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ON GROWTH THROUGH INNOVATION

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PARTICIPANTS:

Welcome and Introduction:

STROBE TALBOTT
President, The Brookings Institution

GLENN HUTCHINS
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PANEL 1: THE SHIFT TO AN INFORMATION ECONOMY

Moderator:

DARRELL WEST
Vice President and Director, Governance Studies
The Brookings Institution

Panelists:

JEFF BEWKES
Chairman, President and CEO
Time Warner

RANDALL STEPHENSON
Chairman, President, and CEO
AT&T

JULIUS GENACHOWSKI
Chairman, Federal Communications Commission

PANEL 2: THE POTENTIAL OF GREEN ENERGY AND TECHNOLOGY

Moderator:

BRUCE KATZ
Vice President and Director, Metropolitan Policy Program
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Panelists:

JEFF IMMELT
Chairman of the Board and CEO
General Electric

STEVEN “MAC” HELLER
CEO, Coda Automotive

MICHAEL GREENSTONE
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Moderator:

PETER SINGER
Senior Fellow and Director, 21st Century Defense Initiative
The Brookings Institution

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DAVID COTE
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Honeywell

MICHAEL O’HANLON
Senior Fellow and Director of Research, Foreign Policy
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WALTER HAVENSTEIN
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Moderator:

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Panelists:

ALICE RIVLIN
Member, National Commission on Fiscal
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ANN FUDGE
Member
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THE HONORABLE EDWARD RENDELL (D-PA)
Governor
Commonwealth of Pennsylvania

THE HONORABLE EVAN BAYH (D-IN)
United States Senate

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Moderator:

MARTIN BAILY
Senior Fellow
The Brookings Institution

Panelists:

KLAUS KLEINFELD
President and CEO
Alcoa

DOMINIC BARTON
Senior Managing Director
McKinsey and Company

AUSTAN GOOLSBEE
Chairman, Council of Economic Advisors
Chief Economist, President's Economic Recovery Advisory Board
The White House

PANEL 6: THE POLITICAL AND POLICY ROAD AHEAD

JOHN L. THORNTON
Chairman, Board of Trustees
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VALERIE JARRETT
Senior Advisor and Assistant to the President for
Intergovernmental Affairs and Public Engagement
The White House

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P R O C E E D I N G S

MR. TALBOTT: Good morning, everybody. I'm Strobe Talbott and it's my pleasure to welcome you all here for the third forum in a series that we've been running here at Brookings under the general topic of Growth Through Innovation. The first two forums that we held were private, but we felt that the group that is assembled here and has been the core of the effort has become sufficiently cohesive and enough themes have begun to crystallize that it's time to go public with this venture, first because we feel there are some ideas here that are important to put into public debate and also we feel it's particularly timely to have a public forum more or less at the same time that the new Congress is coming into office.

What we call Growth Through Innovation, or GTI, is an all-Brookings priority. And what I mean by that is that it is intended to address a challenge facing the nation that requires focus and input from all of our research programs here at the institutions, which is to say we're drawing on expertise across disciplinary lines. Just to put in context, the other three all-Brookings priorities that we have are: first, one on how to design and bring about an energy future for this country and indeed for the world that makes both economic and environmental sense; second, we have an all-Brookings priority on how to ensure that our economy, our government policy, and our society are capable of providing maximum opportunity and wellbeing for our citizens; and then the third all-Brookings priority is managing global change.

The premise of GTI is, I think, inherent in what the initials stand for, namely that in order to be sustainable growth needs to be based on innovation, and that means new ideas, new strategies, new technologies. It also means new ways of investing while, at the same time, restoring fiscal sanity to our nation. And it means unleashing or perhaps I should say reviving the American knack for invention of products, techniques, and competitive strategies.

As in the previous two forums, what we will be doing during the course of today is bringing together Brookings experts with public officials, representatives from the private sector, and opinion leaders. We're going to have a series of conversations that are going to be anchored by some of my colleagues here at the Institution.

On the issue of the information economy Darrell West is going to be the anchor. He is the vice president and director of our Governance Studies Program and also the founding director of our new Center on Technology Innovation.

On the subject of clean, green energy we'll be hearing from Bruce Katz, who will lead that discussion. Bruce is the founding director of one of our five research programs on metropolitan policy.

On the question of defense industries we'll be relying for leadership on Peter Singer and Mike O'Hanlon, who lead our 21st Century Defense Initiative.

On innovating public institutions the anchor will be Bill Antholis, who is the managing director of Brookings and also a senior fellow in our Governance Studies Program.

On manufacturing we'll be counting on Martin Baily, who is the head of our Initiative on Business and Public Policy.

The event will conclude with a conversation between the chairman of our board, John Thornton, and Valerie Jarrett from the White House.

In just a moment I'm going to turn this over to Glenn Hutchins. Glenn is a trustee of this institution. He served on the National Economic Council in the 1990s at the White House. He is a founder of Silver Lake Partners, a private equity firm that specializes in technology. He has been instrumental in conceptualizing this series of forums and bringing them together. And I want to thank him as well as his co-chairs of this whole enterprise who are also trustees: Dominic Barton, Steve Denning, Ann Fudge, Klaus Kleinfeld, and, of course, the chairman of our board, John Thornton.

So Glenn, over to you.

MR. HUTCHINS: Good morning. Our goal today is to discuss how we should think about a plan for national economic competitiveness. In particular, we want to address whether in an era of both intense political partisanship and a yawning divide between government and business we can conceive of nonpartisan approaches --

this is a word you hear a lot at Brookings -- to our common problems.

We hope to chart a means for political leaders, both state and local, both liberal and conservative, to work constructively in partnership with industry to foster economic growth and job creation. Our key premise, if past is prelude to the future, is that innovation is the vital spur to growth and prosperity, and we fear that the U.S. risks losing our comparative advantage as the epicenter of global innovation.

Today we've assembled an extraordinary group. I was (inaudible) Brookings. There was -- Jack Kennedy once said that there hasn't been such a group -- when he had a Nobel Prize and it was at the White House and he said there hadn't been such a group assembled there since Thomas Jefferson dined alone. And I think we have a similar kind of experience here today at Brookings.

We have assembled an extraordinary group of leaders from the private and public sectors to explore these questions. They come from some of our most important industries: information technology, communications media and entertainment, manufacturing resources, defense and green technologies, and so on.

We also have with us today public policy leaders who have grappled with some of our most difficult public policy questions and, looking at Ann and others, have the stars to show for it.

The economic problems we will discuss today are manifest and urgent, but not susceptible to quick solutions. In fact, economic historians warn us that in the aftermath of debt-fueled bubbles countries often experience persistently high unemployment and low growth for a decade or more. To avoid that fate we must work in earnest to construct ways to put the millions and millions of unemployed and underemployed Americans back to work. That means we have to devise innovative solutions, strategies to elevate our nation's economic output to its potential, which some of our economic experts around here tell me is as much as a trillion dollars more than we have today. It seems clear that this must be driven by innovation at all levels; by advances, for instances, in basic science, technology, industries of the future, process efficiencies, revolutionary business models, as well as -- and this is very important -- supporting innovations in capital formation, the delivery of public services, and approaches to institutional governance.

The dimensions along which we need to work are really quite straightforward and we intend to ask each panel today how public policy solutions can be implemented in their respective sectors. They included issues and areas which cutting-edge research is done every day here at Brookings and reflects the many components of U.S. competitiveness. The list actually, it goes on and on. I would like to share it with you. It's meant to be interminable: education; research and development; immigration; fiscal balance, federal, state, and municipal; health care cost control; entitlement reform; trade reform; tax reform; labor market initiatives; persistent poverty issues; metro area initiatives;

governance reform; capital to lend and invest; and, most important of all, fostering innovation.

We're frequently advised by political operatives -- and I see some of my friends who are experts in these subjects out here today -- that partisanship and paralysis mean that thoughtful solutions to these critical problems are simply not possible. We find that mindset unacceptable. In contrast, we believe that Americans are prepared to meet these challenges and those assembled here today are more than ready to do their part.

We're also often told that industrial policy or picking winners is folly in a market economy. That misses the point. Every high-growth country in the world -- many businesspeople here, like me, spend a lot of time in those parts of the world -- is implementing a carefully conceived, long-term plan to create the conditions for national economic competitiveness and the resulting prosperity. Right? Absolutely right.

This does not at all mean -- Dominic's here, the head of McKinsey's here nodding his head, so that's pretty good. McKinsey's the -- I feel like I've already been validated. Thank you, Dominic.

This does not mean at all tampering with the market's allocation of resources. Rather it means creating a foundation upon which markets can function and business can thrive.

As Strobe mentioned in his opening, this is the third in a series of meetings that Brookings has convened bringing together thought leaders from the private and public sectors under the banner Growth Through Innovation. The first of these two sessions were smaller brainstorming session with Brookings scholars, businesspeople, and policymakers that explored a range of these issues. Today you'll hear Brookings scholars talk about some of the work that these discussions have inspired as they moderate conversations with corporate leaders and public officials. In fact, I'm happy to announce today that two policy briefs that have been produced as part of this effort are being released today: one by Darrell West -- I saw Darrell earlier -- one by Darrell West and one by Martin Baily. Where's Martin? Martin's, I know, here somewhere. Martin's in the back, voila.

Both touch on a topic central to restoring U.S. competitiveness and innovation technology skills transfer. Darrell's paper recommends moving from a family's first to a text skills first immigration -- visa policy, pardon me. Martin's paper offers complementary recommendations for increasing manufacturing in the U.S., and we have a few people here today who know just a tad about that subject. These are important papers and I hope we'll hear about them today.

In addition to the Brookings scholars whom Strobe just introduced, I'd like to thank the corporate leaders here today who braved the weather to attend, though it was a little bit of a paper tiger, at least in Washington. But I do -- a number of people got out of their respective cities earlier to get here and we do appreciate the effort people made to get here today.

This combination of research, private dialogue, and public discourse is what makes Brookings very, very special and which makes me very proud and pleased to be associated with it. But Brookings is also uniquely capable of creating a forum, like today, where partisan political differences and commercial self-interests can both be set aside in pursuit of the common good. I'm happy to assure you that this work will continue following today's session. The Growth Through Innovation team will incorporate today's conversation and follow-up discussions in a strategy paper for national competitiveness and innovation in the near future. We look forward to sharing that with you.

In closing, many have argued that our problems are the -- today's problems are the culmination of a generation of both the accumulation of debt broadly defined and the neglect of basic investments in almost every sector of our society. And if so, the solutions could well require decades of remediation.

To most people this challenge seems just too daunting. To many this challenge seems just too daunting. Why not, as they say in this town, just kick the can down the road? To business leaders, though, that means we must act with a sense of urgency and resolve, so let's get started. (Applause)

MR. WEST: Okay. Thank you, Glenn. And before we start I'd like to acknowledge Glenn's leadership on this innovation issue. It was actually his suggestion that Brookings launch this forum on Growth Through Innovation and he has helped to make it an amazing success. Each conference that we have put on has gotten better and better. We appreciate all that he has done in emphasizing innovation and highlighting the challenges facing our country.

