly, is coal. The benefit of coal can be summed up by geology and economics. Coal comprises 60 percent of global energy resources.<sup>40</sup> Reserves are large and geographically diverse, from a variety of nations both large and small, developed and emerging, on every major continent. Coal can be easily stored, and coal-fueled electricity is well proven and not weather-dependent. Costs are low. Trade flows are well established. And low-carbon technology is advancing. In the words of the World Coal Institute, "*Coal does not need high-pressure pipelines or dedicated supply routes that need to be protected at enormous expense.*"

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<sup>38</sup> U.S. Department of Energy, U.S. Bureau of the Census analysis by American Coalition for Clean Coal Electricity, "Energy Cost Burdens on American Families," Trisko, Feb. 2010.

<sup>39</sup> Lauer Johnson Research commissioned by National Rural Electric Cooperative Association, "Research Findings on Climate Change, Electricity Usage and Cost, and Cap and Trade Auction Legislation," April 20, 2009.

<sup>40</sup> World Coal Supply and Deposition, U.S. Energy Information Administration, 2005.

Coal's versatility only adds to its attraction. New technologies allow coal to be transformed through "Btu Conversion" applications into transportation fuels and natural gas. America's 400-plus coal-fueled plants are the tireless workhorses of our nation's electric generation fleet, producing the most reliable, most cost-competitive baseload power around the clock, in a world of energy shortfalls.

For example, the state of Missouri, home of Peabody's world headquarters, derives more than 80 percent of its electricity from coal and paid a fraction of the energy costs of consumers in other states in 2009.<sup>41</sup> In its most comprehensive study of the state's energy options, the Missouri Public Service Commission has stated: "*Missouri's fleet of coal-fired baseload power plants has contributed to the highly reliable power supply we have in Missouri and our lower than average electric rates compared with other states.*"<sup>42</sup>

Missouri is no sunbelt state; its access to wind resources is limited; and its legislature recently rejected a bill to support a nuclear plant because the cost would be crippling.<sup>43</sup> The state imports 100 percent of its natural gas today.<sup>44</sup> In other words, Missouri's energy situation is typical. Coal offers Missouri's best option to remain competitive in a global economy.

As overwhelming energy demand looms, dozens of nations are planning ahead. About 250 gigawatts of coal-fueled generation are under

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<sup>41</sup> U.S. Energy Information Administration, March 2010.

<sup>42</sup> The Missouri Public Service Commission, 2006 report.

<sup>43</sup> Research & Markets, "Financial and Regulatory Instability led to Ameren's Callaway-2 Suspension," May 2009.

<sup>44</sup> Platts data, Peabody analysis, 2009.

construction, representing almost 950 million tonnes per year of incremental coal demand. This is the largest build-out of new coal-fueled electricity in a generation; 85 percent of these new operations are in Asia.<sup>45</sup> Equally impressive, in 2010 alone, 92 gigawatts of coal generation are expected to come on line, requiring nearly 365 million tonnes of coal. At this pace, every three years will bring about more than 1 billion tonnes of coal demand.

These new plants will be key to building low-carbon, high-growth economies, and they drive creation of 4.5 million jobs and \$1 trillion in direct economic impacts during construction.<sup>46</sup>

Yet, as Asia builds, America drifts. We continue to depend on our aging fleet and have so far failed to develop a 50-year energy plan for America that utilizes the truly sustainable Three Es as a basic premise.

Let me share just two examples from both coasts that illustrate what could be done on a much larger scale. In Silicon Valley, there's Calera, a startup that is working to commercialize a process that captures CO<sub>2</sub> emissions from coal and locks them into cement. Calera's technology makes coal and cement plants cleaner than solar and wind alternatives. How? By creating low-cost building material using a scalable technology that is not dependent on taxes or subsidies to cut carbon.

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<sup>45</sup> Platts Worldwide Power Plant Database and Peabody analysis, 2009.

<sup>46</sup> Data based on study from Adam Rose and Dan Wei, "Economic impacts of coal utilization and displacement from the continental United States, 2015," July 2006.

