

Secretary Chu: Help Save the World

US Department of Energy



Chancellor Mark Wrighton, the Board of Trustees, faculty, family, and friends here today, thank you for letting me share this wonderful day with you. It is a special privilege to return to the campus where my father began his career as a professor of chemical engineering.

To the new graduates: Congratulations on your achievements.

This year is the 40th anniversary of my own commencement. I know from personal experience that you will probably not remember what I will have said five years from today. I could stand here and read the phone book - except that you probably would remember that. On the other hand, some of you may not even know what a phone book is.

The dilemma of all commencement speakers is that we stand between you, your diplomas, and party time. In that respect I am like a corpse at an Irish wake: I'm needed for the ceremony, but nobody expects me to say much.

Nevertheless, it is the dream of every professor to say something that will trigger a student to go beyond what they might have done. Although I am now the Secretary of Energy, in my core, I will always be a professor. Nothing makes me happier or more hopeful than being around young students like you.

My take home message to you will be just one sentence. Actually, it will be just four words. We will get to those four words in a moment.

First, I want to set the scene.

At the time of my commencement, the Vietnam War was raging. America just invaded Cambodia. At Kent State a month before my graduation, four students were killed when the Ohio National Guard fired into a group of students protesting the war. In the weeks that followed, millions of students went on strike. Graduations were canceled.

During that time, the United States and the Soviet Union had roughly 50,000 nuclear warheads, with each warhead capable of more than ten times the destructive power of the Hiroshima bomb. Those nuclear warheads were poised to be launched at short notice to trigger a blinding flash of mutually assured

destruction.

In contrast to this turmoil, we had sent men to the moon in 1969, a mere 66 years after the Wright Brothers flew their first airplane. The first laser was demonstrated in 1960, and the first commercial integrated circuit was developed the following year. By the time I graduated, the seeds of the internet revolution had been planted and were beginning to sprout. In 1970, Norman Borlaug received the Nobel Peace Prize for introducing the Green Revolution that enabled Mexico, India and Pakistan to avoid mass starvation.

You are graduating at a time that is no less stressful, no less exciting, no less critical. We are recovering from the worst recession since the Great Depression, but the unemployment rate is still nearly ten percent. Many of you face uncertain job prospects. Our troops are in Iraq and Afghanistan, and science is telling us that our carbon emissions are changing our climate.

On the other hand, you, the Class of 2010, are the recipients of some of the best our society has to offer. You have been allowed to stretch your intellectual wings. You have been given the privilege to wonder, to think, to create. As the beneficiary of this opportunity, the question is "What will you do in the coming years?"

You may recall the movie, *The Graduate*, and the scene in which Dustin Hoffman is confronted by his father:

Mr. Braddock: Ben, what are you doing?

Benjamin: Well, I would say that I'm just drifting. Here in the pool.

Mr. Braddock: Why?

Benjamin: Well, it's very comfortable just to drift here.

Mr. Braddock: Have you thought about graduate school?

Benjamin: No.

Mr. Braddock: Would you mind telling me then what those four years of college were for? What was the point of all that hard work?

Benjamin: You got me.

You could drift around for years - and thanks to President Obama's health care plan, you would still be covered on your parent's health insurance! I urge you not to drift.

Here are my first two words of advice: do something. Pick something you care about, and give it your all. If it doesn't work out, move on. Even if you are successful in your career, don't be afraid to move on and explore new territory. Your biggest regrets will not be over the mistakes you made, but over the opportunities not seized. *Carpe Diem*.

When I was your age, I wanted to be a physicist and was an incredibly single-minded nerd. After college, my central focus and professional joy was doing physics. You may wonder why someone like me would ever consider leaving the life of a professor at Stanford to become the director of a national laboratory, or to leave academia to become Secretary of Energy. I can assure you I would rather be in a laboratory and working with students than just about anywhere else I can

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imagine.

During the 26 years I was at Stanford and Bell Labs, I don't think I ever took more than a 3 or 4 day vacation. The simple fact was I didn't want to take vacations. As I began my downward spiral from professor to administrator to bureaucrat in the last six years, I find I now need vacations.

Despite the trials and tribulations of running a large bureaucracy and being part of the political world, there's nowhere else I'd rather be. Why? Because I believe that the energy and climate change problem is one of the most pressing problems that the world has to solve. As part of President Obama's Administration, I can contribute to helping guide America towards a sustainable energy future.

So here is my full, four-word sentence of advice - the only thing you need to remember from my speech today:
Do something that matters.

I think the students and postdocs I mentored, and the research we did together mattered. But, sometime in the last ten years, I began to worry about climate change. While I'm not naturally an activist, the mounting evidence was becoming alarming. Some business-as-usual scenarios predict that there is a 50-50 chance that the average temperature will be at least 4 degrees centigrade hotter by the end of this century. This increase may not sound like much, but let me remind you that during the last ice age, the world was only 6 degrees colder. During this time, most of Canada and the U.S. down to Ohio and Pennsylvania were covered year round by a glacier.