And, as a side benefit, we have also discovered that when we are really nice to Glenn, he's willing to show us his Boston Celtics Championship ring. (Laughter) And I tell you, it is a really nice ring. Even my wife is impressed with that piece of jewelry, so.

For those of you who don't know me, I'm Darrell West, vice president of Governance Studies and director of the Center for Technology Innovation at Brookings. And I'd like to welcome you to this session on the information economy.

Strobe and Glenn have emphasized and explained the rationale for our program today and the importance of innovation for long-term economic development. There's little doubt that innovation is the key to American prosperity. It's one of the reasons the United States thrived after World War II and in following decades. With Congress back in session now all eyes are focused on how to improve the economy. Now, that clearly is the central issue facing our country right now. We all need to figure out ways to remain competitive and facilitate future innovation.

These are some of the reasons why Brookings last May launched our new Center for Technology Innovation. Our mission is to analyze the drivers of innovation and to enhance public, media, and policymaker understanding of technology innovation. We have undertaken research on digital media, health information technology, education technology, and public sector innovation, among other subjects. We work closely with the White House, members of Congress, and the private sector to determine what policies are needed and how to promote best practices in the public and private sectors.

In our research we have found that technology innovation is crucial for economic development. This area is one of the few industries experiencing double-digit growth, so if we want to get back on track, we need to strengthen our information economy. That is the platform for future progress in areas such as education, health care, energy efficiency, and mass entertainment. To help us understand the information-based economy we are pleased to welcome three distinguished leaders to Brookings.

Jeff Bewkes is chairman, president, and CEO of Time Warner. Mr. Bewkes oversees Time, Incorporated, HBO, CNN, TNN, TBS, and Warner Brothers, among other parts of the company. Previously he served as chairman of the Entertainment and Networks Group and chairman and CEO of HBO. You see him regularly in the news offering his views on the industry and the future of television. Last fall, he wrote a widely quoted column for the *Wall Street Journal* with the very provocative title of “The Coming Golden Age of Television.” You know, everybody thinks it's the Internet. He thinks television.

MR. BEWKES: It's the same thing. (Laughter)

MR. WEST: Good point. Goddamn, I hate to be upstaged by my panel members so early in the event, but he's exactly right. (Laughter) But he does have tremendous insights into how innovation takes place.

Randall Stephenson is chairman, president, and CEO of AT&T. And as all of you know, AT&T is the world's largest telecommunications company. As chairman he has strengthened AT&T's position as a leader in mobile broadband and global IP data. AT&T invests around $18 billion each year to upgrade broadband and bring wireless service to people around the country.

MR. STEPHENSON: Closer to 19.

MR. WEST: Closer to 19, excuse me. A billion here, a billion there. AT&T is launching its new 4G LTE -- Long-Term Evolution -- service and also is the carrier for Apple's popular iPhone. The digital infrastructure that AT&T and other telecommunications companies have built made possible the new services that are coming online. So there obviously are lots of amazing innovations taking place in health care, education, energy, entertainment, and communications, and Mr. Stephenson is right on the frontlines leading to that innovation.

I'm about to introduce our third panelist. I've already been corrected on the first two, so I do this with great trepidation. (Laughter)

But Julius Genachowski is chairman of the Federal Communications Commission. The FCC is focused on broadband challenges, job creation, and economic development. Prior to joining the FCC, Mr. Genachowski chaired Candidate Obama's Technology, Media, and Telecommunications Policy Working Group.

He has extensive experience in the private sector. He was chief of operations at the Interactive Corporation and co-founder of LaunchBox Digital and Rock Creek Ventures. So we're delighted to have him with us here today as well.

Our format will be as follows: I'm going to start with a few questions for our panel, we'll have a little bit of a discussion among ourselves, and then we will open the floor to any questions and comments that you have.

So we'll start with Mr. Bewkes. There's been a flowering of media and entertainment content providers. This has shaken up the industry and produced new players, vigorous competition, and new business models. Can you tell us what competition means in your industry and how it enables innovation?

MR. BEWKES: Sure. I don't want to change the mood because it was a very serious and uplifting beginning, but we're in the middle of a period of huge success and innovation in the media business. I think the easiest way, because media's pretty big, is to look at television. And we all know that the television screen, the television business ahs been with us for a long time. You used that phrase it's either a Renaissance or a second Golden Age. Obviously the first Golden Age was when it was invented and it had this transformative effect on life, not just in the United States, but all around the world. And I think if you think back, the advent of TV in the United States was really the most vigorous and the one that served as a template for what then happened in the rest of the world. That's happening again and has been underway for at least 20 years.

And so if you think about the -- we'll do objective measures first and then subjective ones, and then you'll all be the judge. Objective measures: the ratings, the viewership, the earnings, the programming investment, the number of channels, the type of diversity of subjects that are on television every day, 24 hours a day, is more vital, healthy, every indicator up, including financial indicators, to this minute, every quarter without change. If you go away from objective measures in the TV industry to subjective measures, and you ask yourself what do you see in the quality of what's on? What do you see in the diversity of not only the subject matter, but the type of programming, the genres of programming, the mix between mass audience appeal efforts versus targeted appeals that may be of interest to you. We all know 20, 30 years ago, you couldn't find that on TV. It didn't work that way. It was a mass, low common denominator industry. Not true today.

And so if you move then from the range and precise quality and focus of all the different kinds of TV shows that are on the air and absolutely a measurable dramatic increase in the money being invested in this program. Look at the talent, the directors, the writers, the actors that you used to associate with the big screen, they're working on television now and they're doing work that you can't do on the big screen because of the commercial nature of the film business, which I won't dwell on unless someone wants to ask a question about it.

So you have all this going on on the quality and health side. If you look around the planet, basically this system of an explosion of channels and different types of programming is being duplicated and created. The American development is being quickly implemented all around the world, so you're looking at the first point at a very healthy industry that's very connected to the citizens' lives everywhere.

That goes hand-in-hand with something I think Randall's going to talk about, which is the -- you can't do any of this without a very healthy, well-funded infrastructure that can bring you hundreds of channels. It can bring you high definition; soon it'll be 3-D. Increasingly it will be the delivery of all this kind of programming on every screen you have, which is why the Internet and TV are the same thing because there's no difference between your TV screen -- it's got a glass front; you all know what it looks like -- and a smaller one called your laptop and a smaller one still that's portable that's your handheld device. These are all the same thing.

And so it's extremely important. Randall just said 19 billion a year and that's just AT&T. The amount of money put in in the United States in broadband road construction -- think of it like roads -- or all over the planet in this infrastructure capability is very important. It's a huge source of innovation. It, of course, has side effects in terms of education, low barriers to entry for people to come in over that system and create new programming forms.

And that industry, as it puts in the money to create that capability, now you have hand-in-hand the media let's you use the television channels industry. And the infrastructure industry that brings you your video and your broadband all together bringing you the next thing, which is all the programming you want on demand. You pick it, get it when you want, put it on any screen you want, and don't pay anything extra for them. Now, that's a business model. There are other models where you pay extra show by show, where you pay for other subscription providers.

But the point of it is, and then I'll stop, there is a huge vitality in competition and innovation that's occurring now in the intersection of Internet and television, which is basically accelerating. And I think to the point that Glenn asked at the beginning, it's a Brookings subject, what is the best way for public policy in the United States and around the world -- because they look at what we do -- to foster a good intersection or public square where this innovation can continue to take place. Because it's working very well as it is.

MR. WEST: Okay, you mentioned infrastructure. That provides a nice transition to Mr. Stephenson.

AT&T is investing billions in broadband and wireless infrastructure. What do you see as the biggest obstacles to continue innovation and job creation in your industry?

MR. STEPHENSON: Obstacles. When I think of job creation that's been the topic over the last couple of years and I think of public policymakers. Everybody said it ought to be about creating jobs, and I -- you listen to Jeff talk and it makes it even more apparent that jobs are kind of a byproduct. Jobs are not the target themselves. Jobs are a byproduct of investment. Innovation is a product of investment. In fact, if you do your correlation coefficients, the highest correlation coefficient to jobs is capital investment.

And so I step back and say if you want to create an environment for innovation and an environment healthy for jobs, you have to create an environment that's very attractive for investment. And so from a public policy standpoint, when I think about what does that environment look like, one of the triggers you can pull to drive investment, thereby jobs and innovation. I mean, it's -- you'd be disappointed if a businessman didn't stand up here and say tax policy is obviously one of the greatest drivers of investment, and regulation being another one.

And tax policy is kind of front and center from my standpoint.

You know, if you want more of something, you know, what should be your tax policy? You tax it less. If you want less of it, you tax it more. We do that with tobacco and alcohol: You tax it so you don't, you know, generate as much consumption. And it was maddening, you know, to me coming up the last part of last year, somebody who invested 19 billion a year, as we were headed towards this cliff of driving up capital costs dramatically: dividend taxes, capital gains taxes, accelerated depreciation, you know, all these things going away. They ultimately got put in and I commend the administration, I commend Senator McConnell for getting this put in place, and it brought some stability. It kept capital costs down. It allowed us to continue investing at the same pace we're investing, but those are -- I can't tell you how critical those are from an infrastructure provider to continue to drive investment and to drive job creation in all these media that Jeff was talking about.

The next, and I would say just as important, is regulation. And regulation affects capital costs in that it can create uncertainty. And so when I think of how our environment is regulated and you heard Jeff talk about what's going on, we are, as a company, AT&T, and I would even suggest as an industry, we are almost at full investment capacity. I don't know that we could put much more capital away than we're putting away at this time in the industry. And so regulation is one of those things that sticks its head up, and obviously uncertainty is one of the greatest drivers of capital costs as well.

That's why we worked very aggressively. I take my hat off to Julius and his team that we were able to come to a place on how wireless and the Internet is regulated, but Julius would know I was lying if I said I was totally pleased with it. But, look, it's a place where we know what we have. It accomplishes two variables: you know, I always say regulation needs to be fair and it needs to be consistent. And the capital investments we made, they're multi-billion-dollar bets that we made every year and they are multiyear investments. They're 10-, 15-year horizon investments.

And so making these capital outlays when you don't know 5, 10, or 15 years how they're going to be regulated, how you can price services and deliver services. That's a big deal to us. So working towards an end where, you know, we didn't get everything we'd like to have had. I'd like to have had no regulation, to be candid, but that wasn't going to happen, obviously. (Laughter) But we've landed at a place where we have line of sight. We know what we have. We can commit to these 10- and 15-year horizon investments.

And I'll finish by just saying -- a proof point, if you will -- is we have these tax policy changes put in place right before the holidays; we have these regulations and these rules that are better defined coming into the holidays; it is not a coincidence that we stepped up last week and said we're pulling all of our 4G investment forward. We're accelerating all of that to take advantage of these tax policy changes and, again, we'd have some clarity, some line of sight in terms of how these investments will be regulated. So I think those are very critical and those are the two elements from an investment and infrastructure standpoint that I think are most important.

MR. WEST: Okay. Mr. Genachowski, a year ago the FCC released a National Broadband Plan with an ambitious agenda for innovation in education, health care, energy, public safety and spectrum, among other areas. What do you think are the most important public policies for encouraging innovation?