A demonstration project at Moss Landing, Calif., can capture 30,000 tons of carbon per year. My company just invested \$15 million in Calera, so you know we believe in this approach.

Cross the country to Cambridge, Mass., and you'll find GreatPoint Energy, a startup that has devised a remarkably cost-efficient and clean means to convert coal to pipeline-quality natural gas. Peabody is an equity partner in GreatPoint and is evaluating the potential of joint coal-to-gas projects with carbon capture and storage and using Peabody's U.S. reserves.

GreatPoint and Calera demonstrate the entrepreneurial energy and enormous promise that still exists here in America... if we will only tap into it.

America has to ask itself... are we prepared to become a bedroom community for China's high-growth industrial economy? Or are we ready to fuel an industrial rebirth with clean coal... of a magnitude not seen in decades? A great president and son of Massachusetts, John Adams, put it best: "*Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passion, they cannot alter the state of facts and evidence.*"<sup>47</sup>

Americans understand this, and despite conflicting signals from Washington, many states are taking steps now to secure their energy futures. Twenty-eight new coal-based generating units are under

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<sup>47</sup> John Adams, Library of Congress, 1770.

construction in America. This remains the largest build-out in decades. These new units will require 65 million tons of new coal annually, nearly two-thirds of which will come from either the Powder River Basin in Wyoming or the Illinois Basin in the Midwest.<sup>48</sup> These highly efficient U.S. coal plants will be the first step in any concerted plan to both meet demand and manage our carbon footprint.

The energy, economic and environmental challenges we face are complex and global. And yet, as is so often the case, the most important decisions will be local. If we fail to act, our nation could face a darker future, which unfortunately has been previewed in rising bills and rolling blackouts elsewhere in the world.

### **How Coal: Our Path to Green Energy**

Coal's vital role in energy security and economic stimulus also carries over into environmental progress. It is clear that coal is the only resource capable of meeting our needs. So when the why coal question is answered, the follow-up turns to how. The simple answer is: 'cleanly.'

That's why I like to say black is the new green. It's a statement that surprises some, inspires friends, annoys naysayers, and intrigues the vast majority who hear it. But it also strikes at the core of the case for coal, and for legislation that advances, rather than penalizes, energy innovation.

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<sup>48</sup> Platts Worldwide Power Plant Database and Peabody analysis.

Consider that tens of billions of dollars have already been invested by utilities in clean coal technologies to eliminate emissions over the past several decades. While Gross Domestic Product and electricity use from coal have tripled in the United States since 1970, coal's environmental efficiency has dramatically improved, resulting in an 84 percent reduction of regulated emissions per megawatt hour based on an analysis of U.S. Environmental Protection Agency data.<sup>49</sup>

So, we know greater deployment of technology is the solution to achieve our environmental goals. Technologies now under development are changing the color of coal, placing us on a path to achieve the ultimate green goal of near-zero emissions with carbon management.

I call this second phase green coal. I'm describing a virtuous cycle. Coal comes from the earth; it creates clean energy from efficient supercritical, gasification and carbon capture and storage... or CCS... technology; and the carbon is sent into deep storage under the earth... or it pushes up as much as 87 billion barrels<sup>50</sup> of additional oil from U.S. fields alone.

Let me be clear: The world needs more than the "bridge" fuels; we need a 21<sup>st</sup> Century fuel... and that is coal. Coal is the only sustainable answer with the scale to serve enormous demand and the technology to address carbon goals.

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<sup>49</sup> Peabody analysis of U.S. Environmental Protection Agency, Clean Air Markets database, January 2009.

<sup>50</sup> National Energy Technology Laboratory, U.S. Department of Energy, "Storing CO<sub>2</sub> and Producing Domestic Crude Oil with Next Generation CO<sub>2</sub>-EOR Technology," Jan. 9, 2009.

