

the climate. But those who have insisted that this Congress in this year address climate change have said: If you are not going to address climate change, you can't do the bill from the Energy Committee.

If we brought a bill to the floor of the Senate that established all kinds of benchmarks on CO<sub>2</sub> emissions, how would we then limit CO<sub>2</sub>? We would go back and do these very things I have just described. We would maximize the production of wind and solar energy, the biofuels, a whole series of things that represent what we have done in the Energy Committee. It has never made much sense to me that we would hold up or block the opportunity to do this bill. If we brought this bill to the Senate floor in September or in a lame-duck session, it would be wide open for amendments to offer a climate title.

I have said I will support limiting carbon. I will also support a mechanism to price carbon. I have also said—clearly, many times—that doesn't include cap and trade because I have no interest in the trade piece by creating a \$1 trillion carbon securities market on Wall Street. The reason for my concern about that is, I have watched in the last several years what has happened with respect to various kinds of speculative excesses in other markets. I am not someone who wants to sign up the cost of our energy future to carbon securities traders.

There is an opportunity between now and the end of this year. I hope we don't miss it. It is easy for us to minimize our actions. It is easy to take small steps. It is much harder to take bold steps in the right direction. But I am mindful, as is everyone involved in the political system, that the American people are plenty upset about a lot of things. We have just been through the deepest recession since the 1930s, and we are not out of it yet. There is some improvement, to be sure, but we are not out of this. There are a whole lot of folks out of work, feeling hopeless and helpless. Some have looked for jobs for a year, 2, 2½ years, and can't find them. They are concerned about pension benefits, concerned about Social Security, about whether grandpa and grandma will have decent health care, and concerned about quality schools among other national issues.

They are concerned about whether they live in safe neighborhoods. They are concerned about whether they can find a job or whether they have a job and job security. They are concerned about a lot of things. This is one of them, however, the issue of energy. They worry that if we are not smart and if we don't take action that is bold and decisive in the right direction, we will miss the opportunity to address some very important issues in the future.

The most important issue to me with respect to energy is our unbelievable dependence and vulnerability of having to get so much of our energy outside of our country, especially from areas that

are in troubled parts of the world. We can do a lot better.

We hear a lot of people talking about wanting to hear "made in America" again. I want to hear that about a lot of products. I want to see a vibrant manufacturing industry and sector built once again. But "made in America" can also mean produced in America. We can use our resources—yes, even our fossil energy—if we use them differently.

One final point is the question about the use of hydraulic fracturing for oil and natural gas production. I know this is very technical. In my State, we produce a lot of oil at the moment, and it increases all the time. It is the largest reservoir or largest reserve of technically recoverable oil ever assessed in the history of the lower 48 States. It is called the Bakken shale. That oil shale formation is 10,000 feet underground.

In recent years, we been able to access it with great success. We go down 2 miles, 10,000 feet, with a drill, and then we make a big curve with the same drill and go out 2 miles. So we can go 4 miles, including a curve in the middle, with one drilling rig. Then with a water solution, we initiate hydraulic fracturing to crack open the shale rock to release the oil. I understand that is 2 miles below the surface. It is 100 feet thick. They drill for the middle third of a 100-foot seam 2 miles below the surface. That is how sophisticated it is.

The oil can only be extracted from that deposit by using hydraulic fracturing techniques. The U.S. has been using hydraulic fracturing for 50 years. Some people have raised concerns about what that does to the water table when producing oil or natural gas. There is like chance of doing anything to the water table 10,000 feet below. Hydraulic fracturing has been used for a long time in a way that has not affected the water table. I am very concerned about carefully vetting issues from who have concerns about hydraulic fracturing. I don't want to shut down a substantial portion of that which can be produced in America to support our country's need for home-grown energy in the future. I will have more to say about that at some point when the bill comes to the floor, but I did want to mention that issue because I think it, too, is very important as we discuss energy issues.

All of us want the same thing for our country. We want stability, economic opportunity, and environmental protection. We want to give our kids hope that the future for them is going to be better than the future for their parents. We all want those things. But the only way we will achieve those things is if we at last, at long, long last make some big and bold decisions on a wide range of issues. Yes, fiscal policy on energy policy and on a wide range of other issues, we need to make some big and bold decisions, some of which may not be popular in the short term but are essential for this country's well-being in the long term.

We need to do that now, not later, not next year. We need to take those steps this year. That is why I wanted to talk about the opportunities that still can be achieved well beyond the size of the legislation we are going to consider this week on the oil spill and energy. There is an expanded capability on energy legislation that took us 12 weeks to write. It was passed on a bipartisan basis and represents a menu of things we could and should do in order to address both our vulnerability and dependence on foreign energy as well as to begin to address the issue of climate change.

Mr. President, I yield the floor.