MR. GENACHOWSKI: Well, let me start off, if I could, by telling you about what I saw last week at CES. Right? So the Consumer Electronics Show is one of our big annual showcases for innovation, technology investment, and I noticed two things this year that are worth pointing out.

One, if someone went to CES 20, 30 years ago, it also was a big showcase for innovation and investment, but almost all the devices would have been built on a platform of electricity. Electricity was this incredible platform for innovation, it lead to TVs and radios and ovens and one of the reasons we led the world in economic growth in the 20th century.

Well, today, all of the incredibly cool gadgets, devices, products that I saw at CVS were connected, in addition to electricity, to our information grid, connected to the Internet, wire to wireless, everything there. If you shut down the connectivity, you would have shut down CVS.

So that's point number one.

Point number two is I think that in the past the typical -- almost all the products at CES would have been the consumer products that we buy around the holidays. Nothing wrong with that.

SPEAKER: It's a good thing.

MR. GENACHOWSKI: A very good thing. But -- and this is rough and we'll ask the folks at CEA exactly what the statistics are, but I noticed two things this year. One, more and more products that go to business productivity, in addition to home entertainment, and more and more products that are part of vertical economic categories that matter because of opportunities for economic growth, but also because of the social benefits, like health care, energy, education.

And to me, the reason I start there is because it really illustrates what we have been trying to accomplish around broadband. Everything we're doing is built on the premise that making sure we have a world-class infrastructure in the United States for wired and wireless broadband is what is essential to the kind of innovation that both of the companies that are up here are working on, the many other companies that are working on it. And you do see a tremendous amount of innovation and a tremendous amount of really exciting things going on, attracting a lot of investment, opening up new markets.

To your question about what the policies are that we're working on, there are some challenges to this great story that we're worried about. You know, one at CES was illustrated by what happened if you tried to get on Wi-Fi or even if you tried to, you know, make a mobile call around the convention center. And, you know, congestion was pretty high, spectrum was being very heavily used, and a lot of people there had pretty frustrating experiences. And the tell there is the products that these companies and others are generating that are causing consumers to put so much more demand on our spectrum infrastructure -- smart phones, tablets, it's just incredible, it's all great -- it's dramatically outstripping the supply of spectrum that we see online at the FCC. No, I don't have a secret drawer with a lot of spectrum that I can just put it out. And so we'll come back to it, but I think that's a challenge that notwithstanding what I think right now is a leadership position when it comes to wireless and wireless innovation in the country, and also longstanding leadership around television-related innovation is something that could hold us back; other countries aren't waiting around.

Another major policy area that we're working on -- and I can come back and talk about any of these -- we continue to have policies in the country that made sense in a communications era that was dominated by old telephone service that don't make as much sense in an era that's broadband. One example is something called the Universal Service Fund. Programs spend several billion dollars a year, has done really a terrific job of connecting people around the country to telephone service. It still wakes up every day and supports connecting people in rural areas and others to telephone service. Well, that doesn't make any sense. We have to transform it, modernize it to apply to broadband. We have to look seriously at a whole bunch of wasteful, inefficient, not particularly smart policy pieces that have become part of the program over the years.

It's going to be more expensive to support broadband in rural America. We have to do it not spending any more money than we are now, which means we have to cut and be smarter about the program that we have. It's tied up. This is a level of detail that'll probably be not interesting to many of the people, but it's tied up with another program called Intercarrier Comp. The point is right now this whole system is creating the opposite incentives in many ways of what we would want. In some cases it's discouraging companies from going from circuit-switched communication system to all IP digital packet switched systems. We have to tackle that third thing.

We have to continue to look at barriers to investing in our communications infrastructure, wired and wireless, so that -- while Randall may be at the peak in terms of his investment capacity, not everyone is. A big part of our job is catalyzing more and more private investment and then having that investment go further. And so there are a whole bunch of areas, the kind of blood-and-guts of communications infrastructure -- tower sighting, pole attachments -- that are not particularly thrilling, but that together I think can make a difference in catalyzing more investment and then getting those investment dollars to go further, that is for the same, you know, dollar you get two towers up instead of one tower up. If we can reduce red tape, if we can reduce barriers, reduce inefficiencies to cause that to happen, all of those things together will put us in a much stronger position vis-à-vis the rest of the world at a point in time where there's clearly global competition going on in these areas.

MR. WEST: Jeff, in your various public statements you've talked extensively about a TV everywhere strategy, regardless of platform: TV, the Internet, tablets, mobile devices. What does this proliferation of platforms mean for future innovation? And how should the government alter its regulatory approach in light of the emergence of new platforms?

MR. BEWKES: Before we answer that I just have to say this must be a good Brookings session because if we're talking about tower sighting and pole attachments -- (Laughter)

SPEAKER: I'm getting teary-eyed over here, Jeff.

MR. BEWKES: (inaudible) on the ground.

MR. WEST: Yes, it's a public policy these days, cell towers.

MR. BEWKES: So all of these -- we don't know much -- and I guess, Randall, you should talk about the spectrum issues and how you can interact and help the policy, particularly in rural areas; we don't do that. All the content companies -- and this is true whether it's television, magazines, whatever it is -- we're basically putting out the content on the theory, and this is now accepted by I believe every media company and every connection company -- telephone, satellite, cable -- if you have paid for a magazine, if you have paid for a television network, if you have any economic relationship with any of those pieces of content, and you used to get it as a TV channel or a scheduled TV channel or as a magazine, this concept is you can now have it for free, no extra payment, on any device connected electronically. And it basically works on demand, so that if you want to watch whichever show isn't scheduled tonight, but it was on last night, you can do that. Any of you that have HBO today can do it now, so you can see that future now. And it would be no charge across all devices.

The same thing with magazines. So if you were reading *Time* magazine, you can do this on an iPad right now. If you have -- *People*, I'll use *People* as the biggest magazine in the world. And if you have a subscription to People magazine and you have a tablet device, including an iPad, if you're a subscriber, the thing is coming to your house, you turn on your -- light up your iPad, push the *People* icon, you'll be reading *People* for free with moving pictures. And if you want to read deeper into a subject that was published in another issue, you can do that, too.

So what you have, whether it's television, magazines, frankly any kind of content, is a business model that simply uses all of these advances without changing the wholesale or distribution structure, at least not initially, and that doesn't require consumers to make a payment or deal with another entity. And the aim is if you think about your relationship to any TV network or magazine, something you know how to use -- you want to go watch CNN or Discovery Channel -- it should work the same on every screen on every device. It should all be on demand. You shouldn't have to pay differently. You shouldn't have to do anything. And that's basically a massive innovation that takes this industry, which I started out by saying the ratings, the economics, the programming, all at the top of wherever they've ever been, and it makes it more useable at no extra charge. So it's a good deal.

Now, there are certainly issues as we go along of how does the economic prospect of that go forward? You have cable packages that you pay for. You may want to discriminate more in terms of what you get. Most people -- or a lot of people are paying more every morning for coffee than they're paying every day for all of this media choice. And the one thing I would say on behalf of the media business and the tech business is that there is an idea, which I hope you take it as a joke, it's kind of an un-American idea, which is that, you know, the new -- let's use the new content in a way that's good enough. It's good enough to have an inadequate selection on your broadband screen, one that's less complete than the one on your television. It's good enough to have it with bad resolution, no high-def, and no 3-D, and not that much on demand, and with latency. No, it isn't good enough. That is not how we got in any of these industries to the leading position in the world.

So let's think about what we always think about in this country: the highest quality, the biggest innovation, the widest availability, the most freedom of choice.

MR. WEST: So, Randall, you know, Jeff has mentioned the emergence of smart phones, tablets, high-definition video, and new wireless applications in a variety of different areas. What would you like to see in terms of spectrum policy, regulation, or other policies to further these new technologies?

MR. STEPHENSON: Well, Julius said it best. If you want this world, Jeff just articulated, to be a reality and a reality at a reasonable price point so the consumer can take advantage of all this, the one brick wall we're looking at is spectrum, availability of spectrum. And to put this into perspective, you know, the world Jeff is articulating, you know, I think it was maybe five years ago we first started talking about a three-screen strategy, you know, and the people that listened said, oh, that sounds really great and would kind of nod and go on. That's a reality today. What Jeff articulated we offer today the product that we sell called U-verse, a TV service. I can get this service on my iPhone. I have it on my iPad. That programming is available to me in all of those formats and all those medium, so it is there. What will keep us from proliferating this, you know, broadly to the entire consumer base is spectrum.

All of this -- you know, the bandwidth in wireless is this airwaves -- these airwaves, this spectrum. Over the last three years, if Julius will approve this last transaction we just did with Qualcomm, we'll have spent $11 billion just on spectrum. And we still see the end of the spectrum that we have in our portfolio now. And we -- maybe 3 or 4 years ago, our pattern was we'd go through 10 megahertz, a block of this spectrum, every 4 or 5 years. Today, thanks to the iPhone, the iPad, this content of Jeff's that we're streaming to all these devices, we'll burn through that in about 10 months today. So you can do the arithmetic and see just how quickly the spectrum is being consumed and utilized. This is why Julius and I, we -- he talks about it all the time, I talk about it all the time, that we have got to do something to free up more spectrum, get more spectrum into the hands of operators and so forth.

What does that process look like, Darrell? Julius and I would probably have a difference of opinion here. Go figure, right? But, you know, I just -- I always believed the markets ought to work, let the free markets work. And so I think auctions and so forth tend to be the most efficient way to ensure Treasury gets the most value for the dollar out of these and then allocate the spectrum that way. I understand there are other public policy issues, but to make this world that Jeff is framing a reality, this is the one issue that will be the constraint as we move forward in the next five years.

MR. WEST: Okay. Julius, both Jeff and Randall have highlighted this spectrum issue. What are you doing about it?

MR. GENACHOWSKI: Well, I actually think this is an area, coming back to where Glenn started, where there's the opportunity for a smart, nonpartisan, market-based approach to deal with our country's spectrum needs. As I said before, we don't have a lot of spectrum just sitting around. In fact, let me just sort of give you some numbers to backup what Randall was saying.

The amount of spectrum that the FCC has kind of based on a status quo pipeline to put on the market for mobile broadband represents about a threefold increase over what's available now, which sounds pretty good until you see the numbers that, you know, Randall knows better than I do. But over the next five years, the data demand on our spectrum coming from smart phones and tablets, you know, because of all the content that Jeff is doing and others is likely to be more on the order of a magnitude of a 35X increase over what we have now, which I personally think is too conservative because those studies were generally done before the iPad really took off. So that's a gap that we have to close if people's expectations to be able to get content and incredible data-rich services over their mobile device is going to work.

We have various parts of spectrum where most people would look at it and say you know what? That seems underutilized. We're not really sure if the market would put the spectrum to those uses if there really was a free market and if there weren't parts of spectrum allocations that were protected for market discipline. Certainly a lot of people point to over-the-air broadcast spectrum as being in that category. When I was a kid, I got 100 percent of my broadcast viewing over the air.

Today, most Americans get under 10 percent of their broadcast viewing -- this isn't a point about TV and the success of TV. Jeff was right, TV is going Internet. What was the over-the-air broadcast TV business really should just become the TV business.

So how do we get to an area where we can think creatively about the 300 megahertz -- believe me, it's a big number -- of very high quality spectrum in every market that's set aside for what was very important technology in the 20th century? Well, here's the idea that we've put forward.