Studies suggest that coal with CCS is that low-cost, low-carbon solution. The European Commission states that the cost of achieving climate goals could be up to 40 percent higher without coal and CCS. The IEA says the cost of meeting CO<sub>2</sub> targets could be \$1.3 trillion higher without green coal. And Carnegie Mellon reports that coal with CCS could be 15 to 50 percent less expensive than nuclear, wind or natural gas with CCS.<sup>51</sup>

Natural gas, meanwhile, has been the fastest-growing source of CO<sub>2</sub> this decade in the United States, with carbon emissions from natural gas-fueled generators growing at more than 10 times the pace of coal plants. And natural gas with CCS will be far more expensive than coal with equivalent technology. Let's not again make the mistake of seeking short-term solutions to long-term energy challenges. Coal with CCS is clearly the value investment for our public dollars.

I've discussed carbon capture and storage in concept, but the science of CO<sub>2</sub> capture and storage is concrete and well understood: CO<sub>2</sub> can be separated from the emissions stream and compressed into a liquid state, making it easier and less costly to transport via pipeline. CCS technologies involve injecting CO<sub>2</sub> into aging oil fields to further recover additional oil or deep into saline aquifers or other geology that has stored methane, coal and oil through the millennia.

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<sup>51</sup> Carnegie Mellon University; "Cost and Performance of Fossil Fuel Power Plants with CO<sub>2</sub> Capture and Storage," Energy Policy, 2007; E.S. Rubin, et. al.; "A National Renewable Portfolio Standard? Not Practical," 2008, Issues in Science and Technology, Jay Apt, et. al.; Cost comparisons are based on an integrated gasification combined cycle coal plant with CCS; Natural gas costs reflect the difference between deep CO<sub>2</sub> storage and enhanced oil recovery.

The world has ample room for carbon storage. In the United States, for instance, we could sequester CO<sub>2</sub> for the next century and wouldn't even use up 10 percent of the potential geology that's suitable for storage, based on an analysis by Pacific Northwest National Laboratory. We have, in fact, enough capacity for hundreds of years of storage around the world.

In addition, CCS has been used by the petroleum industry for a half century to increase oil production. Because existing technologies only allow part of the oil in a given reservoir to be recovered, injecting CO<sub>2</sub> into the remaining oil allows greater capture of the "stranded" resource. If the worldwide average oil recovery rate rose just 10 percent through use of CCS, the IEA estimates the increase would be equivalent to new reserves larger than those of Saudi Arabia.<sup>52</sup>

So, I suggest that it is time to stop thinking about carbon only as a cost... and start thinking of it as a competitive advantage. Enhanced oil recovery alone could lead to production of another 2 million barrels of oil per day according to the National Coal Council, a federal advisory committee to the U.S. Secretary of Energy.<sup>53</sup>

We believe there are several crucial steps in advancing the technology.

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<sup>52</sup> International Energy Agency, World Coal Outlook, 2009.

<sup>53</sup> "Low-Carbon Coal: Meeting U.S. Energy, Employment and Carbon Dioxide Emissions Goals with 21<sup>st</sup> Century Technologies," The National Coal Council, 2010.

Here is the path:

First, build supercritical combustion plants with improved efficiencies, which in the United States typically have CO<sub>2</sub> emissions that are 15 percent below the existing fleet... and more than 40 percent below the oldest of plants being replaced.

Second, demonstrate carbon capture and storage. We know the technology works: Statoil's Sleipner project in the North Sea, for example, has been storing 1 million tons of CO<sub>2</sub> annually for 15 years.

Third, complete large-scale CCS demonstrations: world leaders are increasingly calling for rapid CCS deployment.

Fourth, advance coal-to-gas with CCS. One of the benefits of coal-to-gas technologies is the inherent ability to capture a pure CO<sub>2</sub> stream, so the ultimate cost of capturing and storing CO<sub>2</sub> is reduced.

Next, after we demonstrate these technologies, we can deploy commercial-scale IGCC technology with CCS.

And finally: we can retrofit the world's existing fleet of coal plants with CCS technologies to improve CO<sub>2</sub>, just as we've done successfully for many other emissions.