A world four degrees warmer will be a very different place. More frequent heat waves and increased water stress in many areas of the world are predicted. Rising sea levels and the severity of hurricanes and cyclones will threaten low-lying coastal areas. The climate will change so rapidly that many species, including many poor people, will have a hard time adapting.

I was born in St. Louis and lived here until I was three years old. My only childhood memory of St. Louis was standing at a street corner, holding my mother's hand, on a really, really hot day. It's strange how one's memory works. When I was a child, weather records show that the temperature in St. Louis rarely reached 100 degrees. By about the time your grandchildren graduate from Washington University, there is a chance the temperature will be above 100 degrees for about 60 days each year.

The great American philosopher of the 20th century, Yogi Berra once said that "predictions are hard to make, especially about the future." With this caveat in mind, I will make two predictions. 1) In the coming decades, the price of oil will be higher, driven by the laws of supply and demand. 2) Climate change and its risks will become so starkly apparent that we will live in a carbon constrained world.

In order to meet the energy and environmental challenges we face, we will need nothing less than a second industrial revolution. The first industrial revolution supplanted human and animal power with machines powered by fossil fuel. Today,

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we use the power of two horses to dry our hair. We go to the local market under the pull of hundreds of horses, and fly across our continent with a hundred thousand horses.

A second industrial revolution is needed to provide the world's energy needs in an environmentally sustainable way. America has the opportunity to lead in this new industrial revolution and build the foundation of our future prosperity. Alternatively, we can hope that the price of oil will return to \$30 a barrel and that climate change is not a serious threat. If we are wrong, we will be importing the new energy technologies developed by Europe and Asia.

When the great hockey player, Wayne Gretzky, was asked how he positions himself on the ice, he replied: "I skate to where the puck is going to be, not where it's been." America should do the same.

President Obama is committed to comprehensive energy and climate legislation that will position America where the puck is going to be. This legislation should provide the right incentives for America's inventors, entrepreneurs, and industries to transform how we use and produce energy. Ultimately, it is the American people that must demand that their elected representatives pass laws that will guide our country to the future.

In my day, the students of America were at the vanguard of our country's disengagement from Vietnam. I look to you to engage America to solve the energy and climate problem. It will be your idealism that can give our elected officials the ammunition to overcome the resistance of those who are easily frightened of the future, and want to cling to the status quo. It will be your intellectual courage and creativity that will find the technical and policy solutions we need.

I believe there will be Nobel Prize winning discoveries in the solutions to the energy challenge. The development of successful green energy technologies will create personal wealth, new jobs, and will be a cornerstone of America's future economic prosperity. Although the prospect of reaping rewards in meeting the energy and climate change problem is a great motivator, for me, the bottom line is that this challenge is a deeply moral issue.

Climate science has presented us with a dilemma that civilization has never had to face. We have to confront the possibility that our actions are placing future generations at serious risk. While scientists cannot predict with certainty that a climate catastrophe will occur, are we willing to take these risks?

Deeply rooted in all cultures, is the notion of generational responsibility. Parents work hard so that their children will have a better life, but are we willing to invest our money to protect people we will never know? One of the cruelest ironies of climate change is that is that the ones who will be hurt the most are the most innocent: the worlds poorest and those yet to be born.

In my final comments, I want to leave you with an image captured by Voyager 1 in 1990. As the spacecraft began to leave our Solar System, the astronomer, Carl

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Sagan, convinced the NASA engineers to turn Voyager for one last, homeward look. In this picture, Earth appears as a pale blue dot of light, one tenth of the area of a single pixel and embedded in a rainbow of light scattered from the camera lens.

Here is a condensed version of what Sagan wrote about this picture:

"Look again at that dot. That's here. That's home. That's us. On it, everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives .. Every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, . every saint and sinner in the history of our species lived there--on a mote of dust suspended in a sunbeam.

"The Earth is a very small stage in a vast cosmic arena ..Our posturing, our imagined self-importance . are challenged by this point of pale light. Our planet is a lonely speck. in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves.

"The Earth is the only world known so far to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand.

"It has been said that astronomy is a humbling and character-building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known."

To this narrative, I add a Native American saying about how we should care for our planet, this pale blue dot of light. "Treat the earth well: it was not given to you by your parents, it was loaned to you by your children." My generation is in danger of breaking this sacred trust. Hold us accountable.

I promise you that your next 40 years will rush by in a blink of an eye. When I graduated, I thought I was immortal. Today, I know that if I am lucky, I will have only one fifth of my life yet to enjoy. I was told last night by one of my fellow honorees that I am still young. Youth, like beauty, is clearly in the eye of the beholder.

I am proud to share this podium with my fellow honorees. All of them have done something that mattered. When you are old and gray, and look back on your life, you will want to be proud of what you have done. The source of that pride won't be the things you have acquired, or the recognition you have received. It will be the lives you have touched and the difference you have made. Nothing will give you greater satisfaction.

Congratulations to the class of 2010. You have an extraordinary role to play in shaping our future. Here is my final advice in three easy steps.

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First: Receive your degrees.

Second: Go out and celebrate. The great economist John Maynard Keynes' dying words were, "I should have drunk more champagne." Don't make that mistake. Celebrate with champagne.

Third: Do something that matters. Help save the world.

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