I agree with Randall that auctions have been the best method devised to allocate spectrum. What we've proposed is running essentially a two-sided auction where the supply of spectrum in that auction would come from broadcasters and there are bands that we could look at, too, who would create the supply of spectrum for this auction on a voluntary basis, incentivized by getting some portion of the share of the auction proceeds. We basically let the market say, hey, look, you know what? If you think you have a better idea for use of the spectrum than what the market is willing to offer you, that's fine, if not.

And the reason why -- some people ask why does government have to be in the middle of this? The reason is the way that broadcasting was originally allocated, a checkerboard of 6 megahertz blocks noncontiguous so that we could have local broadcasting and not interfere from town to town or city to city, I think Randall will agree that

that's not the way that companies like AT&T and others want spectrum for mobile broadband. They want large contiguous blocks of license in blocks more than 6 megahertz.

So what we need to do is incentivize underutilized license holders to give us back the spectrum and then reorganize the spectrum so that we can free up big contiguous blocks. I'm getting a little bit more wonky and detailed here than I should --

MR. WEST: That's okay at Brookings, by the way.

(Laughter)

MR. GENACHOWSKI: But this is a -- you know, it's market-based idea that will help make sure that our invisible infrastructure, our spectrum infrastructure is what it needs to be in the next few years. We need the authority of Congress to do this because oddly we have the authority to take back spectrum from someone, we have the authority to auction it off. We don't have the authority to share proceeds to run a two-sided, incentive-based, market-friendly auction.

So this is an example of what -- you know, one of the things I think we can do. There are other things we're doing on spectrum to reduce restrictions on other bands of spectrum to allow more mobile broadband use. There are things that AT&T and other companies are doing on the ground to get more efficient use of spectrum that we're trying to encourage. But the big ticket thing is this incentive auction idea, which if we don't do it I'm very worried that other countries in the world will end up with a more robust spectrum infrastructure than we will, and this huge advantage we have right now of the most incredible mobile innovation occurring in this country could move to other countries.

And, you know, it sounds crazy, but, you know, a few months ago, people woke up and read the newspapers and saw that a company called Applied Materials -- very important technology company based in Silicon Valley, focused in the energy technology space -- decided to move its CTO and its technology operations from Silicon Valley to Beijing. You know, how many companies have to make that decision before we say, hey, there's a crisis here, we've got to deal with it?

MR. WEST: Let me ask one more question of our panel and I'll just throw it out to all of you, and then we'll open the floor to questions and comments from you. And it actually follows on the last point Julius was making about the global situation in which the U.S. finds itself. There was a report by The Information Technology & Innovation Foundation that claims that the United States is slipping behind other countries on innovation and competitiveness. It specifically names places such as Singapore, Taiwan, Finland, South Korea, and China as nations that have gained at our expensed. Is the U.S. losing its technology edge? Anyone.

MR. STEPHENSON: Well, I'll give you a classic example. We, last year, put out a Request for Proposal on our 4G network build. And so who would be the technology suppliers, the key technology suppliers? I won't list the four company names, but I will tell you not one of the four is headquartered in the United States of America, and I find that alarming. The United States is driving this mobile broadband revolution. I mean, we are -- we're the engine behind this.

You look at what's transpiring here in the U.S. in terms of the content Jeff keeps talking about and the volumes and the spectrum requirements. There is not a country close to the U.S. in terms of the level of volumes and the innovation that's going into mobile broadband here in the U.S. and the thought that from a manufacturing standpoint not one of those companies is headquartered in the United States I find alarming, you know. And one has to ask himself why? Why is that? And, you know, probably all of us in here would have different reasons for that, but I think that is a patent and a blatant example of where we would seem to be losing perhaps our technology advantage from the manufacturing side and innovation side.

MR. GENACHOWSKI: I just had one thing and I don't know, Darrell, if it's the same study, but there is an ITIF study that looked at 40 industrial countries and ranked them on a small number of metrics relating to innovative capacity and competitiveness.

MR. WEST: Yes.

MR. GENACHOWSKI: And on a snapshot basis it ranked the U.S. 6th out of 40. And these metrics go to broadband and some other metrics that would make sense, I think, to everyone in this room. Ranked the U.S. 6th out of 40, which is an interesting Rorschach test when you tell it to people because some people say, oh, 6th. (Laughter)

MR. WEST: Yes.

MR. GENACHOWSKI: Better than I thought. And, of course, it's crazy the idea that we could be sixth. But anyway, but that's not even what was scariest about the study. The study then looked at the 40 countries and those metrics, including broadband metrics, and rated each country on rate of change. All the countries were improving and so there's really rate of improvement. And on that basis it ranked the U.S. 40th out of 40.

And I'm sure people can attack the study for this or that, but that tells you something that really should worry us. And I also think it gives us a little bit of a clue about, you know, why aren't we moving faster as a country to deal with some of this? I think it's because, you know, we are moving forward when it comes to broadband, but other countries are moving faster. And so we have the illusion of forward progress and most Americans don't really appreciate that other countries are very, very focused on this.

I know when I visit with my counterparts in other countries, they're very, very focused on this. In Australia recently an election turned, literally one government was picked over another because of broadband policy. But I do -- you know, I do worry that if we don't take care of our broadband infrastructure over the coming years, then all of the incredible innovation that we see at, you know, companies up here or others, companies scattered all over the world, that we're not going to have the basic infrastructure on which those products and services can succeed, and we risk seeing that innovation shift to other parts of the world. And I do think that there are things that we can do to tackle it.

MR. WEST: Jeff?

MR. BEWKES: I agree with all of those things and the media business, content creation, is not primarily thought of as a tech -- because you asked the question in really the frame of technology, (inaudible) innovative technology. If you have a healthy infrastructure on -- technology innovation is not the only kind of innovation. And I think Glenn said at the beginning, business model innovation, innovation in the things that given the rule of law and cultural history of the United States -- think of basically free expression, content diversity -- one of the great -- in fact, I don't want to overstate it, but the forms of popular entertainment, whether it's music, movies, television, magazines that exist around the world, there were most of them pioneered in the United States because of the nature of our society. And so while I take nothing away, I agree with all the statements on how to preserve a very innovative and capitally funded platform on tech infrastructure, let the American system work in terms of content creation. We're the best at it. We're the only country where all over the world everybody wants our popular cultural exports, and they range from the somewhat tawdry, as we all know, to the quite excellent in other ways.

And so let's not forget that innovation goes beyond technical and guys in white coats. It includes business model freedom. It includes that intersection of popular culture and free markets that is so admired around the world, that is instantly taken up and copied. I'm talking about forms of TV shows, forms of movies copied in other countries in other languages with other casts.

MR. WEST: Right.

MR. BEWKES: Let's not count ourselves out. We have huge areas of success.

MR. WEST: Let's open the floor to questions and comments from you. There's a person with a microphone right there in the aisle. And if you could give us your name and organization, and we would request that you ask a question as opposed to making a long speech because the only people allowed to make long, boring speeches at Brookings are the scholars, of course. (Laughter)

MR. GOSTEV: Sergei Gostev, Russian Academy of Sciences. I have a question for Chairman Genachowski. I have read an article in the *Washington Post*, I think, about your efforts to restructure this Universal Service Fund and I found out that companies like AT&T and Verizon are actually blocking the efforts to restructure the program. Is that true? Thank you.

MR. GENACHOWSKI: Well, first, I bet you when I first said Universal Service Fund most people thought that's not what we're going to talk about today. So it's not true actually. I think we've been working with a very broad set of companies and others in the ecosystem around Universal Service Fund and Intercarrier Comp to come up with a smart, efficient way to transform it, to modernize it from telephone service to broadband. And so unless, Randall, you're doing something that I don't know about --

MR. STEPHENSON: (inaudible), you doing something I don't know about? (Laughter)

MR. GENACHOWSKI: I think we're in a position that's not easy because, you know, in a lot of different areas, I would say in both the USF area and in the spectrum area, we face as a country sort of innovator dilemma problems, where it's sort of precisely our successes in the 20th century that present challenges from both the business and a public policy perspective for the 21st century. And so, you know, telephone service -- I think the rollout of telephone service in this country in the 20th century was a huge success, helped fuel commerce, connect people, connect businesses. You know, I remember as a kid traveling to other parts of the world, you couldn't go anywhere that had better phone service than the United States. It mattered.

Now, around that built up a whole series of policies that were optimized for telephone service and the market structure that existed at the time. And they created all sorts of acronyms and words that no one understands, but the bottom line is what made us successful in the 20th century is not what we need in the 21st century. But the fact that a whole series of reliances and dependencies grew up around these old programs makes transition hard, just as it does for, you know, a market-leading company that deals with a new disruptive technology and may know exactly what it needs to do strategically. But it can be hard to make the change, and Jeff is doing it at Time Warner. It's much harder sometimes than having a whiteboard and starting something from scratch.

Spectrum's the same way. You know, in the 20th century -- and I think Jeff alluded to this before -- what we did with spectrum in this country, none of this is perfect, but on a comparative basis we commercialized our spectrum here faster and better than any other country in the world. It led to a very vibrant, healthy broadcast television industry that, together with our film industry, created this content industry that is a major American business, a major export to the rest to the world, and, you know, has been an amazing contributor to our economy.

My point is that some of what led to that success in the 20th century, you know, in particular the use of spectrum for broadcast television, is holding us back from what we need to do in the 21st century. And what I'm looking to do, and I think Brookings is a great place to talk about this, is to get people to say you know what? Yeah, that's kind of right and let's tackle this innovators dilemma and make the tough policy choices that we need to make so that whether it's USF or whether it's spectrum, we're moving in the right direction for the 21st century so we can really unleash the kind of things that these companies and others are doing in a world that’s very different because the global environment is very different.

MR. WEST: Other questions? Right there.

MR. BOLIEK: Hello. Brooks Boliek, POLITICO Pro. I listened to you guys talk about the market and having lived through a couple of huge market failures I wonder where does the public interest come into this? Should AT&T be required to make my iPhone work in Manhattan? Should Time Warner be required to, in, you know, the broadcast world, with the indecency, comply with indecency? Where does that come from? Where is the public interest in all of this about how great the market is?

MR. GENACHOWSKI: Look, I think everything we’ve been talking about today has been about the public interest, you know, driving the American economy, driving innovation, driving job creation. So this has been a discussion about the public interest.

On -- you know, Randall will have something to say about iPhones in New York. I will tell you that a lot of the spectrum discussion has been about that, and I think Randall can elaborate on that.

On indecency there’s not much to say. We’ve got litigation that’s addressing that issue in courts and we’ll have to fight that litigation and see how it’s resolved.

MR. STEPHENSON: I think the free markets have worked quite well when you think of wireless. An iPhone comes out, I mean, think about this. That came out three years ago. And in the course of that three years, you know, two years ago there was no such thing as an app store. I mean, literally it was launched two years ago. This thing is moving at a remarkable pace. But as a result of that technological introduction, the iPhone, now you look at the opportunities, whether it be an Android-based, a BlackBerry-based, a Windows-based, you know, everybody has a touchscreen, smart phone, mobile broadband type device in the marketplace. And absent that, I don't think you would see this kind of proliferation of technology. You're seeing the same thing happen with tablets today. You have kind of the state of the art come out right off the bat, iPad, and now there are tablets proliferating all over the place.