Enormous progress is being made to advance CCS projects. Governments have set aside significant funding for demonstration

plants,<sup>54</sup> and projects are already advancing to a critical mass around the world. American Electric Power's Mountaineer Plant in West Virginia, for instance, will store about 100,000 tons of carbon annually. A few other headlines make my point:

- In the United States, the U.S. Energy Department has pledged \$3.4 billion to commercialize CCS and is moving the landmark near-zero emissions FutureGen project through final technical review.
- In Australia, \$100 million in annual government funding has been made available for 20 commercial scale projects worldwide by 2020, and the Callide oxyfuel project in Queensland is under construction.
- The United Kingdom's energy plan calls for four CCS demonstration projects to be developed. And just last month, British authorities officially launched the Office of Carbon Capture and Storage to speed the development of CCS initiatives.

Not long ago, I toured the site of GreenGen, a widely recognized global model for clean energy from coal. China's multi-phase 650 megawatt GreenGen power plant would be among the world's largest commercial scale near-zero emission coal plants. Phase 1 of GreenGen is under construction and set to begin generation as early as 2011.

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<sup>54</sup> International Energy Agency, "Carbon Dioxide Capture and Storage: A Key Carbon Abatement Option," 2008.

GreenGen also demonstrates that the world's leading coal consuming nation can also be the world's leading clean coal provider. In a joint statement by U.S. President Barack Obama and Chinese President Hu Jintao, the two world leaders recognized the importance of GreenGen.<sup>55</sup> Both leaders cited GreenGen as "21st Century Coal" in the communiqué related to President Obama's visit to China late last year.

Global partnerships and projects like these are essential for securing our energy supplies and achieving our climate goals. Peabody is a leader in clean coal solutions, advancing signature green coal projects and partnerships across three continents.

In Australia, the world's largest coal exporting nation,<sup>56</sup> Peabody is a founding member in the A\$100 million Global Carbon Capture and Storage Institute to help channel public and private investment into low-emissions power projects. Australia has multiple near-zero emissions power initiatives through the coal industry's COAL21 program, which Peabody helps fund.

In North America, we are studying technologies to capture and store carbon at the Consortium for Clean Coal Utilization, a new center founded at Washington University in St. Louis that brings together top research universities and government agencies on multiple continents. We're a founding member of the National Carbon Capture Center along with the U.S. Department of Energy. This initiative will

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<sup>55</sup> The White House Office of the Press Secretary, U.S.-China Clean Energy Announcements, U.S.-China Cooperation on 21st Century Coal, Nov. 17, 2009.

<sup>56</sup> World Coal Supply and Deposition, U.S. Energy Information Administration, 2005.

accelerate the commercialization of low-carbon and near-zero carbon technologies. Peabody is a founding member of the FutureGen Alliance, a public-private partnership in nearby Mattoon, Ill., to develop a near-zero emissions prototype plant that will store carbon deep under ground on day one of operation. And in nearby Kentucky, Peabody Energy has partnered with ConocoPhillips to advance a state-of-the-art coal-to-gas project... Kentucky NewGas... that will bring gas to three-quarters of a million families. Drilling to evaluate carbon storage geology has already begun, and the project could generate 1,200 jobs at the peak of construction.

Still, much more must be done. U.S. Energy Secretary Steven Chu has wisely issued a call to accelerate global development of carbon capture and storage (CCS) technologies with the goal of broad deployment in as little as eight to 10 years.<sup>57</sup> In recent weeks, the Obama administration has charged a new Clean Coal Task Force of federal agencies with breaking down barriers to developing as many as 10 commercial demonstrations of CCS as quickly as 2016.<sup>58</sup> And the IEA is calling for 100 large-scale, fully deployed CCS plants around the world in the next decade.<sup>59</sup>

We'll need to develop a full fleet of GreenGens, FutureGens and ZeroGens. Yet, in its most recent analysis of carbon capture and storage, the IEA concluded that current spending levels are nowhere

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<sup>57</sup> Secretary of Energy Chu: Oct. 12, 2009 Letter to Carbon Sequestration Leadership Forum in London, U.K.

<sup>58</sup> The White House: Office of the Press Secretary, Presidential Memorandum: A Comprehensive Federal Strategy on Carbon Capture and Storage, Feb. 3, 2010.