The ACTING PRESIDENT pro tempore. The Senator from Delaware.

Mr. KAUFMAN. Mr. President, I ask unanimous consent to speak in morning business.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

#### STEM EDUCATION

Mr. KAUFMAN. Mr. President, there is no doubt we stand at a critical moment in history. I am honored to be a Senator at this time in our history but even more so to be an engineer Senator. I believe the key to the future of our country and the world rests on the ability of the United States to use STEM—science, technology, engineering, and math—to solve the major problems we face.

You can work on an issue in the shadows for decades and then suddenly the Sun breaks through and it is shining on you and it is shining very brightly. This is one of those moments for engineers, in particular for the promotion of STEM education.

Today, America's engineers have a central role to play in developing the innovative technologies that will help our economy recover and promote real job growth. In particular, as the global economy turns increasingly competitive, many nations are investing heavily in training their future scientists and engineers. We have to do the same.

We do not know from where the next generation of innovation will come. That is the very nature of innovation. But we do know the problems we face. We do know our central economic challenge. When we get through this crisis—and we will—when this recession has passed, we need to create new jobs. It is not enough to try to win back the jobs we have lost. To keep pace with our population and to keep the sacred promise to our children and grandchildren, we need to create a whole new generation of jobs.

As former President Bill Clinton has said, in recent years, we were creating jobs in three areas: housing, finance, and the consumer economy. All three of those benefited from loose credit and easy money to build up a bubble. All three of those have suffered in this economy.

I am very sorry to say that many of those jobs are not going to be coming

back. We cannot look forward to the day where carpenters are scarce because we built more houses than people could afford to buy. We do not need a revitalized legion of clever bankers any more than we need another Starbucks 1 block closer.

So where will tomorrow's jobs come from? I believe the answer lies in science, technology, engineering, and mathematics. STEM jobs will be, and must be, the jobs of the future. Whether it is energy independence, global health, homeland security or infrastructure challenges, STEM professionals will be at the forefront of the most important issues of our time.

In 2008, the National Academy of Engineering convened a panel of technology and engineering leaders to create a list of "Grand Challenges for Engineering." The group included innovators from the private, public, and academic sectors with a wide range of expertise and experience. Eighteen committee members, including such well-known names as Google founder Larry Page and Segway inventor Dean Kamen, set to work to identify engineering challenges—both problems and opportunities—facing those born at the dawn of the 21st century.

After considering ideas and input from experts and the broader general public, 14 Grand Challenges were identified, some of which include: making solar energy economical, providing energy from fusion, providing access to clean water, restoring and improving urban infrastructure, engineering better medicines, preventing nuclear terror, and securing cyberspace.

Clearly, we will need STEM-educated professionals to address these Grand Challenges. In fact, according to a new study released by Georgetown University's Center on Education and the Workforce, by 2018, STEM occupations are projected to provide 2.8 million new hires. This includes over 500,000 engineering-related jobs.

So where will these STEM jobs be? What kind of work will be taking place in these jobs? The answer encompasses a myriad of locations, opportunities, skills, and subject knowledge. The following are just a few examples of what these jobs might look like.

STEM graduates can go into the biomedical fields. In the United States alone, nearly 1 out of 25 people has a history of cancer and 1 out of 13 people has diabetes. Finding scientific solutions to make health care more efficient, both in treatment and in cost, is essential for the health of our people and our economy.

This entails creating personalized medicines tailored to a patient's genetic makeup, processes to quickly and cheaply screen for diseases, materials and techniques to make surgeries and treatments less invasive, biomaterials to aid in the repair of damaged body tissues, and new strategies to overcome multiple drug resistances. Biomedical and materials engineers, as well as scientists with skills in chemistry and ge-

netics, will be needed to tackle these issues.

STEM graduates can pursue jobs in clean energy fields, such as solar energy. Currently, solar energy's share of the total energy market is small—below 1 percent of total energy consumption. It is estimated by 2030, however, that solar electricity has the potential to satisfy the electricity needs of almost 14 percent of the world's population.

To get there, scientists and engineers will need to help us overcome the various practical and economic barriers to widespread solar power usage. This will require new technologies to capture the Sun's energy, to convert it to useful forms, and to store it for use when sunlight is unavailable. Electrical and computer engineers will be needed to lead the way and, indeed, in Delaware, my home State, they already are.

A consortium lead by engineers from the University of Delaware achieved a recordbreaking solar cell efficiency of 42.8 percent. Solar cells, as you know, convert the Sun's energy into electricity. This is a major achievement in the development of low-cost solar systems, and we will need many more of its kind.

STEM graduates can find jobs updating our Nation's infrastructure. Last year, the American Society of Civil Engineers rated the U.S. infrastructure as a D. This is unacceptable, unsustainable, and unsafe.