And so I would suggest the markets are working very well. The markets, trust me, are driving AT&T to invest at levels that are unprecedented in the history of our company, trying to stay ahead of this capacity and innovating new technology.

You know, it's -- you listen to the discussion on broadband build, it's kind of an interesting, below-the-radar-screen type phenomenon, but one of the greatest broadband projects in the world right now is all the fiber being deployed to these cell sites all over the country. I mean, we're investing a lot of money -- Verizon, Sprint, T-Mobile -- on deploying fiber out to these cell sites. So you're getting this massive introduction of technology as a result of these technologies. The free markets are working. It's driving this industry to invest at unbelievable levels. It's driving technology curves that I think are very, very impressive. And it's driving prices down. I'm not sure what more you want out of the system.

MR. BEWKES: I think if you asked about compliance with indecency, that has a specific meaning. Julius addressed it in terms of broadcast because it comes over the airwaves into your home unbidden, you don't choose it. If you look at the voluntary industry, the one where you choose a channel or a magazine or a book, you put it in your home, what the industry does and we certainly do is we label and identify exactly what's in there so you have the choice and can control it. And there's plenty of things if you're particularly focused on the question of indecency with regard to television that allow parents to try to deal with what their kids do. Now, it gets -- I'm not sure if it's funny or sad that your kids can beat you when you're trying to use those devices. It's a difficult problem.

But just think about the thing -- if the question was asked in reference to television, think about asking that question in terms of the Internet and what content and lack of control there is for people, particularly young people, to wander into really bad neighborhoods. And everything that you have as an issue, if the issue is, you know, suitable content for younger -- for kids, you have it in spades in the Internet.

MR. STEPHENSON: And you take that to your kid's mobile device and it compounds, right?

MR. WEST: We have a question over there?

MR. AUGASE: Thank you. Byron Augase from McKinsey. I wanted to ask a question about -- well, this is a huge industry and has a huge impact in and of itself on investment and innovation. I wanted to ask a question about its impact on other industries as an enabler.

Julius, you mentioned health care, education, energy. Just to take those three examples, those are huge industries in themselves where consumer behavior and new business models can make a big difference in those industries. What are the most interesting examples or opportunities you see for this industry enabling others like that to innovate?

MR. STEPHENSON: All of the above. I'll go first and you have a lot to say on this and you and I talk about this a lot. But health care is the most dynamic that I can think of. And you think of the health care ecosystem, if you really want to drive efficiency, you want to drive innovation, you want to drive improved health, the telecom infrastructure will probably accomplish this I think as effectively as anything. Health care in the home, you need significant bandwidth into the home to really begin to have monitoring capability, diagnostic capability, as well as access to doctors all over the world. If you have a really robust broadband infrastructure into the home it changes a health care delivery model. These mobile devices that we're talking about and think about this spectrum, the ability to monitor diabetes patients real-time live with devices on the body, the ability to monitor heart patients, it just goes on and on, it's a very exciting area. But, again, the more this proliferates, the more demand and the more stress it's going to put on Julius' spectrum situation that he's talking about. But this will change how health care is delivered. And then I won't go into it all, but you can, you know, let your mind go what that means as it relates to education and then energy.

You know the smart home, I'm not sure that the energy sector itself will lead the way in terms of the smart home and energy management. I do think a robust broadband infrastructure will accommodate people to begin to manage the home energy requirements and business energy requirements independently of the energy sector, but I may be proven wrong on that.

MR. GENACHOWSKI: I agree completely. Health IT, huge opportunities. You know, we're moving to make medical records electronic. You all know about that. If we make medical records electronic and then we forget to connect hospitals and clinics and family doctors and patients, you know, as appropriate, we won't succeed on the incredible cost-saving benefits from electronic medical records and that new industry won't be as strong as it could have been if we get the communications infrastructure right.

Energy, same thing, I agree with Randall. Integrating smart grid and our broadband infrastructure in a smart way that empowers both, you know, the supply side -- the providers' electricity -- and the demand side -- consumers -- huge opportunities.

Education, same kind of thing. Distance learning is a wonderful thing. I've had the chance to see it upfront as I have some of the health care examples. And let me just close on this point by talking about digital textbooks. You know, it's such a wonderful vision. I have a 19-year-old who, you know, during high school and most of elementary school carried this big backpack, 50 pounds of books to school back and forth every day. He was lucky he went to a good school. His textbooks generally seemed up-to-date. Most of the country they're carrying around 50-pound backpacks of books that are not up to date. This whole thing is crazy, right?

There's no reason, especially as the prices of tablets are coming down, that every student in the country shouldn't have some kind of digital learning device that has all of their textbook information and can be -- this is easy for innovators around the country, right? -- personalized learning so that you can actually help teachers deal with 20, 25, 30 kids in a class who are at different levels on math or other things. We should be the first country in the world to move from paper textbooks to digital textbooks, and it's a wonderful national challenge.

MR. BEWKES: We're just thinking make more doctor shows. (Laughter)

MR. WEST: Okay. We have two -- we're going to take two questions over here, John Thornton and Zoe, and then we'll give our panel a chance to respond to each of them.

MR. THORNTON: This is for Julius. Just to be very pragmatic on this topic with this wall that Randall talked about of spectrum and your proposed solution and all the good that could come out of that, just for kind of a sanity check what are the chances that the Congress will go along with your proposed solution? And if so, in what timeframe?

MR. GENACHOWSKI: You know, I --

MR. WEST: Hold on just for one minute.

MR. GENACHOWSKI: Yes.

MR. WEST: Zoe will -- we'll take multiple questions and then give the panel a chance to respond to each of them.

MS. BAIRD: Zoe Baird, Markle Foundation. Jeff, you spoke with great enthusiasm about the ubiquitous platform where you could identify people on lots of different devices and deliver all the content they want. You also talked about the places America innovates that include our values and our policy interest. Randall, you talked about the need for the sustainability of policy and regulation and health care, health IT.

Embedded in all of that is an unstated question. I hope this isn't a downer at the end of the program. I hope you'll approach this with the same enthusiasm. What are your ideas for how to innovate a user control of information and on privacy protections so that we can have predictability and the robust use of IT that you'd like to see can be sustained without user backlash?

MR. WEST: Okay. So, Julius, your plan in Congress and then user control and privacy.

MR. GENACHOWSKI: Well, I'm not an odds maker and I defer to other people. I do think that the incentive auction idea, you know, bringing market forces to underutilized bands of spectrum, is exactly the kind of idea that should be nonpartisan where everyone who's interested in our spectrum future should be able to roll up their sleeves together and say let's make this work. So I'm hopeful. We've had good conversations with people on both sides of the aisle. You know, our job at the FCC is to be a resource. We will be, we'll be very active, you know, and I'm hopeful, but not certain. You know, there have been examples where smart, good ideas didn't go anywhere.

SPEAKER: What's the timeframe?

MR. GENACHOWSKI: Well, as soon as possible. Really, I mean, I think, you know, running this kind of process is not instantaneous, right? It takes a few years from developing the idea to actually running the auction. I think given that the trends around spectrum usage are not slowing down, right, Jeff wants to get his programming on every platform everywhere, you know, using creative business models, and that's great. So the gap is going to increase. We've got to tackle it as quickly as possible. So I think every month that goes by without tackling this is a month that hurts us from a global competitiveness perspective.

And just one word on that. Other countries are looking at exactly this, not exactly the incentive auction idea, but at freeing up more and more blocks of spectrum for mobile broadband. Many of our global competitors don't have the same challenge because they weren't as successful in the 20th century and they didn't commercialize their spectrum, and so they can have much easier conversations inside their countries about what to do. We actually have to tackle harder problems here, spectrum USF, because of our success in the 20th century. Well, that's fine. I just think we have to admit that and figure out what we're going to do about it and not let, you know, older reliances and dependencies slow us down.

MR. STEPHENSON: Can I make a brief comment? I think he's right on and I -- the sense of urgency, I'm very pleased with where Julius and his staff are on this. Historically, from the time we began one of these processes till the time we put spectrum online it has been about six years. Six years is too late on this one, you know. And it's arithmetic, right? You run out of spectrum, where does it squeeze out? It squeezes out on price. It's rationing, right? So the urgency on this one is really important.

MR. BEWKES: On the question on privacy, I don't think it's a downer. I think it's a great question. It actually offers a lot of opportunity. There's no reason that giving all of us more choice over what we want to read, watch, whatever it is and get it when we want on whatever device and not pay extra, that doesn't need to lead to any diminution of privacy. But if you talk to different age groups or different individuals, people choose differently as to whether they want people to know what they're watching or reading or whether they want to share that with someone else. Young people tend to want to share it more. I think we all know in terms of popular media that one aspect of popular media, go to the movies with your friends, talk about it with your friends. Increasingly, people do it at home or on screens and they communicate or get their friends to watch it with them.

The point, I think, is that it has to be a real choice, not this thing where whoever's creating the system creates an opt-in or an opt-out in a way where you end up or your kids end up defaulted into lack of privacy that they did not want. And you know it's a very complicated issue. There's a lot of people, I'm not one of them, that want all their -- what they do tracked so they can be given either content proposals or advertising that fits whatever they're doing. I don't like it, but some people don't care. The point, I think, is we've got to really make it so it's in the control of the people, not the corporations as to how it works.

MR. GENACHOWSKI: Can I add one thing just very quickly why it's such an important topic. We have a broadband adoption challenge in the U.S., right? About 65 percent of people have adopted broadband. It should be closer to 100 percent. It's 90 percent in Singapore. We have an adoption problem when it comes to small businesses in the U.S. Too few small businesses are taking advantage of the opportunities to expand their markets and lower their costs with broadband.

There are many reasons for this, but one of the reasons is kind of a lack of trust in what happens with information when it goes online, and some of those concerns are legitimate. And so in addition to the really powerful values reasons for getting privacy right, there's also an economic reason. If people aren't confident that the Internet is a safe place for their families, a safe place for their businesses, they're going to hold back and that undermines the kind of positive ecosystem of innovation that will really matter to our economy.

MR. WEST: Okay. I think we have time for one last question.

SPEAKER: This question is to the chairman of the FCC. Many years ago, about a decade ago, when I was in secondary school in India, we were learning about data and database management. By the time I finished secondary school, we were talking about information technology, how to manage information technology, because information was (inaudible) of data. And by the time I left school, India was talking about a knowledge-based economy. So it is something like a (inaudible) it's a pyramid. You have data at the bottom, information on top of that, and on top of that comes knowledge and beyond that comes wisdom. And I've heard that the Chinese government is actually trying to create that wisdom-based society.

So today, in 2010, we are actually sitting here and talking about the future of this country and you're talking about creating an information economy. So don't you think that you're actually looking backwards instead of actually looking forward? Because some other countries are actually doing that from my own experience.

The second question to --

MR. WEST: Actually I think that question will be sufficient in our time remaining.

SPEAKER: (off mike)

MR. WEST: The switch from an information economy to a wisdom-based economy, I like that question.

SPEAKER: Yes, it's a good one.