<sup>59</sup> The New York Times, "IEA Calls for Fast Action on Carbon Storage in Developing World," Oct. 12, 2009.

near enough to achieve deployment goals. I agree. We know that the world will use significantly more coal in the next several decades than it uses today. The question is whether that coal will be used in a low-carbon fashion. Bringing full-scale projects to the finish line is a global challenge and demands a global will.

In the words of former British Prime Minister Tony Blair, “*The vast majority of new power stations in China and India will be coal-fired. Not ‘may be coal-fired’ – will be. So, developing carbon capture and storage technology is not optional, it is literally of the essence.*”<sup>60</sup>

## **A Multi-Step Path for Balanced Carbon Legislation**

As we contemplate ways to achieve global energy and climate objectives, I urge the Committee to consider that the energy system we have right now is the product of more than 100 years of investment. Supplying the energy needs of the world requires time and money – lots of both. Our responsibility now is to prepare the way for the next century... to set in motion the world's next generation of energy technologies, which will be largely fueled by coal.

There is a growing recognition in Washington for the vital role that coal plays in providing energy security and affordable electricity to Americans. We have also seen major support for carbon capture and storage, which is critical to any realistic carbon management program.

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<sup>60</sup> Comments from U.K. Prime Minister Tony Blair, Global Conference on Climate Change in Aspen, Colo., 2008.

Progress will not resemble a sudden turn, but a long arc. And it will require smart, science-based policies to protect the American consumer, worker and family. That's the way America has always targeted emissions reductions, and the best way to deliver energy security, economic growth and environmental progress in the 21<sup>st</sup> century.

For just these reasons, Senator Lisa Murkowski's amendment to the U.S. Environmental Protection Agency's (EPA) fiscal 2010 spending bill is well timed. The Senator seeks to avoid "the "economic train wreck"<sup>61</sup> that would result from the EPA's precipitous "endangerment funding" under the Clean Air Act. EPA could conceivably regulate hundreds of thousands and perhaps millions of buildings, farms, businesses and other facilities in the United States using legislation that was never intended for this purpose. The Senator calls the approach "one of the least efficient and most damaging ways to pursue that goal. It would be rife with unintended consequences, and could be devastating for our economy." We agree.

We are heartened by the bi-partisan consensus building to allow adequate time for a full and robust debate on sweeping energy legislation. Both Sen. Jay Rockefeller's and Rep. Nick Rahall's bills to delay EPA proceedings by two years seem like a good start. Let's not rush into action on an issue of such vital importance and risk making crucial mistakes.

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<sup>61</sup> News release from office of U.S. Senator Lisa Murkowski, "Murkowski Seeks Vote on Amendment on EPA Regulation of Carbon Dioxide," Sept. 23, 2009.

Indeed, it is Peabody's view that too many missteps have already been made with regard to energy and climate goals. Peabody filed a detailed petition citing new information as a basis to urge EPA to reconsider its finding that greenhouse gases endanger human health. EPA had an obligation to render sound judgment and conduct rigorous, peer-reviewed science, but outsourced its scientific analysis to the U.N. Intergovernmental Panel on Climate Change (IPCC). This agency submitted work that has since been shown to be tainted by flaws. Multiple instances of errors, manipulated data and gaps in information make the IPCC's conclusions unreliable. It is clear that the intent of some was to shape a report to satisfy an agenda that is political and not scientific.

Given what we know now about some of the flawed processes and conclusions in the IPCC work, it should be very clear that there is no immediacy to implement regulations that would harm a fragile economy, further suppress investment and raise energy costs for Americans. There *is* ample evidence that climate change is at worst a long-term challenge – not an immediate crisis. There is time to develop low-emissions technologies to maintain economic growth and meet carbon goals. Our focus now should turn from artificial targets and modeled disasters and toward policies that promote solutions.

Draft legislation released by Sens. Jay Rockefeller and George Voinovich is a powerful example of a positive course. The Senators' proposal acknowledges the obvious: Coal will continue to be a

cornerstone of our energy policy, so greater CCS investment, incentives and regulatory certainties are essential.