We need chemical and civil engineers to design, construct, and maintain streets, sidewalks, public transit, water supply networks, sewers, street lighting, waste management, public parks, and bicycle paths, just to name a few.

Professionals working on our Nation's infrastructure will also need skills in physics, electrical engineering, and urban planning. This is no small feat and will require the dedication of many new engineers. In fact, among engineering fields, civil engineering is expected to see the largest growth through 2018.

STEM graduates can help protect us from security threats. Plutonium or highly enriched uranium is used to build nuclear weapons. Vast quantities of this fissile material exists in the world today, some of it still unaccounted for, even though 260 tons of it has been secured over the last two decades under the Nunn-Lugar program. It takes less than 10 kilograms of plutonium or around 25 kilograms of highly enriched uranium to build a nuclear weapon, and several terrorist organizations have demonstrated interest in acquiring a nuclear weapon.

Consequently, we need nuclear engineers to determine how to secure these dangerous materials, detect nuclear threats at a distance, disarm potential devices, and respond and clean up after any explosion. Technical skills, in addition to various engineering skills, will be necessary to solve each of these dilemmas.

These are just a handful of the exciting and important job profiles that will be available to our Nation's STEM graduates. We will also need environmental engineers to provide access to clean water, mechanical and aerospace engineers to update our transportation methods, agricultural engineers to help tackle world hunger, and much more. All the surveys today say that young people want to "make a difference" with their lives, and certainly these STEM jobs will. But beyond the opportunity to make a difference, STEM graduates will also earn high salaries postgraduation. During our current economic times, this is no small incentive.

According to a recent survey by the National Association of Colleges and Employers, STEM majors account for the top five highest earning bachelor's degrees of those graduating in 2010. Specifically, engineering degrees accounted for four of the five most highly paid bachelor's degrees. Starting salaries for these graduates are between \$60,000 and \$75,000 per year.

Yet despite the various incentives, we are already behind in the number of scientists and engineers we will need to educate in order to fill the jobs of the future.

Between 1985 and 2007, the number of individuals receiving engineering bachelor's degrees fell by nearly 10,000. This precipitous decline occurred at the same time that the total number of undergraduate degrees rose by one-half million.

Moreover, employers are having a difficult time filling available engineering positions. Raytheon CEO William Swanson recently told the Greater Boston Chamber of Commerce that he plans to hire 4,500 engineers this year, but he finds it harder and harder to find them.

This trend must be reversed. Fortunately, organizations such as the American Society of Mechanical Engineers and the American Society for Engineering Education are working to "prime the pump" for the next generation of STEM professionals. To promote and improve K-12 STEM education, the American Society of Mechanical Engineers is fostering partnerships with educational groups such as the First Robotics Competition, the Junior Engineering Technical Society, Project Lead the Way, and the Girl Scouts and Boy Scouts. The American Society for Engineering Education has a publication called "Engineering, Go For It," aimed at inspiring students, particularly girls and underrepresented minorities, to pursue an engineering career. They also administer a number of undergraduate and graduate fellowship and internship programs, including several sponsored by the National Science Foundation and the Department of Defense.

This type of organizational support is critical to ensuring that students across the country have access to quality STEM opportunities in K-12 education and beyond.

In my remaining time in the Senate, I will continue to encourage my colleagues in Washington to invest in STEM education. It is true we have our partisan problems in Washington these days, but I believe there is bipartisan consensus on the value of promoting STEM education.

Support for STEM education is essential for our economic growth and recovery. It is the future of our workforce. It is our children's and our grandchildren's future.

Thank you, Mr. President. I yield the floor and suggest the absence of a quorum.

The ACTING PRESIDENT pro tempore. The clerk will call the roll.

The assistant legislative clerk proceeded to call the roll.

Mr. ALEXANDER. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

#### CONCLUSION OF MORNING BUSINESS

The ACTING PRESIDENT pro tempore. Morning business is closed.

#### FAA AIR TRANSPORTATION MODERNIZATION AND SAFETY IMPROVEMENT ACT

The ACTING PRESIDENT pro tempore. Under the previous order, the Senate will resume consideration of the House message to accompany H.R. 1586, which the clerk will report.

The assistant legislative clerk read as follows:

House message on H.R. 1586, motion to concur in the House amendment to the Senate amendment to H.R. 1586 with an amendment, an act to modernize the air traffic control system, and so forth and for other purposes.

##### Pending:

Reid motion to concur in the amendment of the House to the amendment of the Senate to the bill, with Reid (for Murray) amendment No. 4567 (to the House amendment to the Senate amendment to the bill), in the nature of a substitute.

Reid amendment No. 4568 (to amendment No. 4567), to change the enactment date.

Reid motion to refer the message of the House on the bill to the Committee on Appropriations, with instructions, Reid amendment No. 4569 (the instructions on motion to refer), to provide for a study.