MR. GENACHOWSKI: I'm not sure I completely understand it. I think --

MR. WEST: That's what makes it such a great question.

(Laughter)

SPEAKER: Glad you got it.

MR. GENACHOWSKI: But it wouldn't be the first time. So I'm going to apologize, maybe we can talk about it afterwards.

MR. WEST: But I think the general point he's getting at is how -- are we as forward-looking as some other countries? I mean, when you think about India, China, other countries in Asia, I know when I travel there I'm very impressed with just the decision they're making, their governance structures that seem better designed than ours to make these types of changes. Do we need to be more forward-looking?

MR. GENACHOWSKI: Right. Well, I think that's been the subject of the discussion and there's a real challenge there that we face as a country. As I said before, when I travel and meet with my counterparts around the world there's a tremendous focus on unleashing investment and innovation and opportunity around these devices and we need at least equivalent focus here. So I think that's incredibly important. And as I mentioned before, you know, moving forward slowly isn't good enough.

Glenn mentioned at the beginning the point that other countries have national competitiveness policies and we don't. You know, we did produce our country's first National Broadband Plan in which a lot of ideas that we're talking about today were developed. I think doing, you know, more work together with the companies that are building our infrastructure, innovating, creating the content that's on the infrastructure is very important.

I'll mention one other thing. One of the things we did in the Broadband Plan that I look forward to doing with others more broadly is some goal setting for the country. And so we set some goals in the Broadband Plan around speeds, around adoption, around a vision for where we want to be as a country in 2015 and 2020. And more of that, I agree with Glenn, would be helpful.

MR. WEST: So with that footnote on wisdom we will conclude this session. I want to thank Jeff Bewkes, Randall Stephenson, and Julius Genachowski for sharing your views with us. (Applause)

(Break)

MR. KATZ: So, we're going to start and people will begin to drift back in.

I'm Bruce Katz. I'm the vice president here, and I'm director of the Metropolitan Policy Program at Brookings.

And this panel is going to focus on the potential of the green economy to really transform the broader American economy at a time of intense global competition. And I think the order of the day, there is a method to the madness. It really makes sense to follow the prior panel on information technology because the shift to a low-carbon economy is going to be a market transformation really as profound as the information revolution. It is going to rely on technology, it's going to require smart public policy really at all levels of government, and it occurs within a period of intense global competition.

So, our perspective coming from the Metro Program, looking from the ground up is everything is about to change, and, frankly, everything is changing. The energy we use is migrating from an almost exclusive focus on carbon fuels to a more sustainable mix, wind and solar for sure, but also nuclear. The infrastructure we build is moving from outmoded transportation and energy to systems that are smarter, more technologically-enabled, more focused on market pricing, the products we buy are moving from high-carbon gas-guzzlers to obviously a basket of sustainable goods, and the homes we live in and the buildings and retail facilities we frequent are becoming more sustainable in design, more efficient in their use of water and energy, and, frankly, better arrayed so that we can walk less, spend more, have higher quality of life.

Like the information revolution, this is a transformation that is ubiquitous, it affects everyone and every place, but it also concentrates in major cities and metro areas here in the U.S., Europe, Asia, Latin America because certain places are really going to leapfrog to the front of the line on idea generation, on production and deployment, on financing.

At the Metro Program, we're actually trying to map that sectoral and clustered differentiation within the United States compared to our competitors. This is a competition, and I think a lot of this conversation, I think, frankly, is going to be how does the U.S. play in this transition to low carbon when places like China and Germany ahead of us at embracing this as a market transformation. Obviously, there are very positive environmental consequences of this transition, but we see competitors abroad, particularly China, hell bent on out-investing us on renewables and other aspects of the green transition and out-competing us.

So, I think what we're going to try to do in this panel is really focus on three levels of conversation: Where does the U.S. fit in this transition to a global, low-carbon economy? What are our strengths? What are our assets? What are our attributes? How do we strengthen them? What should we be doing from a public policy perspective to catalyze markets and catalyze investments and grow jobs, and then, realpolitik, what can be done at a time of intense partisanship and polarization if the feds can't quite act to send the right signals to the market, what can states do, what can cities do, what can metropolitan areas do? That's the genius of our system.

We've got three, great panelists to sort of walk us through this.

The first to my right is Jeff Immelt. He's the CEO of GE. Fourth on the *Fortune* 500 list; 300,000 workers, many countries across the world, so can give us both the domestic perspective, but also the global perspective.

Michael Greenstone is a colleague at Brookings. He's the director of our Hamilton Project, served in the Obama Administration, but also has real deep expertise in environmental economics, the economics of climate change.

And Mac Heller is the head of Coda Automotive, a small firm really at the sort of cutting-edge vanguard of electric vehicles based in that production engine, Santa Monica, California. So, that's going to be a special conversation with Mac.

But I'm going to start with Jeff because there's something that you wrote with John Doerr back in 2009, which I think really sets up this panel. You said, “The U.S. has no long-term market signal to tell companies and consumers that it values low-carbon energy. It has no policies to discourage sending hundreds of billions of dollars a year overseas for energy. It does not offer adequate, sustained R&D funding to be a serious competitor in this huge business.”

So, like the information revolution, the green revolution really requires a platform of policy, smart policy to catalyze markets, innovation, and investment. What’s your assessment today, 18 months or so after you wrote that with John?

MR. IMMELT: It sounds more like John than me, but so, first, I would talk about it in terms of clean and not green. So, I’d broaden the definition to talk about energy productivity, energy security, pollution reduction in its broadest terms. It’s a great business. It’s not a good business, it’s a great business. When you look at the consumption for electricity around the world between now and 2030, when you look at where the adoption cycle is in India and China on automotives, when you look at the amount of technology that’s possible, when you look at a number of different emissions, this is going to be a great industry for somebody over the next 10 or 20 years. So, let’s kind of start with that.

At GE, we are long in the space. We’re about a $45 billion energy company, probably the biggest in the U.S., one of the biggest in the world, where in many places, we’re the only American company that competes in these spaces. It's a business that's tripled over the last decade. So, this is going to be a big business for somebody.

So, who wins? I would say that basically everybody in this room is smart. If you basically do in your own mind kind of a little matrix, and on one side is market, how big is the market going to be over the next 10 years because markets accumulate practitioners, and practitioners decide who wins. So, how big is the market, who owns the innovation, how much R&D is being spent, where are the patents, things like that.

The third element is who's got a low-cost supply chain? Energy is a scale business. If you took one thin film technology to commercial development, one, you will spend more on R&D than Google spent before it became a public company. So, a low-cost supply chain.

And then the fourth element is public policy. Who has public policy? You can have a small market, but if you have aggressive public policy, you can be a winner. And then plug in on the other side, China, United States, Germany, Australia, Canada, and things like that, and then you plug into that matrix solar energy, natural gas, coal gasification, every technology that's out there, and that's the clean energy future. It's going to be decided on technology, commercialization.

The U.S. doesn't win on many of them, if any of them. Fundamentally, China is kind of green on all of them, and Europe, because it uses public policy, is green on some, and the U.S. basically, in other words, GE is going to invest on coal sequestration, but we're going to do it in China because that's where the practitioners are. There are no real practitioners here.

And so, from a GE standpoint, we can kind of bob and weave and decide where we want to go, and we're a global company in that we can decide our own destiny. But if we decide as a country that we want to be a leader in the clean energy revolution, we've got to fill in this grid for ourselves and we have to decide where, and there are certain areas like natural gas we can still be the winner. So, that's kind of the state of play, big industry.

Our destiny right now has not really placed us to where we can lead in that destiny.

Now, I no longer talk about what I'd like to see. I'd rather talk about what we could see. I hate coming to any session and just whining about blah, blah, blah, right? Because there's plenty of ways you could do that. I'd say here's what we could maybe see. A focus on efficiency, you can use the tax code to encourage efficiency. Efficiency is a great thing. It helps consumers, it helps spawn industries. I think that would be really good.

Some kind of indication. What I'd say, clean energy standard, they didn't pick a technology or a fuel, but basically said look, let's get our carbon footprint to X by a certain date, maybe pick the utility industry, fuel agnostic. Coal could get there if it did certain technologies. Gas could get there. I think that might be possible, and in many ways what we have today is almost too many energy policies or none at all, but something like that would be helpful.

A way to nurture investment, kind of what RPE has done. I do believe that that helps some of the small companies get launched. And then a good export policy. In other words, our market here is not going to be that big. GE might make 120 heavy-duty gas turbines in Greenville, South Carolina, every year. Five go to the U.S., one hundred fifteen go outside the United States. So, a good export policy.

And the last thing I'd say, Bruce, is just words like green have killed this movement.

MR. KATZ: Right.

MR. IMMELT: It's so precious, it's become like such an elitist indication that I think we have to talk about energy security, energy efficiency, job creation. This has to be reformulated and remarketed and repurposed because it's just become an elitist us versus them, and that's never what -- this has always been about technology, job creation, productivity, American leadership, and it all got lost, and so, I think that's how I'd end.

MR. KATZ: Okay, prefect beginning. You took it exactly where I wanted to go, to the practical what can we get done?

Mac, we're going from the large to the small, and you are at the cutting edge of a sector which I think actually has captured the American imagination. Electric vehicles, I mean, a completely different vision for mobility in the country. But, as we all know, has profound effects on place, the infrastructure necessary to support it. Where do you see the future moving, and really given Jeff's great matrix, where does policy fit in?

MR. HELLER: Thanks, Bruce. Let me zoom right down to ground level from the heights of policy.

Coda, as many of you know, is an electric car company and an electric battery storage company for vehicles and for grid storage, and so, we're a technology company, but we're also a consumer-facing company. And as we think about innovation and the United States and job creation, let me start with a couple of things that I think are working. First is privately-funded R&D. U.S. investors have created U.S. numbers that are higher than the private investment numbers for other countries around the world, and I'd like to go further and say that the U.S. R&D allocators have been shrewd stewards of capital and the returns or the discoveries per dollar, the patents per dollar have generally been superior.

We discover in the United States many, many commercializable technologies, and so, that brings me to the second thing that I think is working well, which is the discovery itself. When you go through our area, if you want to look at a high-spec lithium-ion battery system, look in the Mars Rover, look in the B-1 Bomber. Everything, as we look forward from smart grid technologies to vehicle to grid technologies where electric cars will be distributed, storage for utility grid systems, and you may be selling power back into the grid as your car sits in the garage at night, a very high proportion of that discovery takes place in the United States. So, the two things working well, private funding and discovery.

Where we fall down, however, is the next two steps, and the first is creating -- Jeff mentioned this -- large and dependable home markets for these technologies. If you invent something here, you may well decide to market it first in the EU or in Asia.

Why would you do that? You would do that because governments in those places may well have created the sustained regulatory structures and the sustained price signals that are necessary for the successful and secure commercialization of new technologies. It will be a more secure market for your product somewhere else. This is a very big issue. And when you combine it with those other nations, generally higher or better rate of change public investment in R&D. The picture for U.S. innovation begins to get a little bit dark.