Here again, the only path to meet CO<sub>2</sub> goals is through technology. So we must continue to advance a business and regulatory framework that enables rapid commercial deployment of near-zero emissions technologies with CCS. I say this after just having returned from China, where the presidents of both of our nations have committed to a clean energy path that includes low-carbon coal.

Peabody is the only non-Chinese equity partner in GreenGen, a near-zero emissions power plant that will begin generating power next year. If China can build these types of plants... why not the United States? The United States could also be a provider of the technology for the rest of the world.

Let me emphasize that Peabody will support the right kind of legislation.

Legislation should build on the positives of the Waxman-Markey House Bill, providing a legal and regulatory structure to enable robust development of CCS that:

- Assumes federal responsibility for CO<sub>2</sub> storage;
- Offers timelines for emissions reductions that allow for technology development; and
- Prohibits duplicative and conflicting frameworks at the state and federal level.

We believe that a strong energy bill that advances CCS is the best way to achieve both our energy and environmental goals. Those goals are not accomplished by cap-and-trade schemes that will result in punishing costs on economies and family budgets. We simply do not believe that a cap-and-trade mechanism can be implemented in a cost effective way. If we are unwilling to guarantee that the cost of managing carbon won't be more than, say, the \$12 per tonne of CO<sub>2</sub> that Sens. Bingaman and Specter advanced several years ago, then we should not claim that carbon can be cheaply eliminated from our society.

Increased focus, funding and rules clarification are all needed to address the challenge of carbon. Technology deployment is not as rapid as any of us would like, but delaying the beginning leads to delays in the ultimate commercial success. And storing carbon for enhanced oil recovery provides an even greater payoff for made-in-America energy security and economic gains.

It is no coincidence that the greatest advances in clean coal technology have come in this past quarter-century, a period of incredible economic expansion and investment in energy. To achieve similar success with carbon management, technology must be commercialized to capture and store carbon, and a comprehensive energy roadmap for America with corresponding legislation providing certainty must be created.

I would encourage Congress to apply the same commitment and funding to advance our coal and carbon capture infrastructure that it is using to pass sweeping health care legislation. The result would unleash enormous job creation and energy security.

### **Shining a Bright Light Forward**

Americans understand coal's potential and strongly support greater use of our most plentiful fuel. An October 2009 survey, conducted by Washington, D.C.-based polling firms American Public.us and RT Strategies, found that more than 60 percent of U.S. opinion leaders support the use of coal to generate electricity, up from 45 percent in September 2007.<sup>62</sup>

To this, I would add that, when it comes to energy, every public opinion poll is clear... Americans want answers. They also want to meet our nation's growing energy needs and climate goals from Middle America rather than importing energy from the Middle East.

With focused action today, that future is within reach. Great progress in America and for billions of people around the world hinges on advancing clean and green coal technology right now.

Perhaps President Obama summarized the need for coal best when he said, "*Clean coal technology is something that can make America energy independent. This is America. We figured out how to put a man on the moon in 10 years. You can't tell me we can't figure out how to*

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<sup>62</sup> RT Strategies National Omnibus Poll/AmericanPublic.us, Thomas Riehle/Mark Allen, September 2007 - October 2009.

*burn coal that we find right here in the United States of America and make it work.*<sup>63</sup>”

It is time we recognize the strength of our international economy is linked to our energy choices... and that we have the power to make change. Together, we can harness the greatest power on earth – our own willpower – to achieve our energy, economic and environmental goals through greater use of clean coal.

Mr. Chairman and members of the Committee... coal advances energy security and provides low-cost electricity that powers our economy and helps people live longer and better.

The real question isn't: "Will we use coal?" The U.S. has more coal than any other nation on Earth. We have hundreds of billions of tons of coal in the United States and trillions of tons of coal in the world. And we will use it all. The real question is: "What is the proper path to move to what the presidents of China and the United States last year called "21<sup>st</sup> Century Coal."

That path is technology first... deployment requirements second... as we work together to accelerate the movement to green coal.

Thank you again for the opportunity to offer testimony to the Committee.

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<sup>63</sup> Remarks by then Senator Barack Obama, Lansing, Mich., Aug. 4, 2008.