Reid amendment No. 4570 (to the instructions (amendment No. 4569), of the motion to refer), of a perfecting nature.

Reid amendment No. 4571 (to amendment No. 4570), of a perfecting nature.

The ACTING PRESIDENT pro tempore. The Senator from Tennessee.

Mr. ALEXANDER. Mr. President, would the Chair let me know when I have consumed 9 minutes.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

Mr. ALEXANDER. Thank you very much.

The Presiding Officer is a distinguished former Governor, and I am a

former Governor. I suggested during the health care debate that anyone who voted for the new health care law ought to be sentenced to go home and serve as Governor for 8 years under the new law and try to make it work. People thought I was kidding. I was serious. The vote we are about to have this afternoon is another symptom of the same problem.

Here is what the vote today, which is characterized as being about teachers and Medicaid, actually does. It is a \$10 billion bailout to help States pay teachers, but it ties the Governors' hands so a Governor can't change education funding levels if their State budgets are in trouble, which almost every State is.

Second, there is \$16 billion for States to pay for Medicaid—the Federal program that is a combination of Federal money and State money—but, again, this ties the Governors' hands so Governors can't adjust the State Medicaid programs in a way that will make it possible for them to afford to continue to run the program. In other words, if you are the Governor of Tennessee, because of receiving this money or the stimulus money earlier, your ability to change benefits is limited and, in some cases, taken away.

Third, what we are about to vote on this afternoon raises taxes by about \$10 billion to help pay for these proposals. This \$10 billion in permanent tax hikes is on American multinational companies. That sounds like: Well, let's stick it to the company. But these are companies which employ 22 million Americans, according to the National Association of Manufacturers. This makes it harder for those companies to continue to employ people in the United States and it gives them more incentive to send jobs overseas.

Then there is the additional offset to this bill of \$3 billion in military and veterans funding cuts and, as the Senator from Kentucky has pointed out, these are very broad cuts, and there is nothing to keep these cuts from being made from the operation and maintenance of the fighting men and women in Iraq and Afghanistan.

Then the fourth problem with this vote this afternoon is it adds to the debt nearly \$5 billion.

The fifth problem is we are already spending—41 cents out of every dollar we spend today is borrowed from someone, creating a serious deficit problem. There is sometimes back and forth about who caused the problem, but the solution to a boat with a hole in it is not to shoot another hole in the boat and have two holes or three holes, and that is what we would be doing with this bill.

We would be extending the so-called fiscal cliff in the States by tying the Governors' hands so they don't do what they normally would do in down times such as this, which is reduce spending so they can make their way through it. We are raising taxes on companies in a way that could send jobs overseas. We

are adding to the debt. Those are all the things we are being asked to vote on this afternoon.

One might say that is a partisan comment I am making in describing the situation. I don't think so. I think it is the comment of someone with a background as Governor of a State who has consistently struggled with Washington's irresistible impulse to impose on States rules from Washington that may not fit States.

For example, the education money—the \$10 billion—has five strings on it. No. 1, we have to keep spending on K-12 education at least as high as last year's money.

Again, that sounds good, but if you are a State that is reducing and has less revenue, you have to reduce costs or you will have fiscal cliff after fiscal cliff. The same with Medicaid—\$16 billion more for Medicaid but, again, with restrictions on what States can do to change benefits. So, as a result, Governors and legislatures that have less State revenues continue to increase their spending on Medicaid. But guess what. Not on other programs such as public colleges and universities.

I am absolutely convinced the health care law and the new costs being tacked onto States to pay for an expansion of Medicaid is going to irreparably damage our public colleges and universities. It is going to hurt their quality because the money that should be going to colleges and universities is going to go to help pay for Medicaid requirements imposed from Washington.

Who else is going to be hurt? The students. I am sure the students protesting at the University of California the over 32 percent tuition hikes have no idea the reason they are having the hikes is because Washington keeps imposing new costs on State Medicaid Programs, causing Governor Schwarzenegger and the California Legislature to take money that otherwise most likely would have gone to the University of California and spend it instead on Medicaid.

Let me give a bipartisan twist to what I just said. There was a Wall Street editorial, written by Richard Ravitch in January of this year. He is the Democratic Lieutenant Governor of New York State. This is the way he describes this scenario we are being asked to vote on this year:

The Federal stimulus has provided significant budget relief to the states—

Mr. President, that was the money that was passed in the beginning of 2009 to try to create new jobs, which apparently hasn't worked so well since unemployment is still very high. He says:

But this relief is temporary and makes it harder for states to cut expenditures.

Just as this vote this afternoon will do so.

In major areas, such as transportation, education, and health care, stimulus funds come with strings attached. These strings prevent states from substituting federal money for state funds, require states to spend minimum amounts of their own funds,