So, let me turn to the second area where I think that we need to improve, and that is manufacturing. Would it upset you to learn that lithium-ion battery technology was actually invented in the United States back in the 70s, but in terms of manufacture, until very recently, there was no scale manufacturing of lithium-ion batteries in the U.S.? That was done in Korea, Japan, China. It should not be that way. So, we need to fix these two things: creation of large home markets and the establishment of domestic manufacturing because here's where I could become quite concerned as we move forward, and this is a very important point.

A number of people have mentioned the Consumer Electronic Show in Las Vegas. I was there on Friday. When you look at that show, you realize the following observation: If the center of manufacturing and of initial consumer adoption or industrial adoption of new, clean technologies is outside the United States, the locus of innovation will follow. In other words, as EVs and associated devices gain broad consumer adoption in the next few years, we will receive so much data about how consumers actually drive, how batteries actually charge and discharge, and how consumers will modify their vehicles, and that's what the CES was all about, that the next technologies will spring directly out of that consumer innovation feedback loop, and if you are not sitting in the geographies where that feedback is taking place, you will loose your innovation edge.

So, having made the picture a little bit dark, how do we solve this? I've got a couple of ideas, and, by the way, this doesn't necessarily have to involve government money. Outside clean technology, I will give you the example, remind you of the example of seatbelts and airbags. This is decades ago that when they were two new technologies, initially, to some extent, opposed by the industry because they were said to be expensive and because consumers, it was said, would not favor them.

What we did in this country is introduce a sustained federal policy and used that policy to drive volume and use that volume to drive costs down, and the result, as we all know, has been the saving of tens of thousands of lives.

So, putting issues, as Bruce has counseled us, to speak in the world of the real, putting possible federal clean tech subsidies aside and putting aside taxes on carbon, although I will note that other competitor countries have decided those policies are worthy of exploring, they've been enacted in various forms already by competitor nations, in the EU and Asia, and they are already having an effect in those nations of adjusting innovation and commercial behavior, consumer behavior toward a future more free from foreign oil than our future will be.

But putting those aside, let's talk about a couple of near-term things that could be done to foster innovation in the EV and battery area in this country. I won't go into these in great depth, Bruce, but Q and A may result.

Broad adoption of time of day electricity rate differentials, if you drive electricity usage from its concentration in the afternoon to spreading it more evenly over a 24-hour cycle, you foster renewable technologies and a whole series of smart grid devices, and you will learn in this country which innovations are most profitable.

Secondly, introduce a federal ZEV credit system. There are Zero Emission Vehicle credit regimes operating in California and about 13 other states. Those involve no tax dollars, and what they do is draw money from people producing only gasoline-burning cars and move that money through a series of calculations to those producing clean-energy cars. You could do that. There's also been discussion of a feebate ZEV credits applied to new cars, feebates are generally discussed for cars out in the vehicle fleet now.

Finally, acceleration of corporate average fuel economy standards. This has been something where the U.S. has made significant strides in the last few years in regulation.

We now include, for instance, the Lincoln Navigator as a car, but, as you know, the largest selling vehicles in the U.S. are the Ford F150 truck, et cetera. Those only recently have been included in this regime, and it's a good development, but on the numbers, all of our competitor nations are ahead of us. They are using that type of regulation to drive fuel economy and to drive clean technology transportation forward. We could do better there.

I'll stop, Bruce. There's a lot we can do.

MR. KATZ: So, Michael, you can talk about the full spectrum of this. Building on the last panel again, but I want you to focus on the effect of this transformation on American workers and families in this regard, and it really builds from what Jeff said before. When people hear green economy, what they generally hear is well, that's about the environment or potentially that's about tax. We're going to basically raise either specific taxes to lower consumption or we're going to raise taxes to invest in certain kinds of infrastructure. What they don't hear are the benefits potentially from jobs created or for certain kinds of jobs created that pay certain wages and incomes. What is the fuller opportunity picture as we sort of talk about the transformation of the economy?

MR. GREENSTONE: Yes, I was going to pick up on Jeff's comment about green is too precious. I think that's right.

I think two of the most urgent problems that the country faces, although it's not the topic we've been tasked to talk about, the first is American competitiveness is at risk. And it's not at risk tomorrow, it's at risk today, and it's been at risk for the last three decades. There's a series of statistics that are familiar probably to most people in the room.

The median wages have stagnated for the last three decades. No real income growth for most families. Male labor force participation is down. Our share of high-tech exports in the world has declined from 20 percent to 12 percent, and I think all of that together kind of threatens in some sense the American dream in the following sense: At the core of this country, it's been that each generation does better than the previous one, and I think for the first time, we're seeing over a very extended period of time that that's not the case, and ultimately I think that can tear at the social fabric that holds the whole country together. So, I'd say that's problem number one.

And the second problem, which Jeff and Mac have alluded to, is kind of an energy problem at large, and you can see that in our dependence on fossil fuel, you can see it in our energy security, and then you can see it, lastly, in climate change. And, again, these are not problems that are going to appear tomorrow, they're not problems that are going to appear in a decade, they're problems that are here today.

In the case of our fossil fuel dependence, there's no question that our foreign policy is constrained by a reliance on importing oil from the Persian Gulf, a region that is unstable at times and not always friendly to the United States. The warming of the planet is now unequivocal. Temperatures are rising, and they're doing so at a rate that the planet has never seen before. And the problem with that, of course, is that fossil fuels are the cheapest source of energy. That's why we don't have a climate policy, that's why we don't have a tax, that's why the world doesn't have a price on carbon.

And I think what Jeff and Mac are trying to do is bring down that price differential, and I really think that finding a way to bring down the added costs of low-carbon energy is really central to solving these two problems that I think are two of the country's most urgent, if not the most urgent problems.

And just to put a fine point on it, I think the economy that innovates to reduce the cost of low-carbon energy will have effectively built the better mousetrap, and once that happens, the world will come and buy lots of mousetraps and nice cars, and the millions of things that

Jeff's company builds.

And so, I think you want us to focus on policy. We can all say a prayer for a price on carbon, but that's not happening very soon, I think. I think there is a path forward that can solve these two problems that is available and is not quite so gut-wrenching as we seem to find the price on carbon, and that would be to undertake a serious energy R&D program for the country and that it's focused on low-carbon energy. And it's very important that that be focused on the R&D not that private companies do, but the R&D that produces knowledge that private companies can take advantage of, and that's the kind of R&D that private companies can't do. Their investors wouldn't allow it.

And let me just give you a sense of the scope of the problem in that area. In 2009, we devoted 1-100th of 1 percentage point of GDP to basic energy R&D. Among the top 12 countries that spend the most in OECD on energy R&D, we're in 12th place. And, in general, we have a R&D policy in the energy sector as opposed to in health and other areas that's been focused on deployment of existing technologies rather than a program that is focused on developing the new ideas that can bring down the cost differential of low-carbon energy.

So, I guess my answer to your question is: The path forward that I see in the immediate future is a serious commitment to doing energy R&D and doing it in a way that this country has done in several other arenas. The NIH and the NSF are hallmarks of politics-free science, and we should do something like that in energy.

MR. KATZ: So, let me ask all three of you this question because I think it sort of connects together some of the initial responses. And it's something that Mac said that I think I'd like you to drill down on. I think there is a growing consensus, not the money on the table yet, that the U.S. needs to invest in advanced R&D on the public side to complement the private side. So, the question then becomes: Does the U.S. continue to be the place that generates the ideas that cracks the code, but then sees production in deployment basically happen abroad?

And, Mac, what you said is that if we do not produce more at home, we will innovate less over time because of the interplay of innovation and the production cycle. So, how do we make this link better now in the United States, if not at the national scale, then at the subscale between idea generation, invention, and ultimately production and deployment?

It gets, Jeff, I think to your point of can we be a manufacturing base, but for what, and what has to change to make that happen? Anyone want to take a stab at that initially?

MR. IMMELT: Well, I have a slightly different spin, not that mine is right. I think markets -- practitioners generate ideas, and in that regard, we are not the biggest market. I think the first panel, we're kind of the biggest media market, we're kind of the biggest Internet market. When you look at the gigawatts China is going to build, their car market is bigger than ours, their aviation market will be bigger than ours by 2025. So, we don't have really the market that's going to generate practitioners anymore, and the way you compensate for that, or at least what Europe's done, is through public policy. If you want to win. If you decide solar energy, you pick it, nuclear, I don't want to be the one that picks it.

MR. KATZ: Right.

MR. IMMELT: But if you pick it, you have to either do one of those two things. Now, actually, look, we're not a bad manufacturing country. With lien, manufacturing, with productivity, labor is a percentage of all these products, is relatively small. This is all about the science of manufacturing, workflow, work methods, IT, but if you're in a solar plant, labor is a pimple in terms of what the cost of the product is. So, we could make any of these we chose.

These are high-tech, low labor content, differentiated products. So, I think in the interim, while we're not sure which one we want to be, I think companies have to -- GE has got to do something with Exxon, Chevron's got to pick somebody else. We have to work as an industrial complex to say we're going to work together to make electric vehicles a reality. Whether or not there's public policy, what there is, because we think there's a chance this is a trillion-dollar market, and I want to be first.

And at the end of the day, I don't care what the government does. I'm not going to wait for that. I'm going to say we're going to buy

25,000 electric vehicles and we are going to have as good a chance of everybody of having the infrastructure associated with that because I don't think -- we're not going to be the biggest practitioners and I don't think anybody that wants to advance, anybody that's in that room betting on clarity in energy policy in the United States, man, you're not going to spend GE shareholder money on it. (Laughter)

MR. KATZ: Right.

MR. IMMELT: You can put your own money on it maybe, but that's a hard bet to make really.

MR. KATZ: Yes.

MR. HELLER: Bruce, if you're running a company, you have trouble waiting for government policy in this country. You need to go forward. Having said that, consumers are extremely focused on this, not just in what they drive, but how their houses are, and, frankly, as we talked to consumers, they feel good about the environmentally-sensitive steps they've taken in every element of their lives from recycling to thermo-pane windows, and it is their transportation that remains frustrating to them.

And so, like Jeff, we believe that consumers in this country and others are more than ready for an EV revolution, and the reasons, they're not just green. Consumers talked to us about a desire to reduce our dependence on foreign oil because it is the single largest strategic weakness of our country. It is a matter of patriotism for them. They worry about our shipping billions of dollars, hundreds of billions of dollars every year overseas for oil, and that money is not coming back.

They talk about health reasons. They talk about wanting the U.S. to be a technology leader, and so, for many of our consumers, adoption of electric vehicles and broad-based EV technologies, including battery technologies, is a matter of patriotism.

I would also say that manufacturing in this country, I agree with Jeff, it's actually not about labor costs. You can do some simple math and instead of importing something from somewhere, if you thought Chinese labor rates were going to go up a little bit, if you thought the renminbi was going to appreciate against the dollar a little bit, if you thought over the next 10 years rising energy prices were going to increase shipping costs a little bit, very quickly, the numbers on U.S. manufacturing begin to look relatively attractive. So, I agree.

It's not about labor costs, it's about where's the market. So, I think in retrospect, we need to look back at the last 20, 30 years in this country and wonder whether we, as a country, have put enough talent in the manufacturing.

Jeff and I grew up within 50 miles of each other in the same little corner of Ohio, and within a couple of years of each other. One of us went into manufacturing, the other into finance. Has too much talent in this country gone into finance and should manufacturing continue to be a skill in which we would aggressively compete in the world market?

MR. KATZ: Any thoughts on this, Michael?

MR. GREENSTONE: So, let me just say that let's just accept a couple of things that you all have said so far as a pragmatic set of things that we should focus on. More investment in R&D, some of the regulatory standard setting platform that has been discussed. I think your comment about where the U.S. market stands to some of our competitor markets is really the right setting here so we can compare and contrast with other sectors.

Let's talk about infrastructure for a second because if we're going to transition to a low-carbon economy, we do need to make certain kinds of investments in public infrastructure, whether completely financed by the public side or financed in a shared way with the private sector. The electric vehicle infrastructure, high-speed rail, if we're going to move in that direction. Metropolitan transit, the smart grid. Now, these are all shared kinds of investments at the end of the day.

We've made some progress in this direction in the last two years, but, frankly, limited compared to our competitors, and we're in a fiscal environment right now where any new kinds of investments, whether they have high returns of the long run basically don't seem possible. So, given the broad market we're describing here, I mean, we're touching many different aspects of the transportation sector, the energy sector, and so forth. How do you think about the infrastructure conundrum? We are a first class economy, but every one of us who travels abroad comes back and says we have a third class infrastructure. How do you think about that?

MR. IMMELT: I always laugh, in the 2008 Olympics, if you went to terminal three in Beijing and then flew back to JFK, okay, now which is the emerging market and which is the developed market?

MR. GREENSTONE: Right, absolutely.

MR. IMMELT: Look, I think there's just no appetite for an infrastructure bank or high-speed rail or things like that, and so, I just don't see a tops-down solution. I think Mac hit part of it in that really one of the things that moves the needle in this country are consumers. I actually, before we made our investment in electric vehicles, went out and drove a couple of them. The Volt's a good car.

MR. GREENSTONE: Right.

MR. IMMELT: It's powerful, it's deadly quiet. I mean, I got out to do something. We've got a charging station at the office. When you plug it in, you're empowered. There's a certain freedom about having control over your own -- you don't have to go to a gas station and stuff like that. It's in a consumer's fingertips.

MR. GREENSTONE: Yes.

MR. IMMELT: The same way if you know how much electricity your kitchen is using, you're empowered. You become smarter than your utility. You want that. I've had a utility CO that said consumers aren't asking for a smart grid. Well, in 1984, I was running a sales office for GE when they installed Microsoft Windows for the first time. I wasn't asking for Microsoft Windows, but it made my life better over the last 30 years or something.

MR. GREENSTONE: Right.

MR. IMMELT: So, I think getting the consumers to somehow taste demand, the power of a new energy future is probably, in the end, the only way -- it's either going to happen that way or you're going to have some disaster where a 70-year-old electricity grid in the Midwest craps out for 30 days and people say oh, my God, our electricity grid is 80-years-old.

MR. GREENSTONE: Yes.

MR. IMMELT: Maybe we ought to upgrade it. It's either going to be some kind of sudden disaster or consumer empowerment, but I just don't see the appetite with the deficits we're running and stuff like that for big investments and much of anything right now pragmatic.

MR. KATZ: No, no, that's what we want from this panel because I think one of the contrasts --

MR. IMMELT: I wish it wasn't true. I'd like to sell more stuff.

(Laughter)

MR. KATZ: But one of the contrasts --

MR. IMMELT: But I'll sell it somewhere. I'll sell it in China, Turkey, or someplace else.

MR. KATZ: One of the contrasts in this area is the sense of possibility of the future and then this brutal reality of the kind of policy deficit we have here, which --

MR. IMMELT: I would just add but we need to reposition these things not as the burden you must face because of global warming is that you have to take this.

MR. KATZ: Yes, yes.

MR. IMMELT: That is a loser, right? What we have to say is these are great products, they're going to empower you, they're going to make you smarter, things like that have to be remarketed better.

MR. HELLER: If consumers were listening to this discussion, they'd say we've left you behind. We spent, a couple of years ago, a lot of time worrying about public charging networks and the capital required to do it and the federal-state interplay, et cetera, and then we started talking to consumers, and they said what are you worried about? I get home from work today, I plug in my phone. Today, they would go on and say I plug in my tablet, and when I get my EV, I'll plug in my car. It's not complicated. And so, consumers are way ahead of us in finding their way around these problems. Again, my message would be we can't wait for a governmental policy in this country to solve these things. We need to solve it privately.

Do I worry about transmission insufficiencies? Do I worry about grid issues? Yes, I do, but EV adoption broadly, nationally, will take some period of time. There may be concentrated neighborhoods or cities in states like California, where it actually happens relatively quickly, but good news, the investor-owned utilities, the publicly-owned utilities, especially in California, but nationwide, are in front of this, on top of this. They've communicated with their customers. They're aware, down to the street, where EV adoption. We have a lot of demographic data. So, the private market is, to a great extent, taking care of this high-speed rail, absolutely for it. High-voltage transmission lines from wind farms, who can oppose it? But who can wait for it?

MR. IMMELT: Yes, it strikes me that if you compare this to the last panel, right, electric vehicles are like the iPhone of the clean tech transformation. I mean, and there may be a few other products that fit there. I mean, I've been to sort of Microsoft's imagining lab sort of looking towards the homes of the future, which talk to us. I'm not sure I want to talk to my utility directly, but I want mine talking to my home occasionally.

MR. GREENSTONE: As Jeff was saying, if you can make money selling power to your utility, you'll warm up in a hurry.

MR. IMMELT: But I think it gets to this question of the consumer end of this. With products being sexy and constantly evolving and with brands sort of emerging from that, both in the company and the products so that people are anticipating the next thing, that has a transformative effect in markets. It ultimately should be complemented with smart policy, but you're right, we can only wait so long.

For some of these other things, they are large, collective investments, and maybe the consumer revolution is efficient enough to drive more political palatability for it or maybe we are waiting for that shutdown of the grid. I don't know.

Michael?

MR. GREENSTONE: Yes, I think both Jeff and Mac make an excellent point. Consumers will lead the economy in particular directions. It is also important to keep in mind, I think, the current fiscal situation, and really think hard about what we're trying to achieve with policy and electric vehicles certainly will be an important component of reducing our dependence on foreign oil, and the smart grid may potentially be useful in reducing energy consumption. I think the jury's out on that. But without some direction from government, these changes in consumer behavior are unlikely, I think, to make a significant dent in carbon emissions.

And so, the degree that the problem that we're aiming it is climate change, there really is no substitute for finding cheaper ways to produce low-carbon energy and for price in carbon at end of the day. And, I mean, the electric vehicle will be great for reducing foreign oil dependence, but right now, we're going to plug it into a coal plant.

MR. KATZ: Right, absolutely. So, last point before I open it up, which is we are not Britain. We're not waiting for someone in White Hall to make a bunch of rules. If the federal government does get polarized to the point where they can't move on some of these platform setting things, as Michael describes, how do you all think about the next level down, the states, and what they potentially can do with California obviously being a leader, New England being a leader in some respects, and how do you think even a level further down, cities and even metropolitan areas deciding to leap to the head of the line?

MR. HELLER: Let me go through the list, and it's a long list, and there's a lot of creativity. States and cities are already doing day versus night electricity rates. They're already allowing single driver EVs into the HOV lanes, the High Occupancy Vehicle lanes. They're creating charging posts in state office buildings. They're accelerating permitting process to put a GVEVSE in your garage. They're creating a whole series of amenities. When you drive up to any parking structure, there are a certain number of handicap spaces. Maybe there should be a certain number of EV-only spaces.

So, there are a whole series of consumer facing and grid facing innovations that are going on at the state and local level, and the ZEV credit regime that I mentioned earlier is a very significant one.

MR. IMMELT: And some of those seem completely aligned with the fiscal moment. They are low cost, high impact, market transforming.

MR. GREENSTONE: Correct. States have no more money than the federal government, obviously, so, they generally involve no expenditure of state dollars.

SPEAKER: I agree. I think it can only be positive.

I'd take the other end of the spectrum, the State of Georgia, that probably the only nuclear power plant that'll be built in the United States let's say this decade will be Southern Company in the State of Georgia, and this is specifically driven by the PUC in Georgia and the rate base Supporting Southern, who's a great utility, and that's on completely the other end if there's going to be any kind of renaissance in nuclear energy, they're actually doing something about it.

MR. IMMELT: Right.

MR. KATZ: And, specifically, a company and a state and a PUC that's taking that action.

MR. IMMELT: Right, and it sort of brings into focus these public utility commissions and the utilities themselves, almost like the FCC in the info conversation, which generally are not thought of as the lead --

MR. KATZ: In cabinet agencies.

MR. IMMELT: Cabinet agencies.

MR. GREENSTONE: In California, the day-night charging, the California PUC calls it the EV tariff. So, local and state regulatory authorities are farther ahead than you may think.

MR. HELLER: I actually go back. I basically agree with you. In other words, if you're ever going to move the needle, you are going to have to have a price for carbon or something like that. I guess what I try to think about is what do we all work on in the interim because the biggest mistake the U.S. could make is just not doing anything right now on the clean energy future, and there's a danger of that. So, what are two or three constructive steps that could be taken while there's not going to be anything more significant that happens?

SPEAKER: Yes, I think the state and local governments are playing a role. The State of California has been a leader at basically every significant environmental policy we have, it started in the State of California. But it's a big ask, and I think we shouldn't underestimate that. Because if you cut through all of it, basically we're asking a small set of citizens to pay a higher price for something.

SPEAKER: Absolutely.

SPEAKER: And to the benefit for the rest of the country, and in economics, we would say that's not an equilibrium. People aren't willing to do that forever. And I think this can help provide some signals that will be important for corporations and companies, but at the end of the day, it's not going to solve the problem.

MR. KATZ: Transition point for a comment. So, Bill, do you have a question? Perfect.

MR. ANTHOLIS: Bill Antholis from Brookings.

The question is to Jeff. You sell things everywhere, you make things lots of places, but not everywhere. The places where you're making very high-tech, efficient, clean energy things, have you noticed a change since you've invested in those places in their own attitudes about buying these things? In other words, does Greenville, South Carolina, suddenly become much energy conscious consuming as metropolitan areas in terms of the kinds of things they purchase back from you or others? Or does it not make much of a difference?

MR. IMMELT: Look, I think it's always up to us to connect to dots, but it does. I think our employees' awareness about what they do and what impact it has and the fact that the company has had a big clean energy initiative since 2004. So, we basically decided in 2004, as part of our clean energy initiative, that we were going to run GE under the guidelines of the protocol, that we basically had a specific carbon footprint reduction. And since that time, we've done like 6,000 employee projects that have been from the factory floor on up. We save $100 million a year. Because it's a knee-jerk to say if we have to do all this clean energy crap, our costs are going to go up, that all this stuff means it's higher costs.

And I try to explain, like Wal-Mart's the lowest cost. I mean, I've made a living selling stuff in Wal-Mart purchasing rooms, right. These are hard-nosed guys. If they're driving a waste reduction clean tech revolution in Wal-Mart or GE is, this isn't really about high-cost, fancy stuff in the end. It's about waste reduction, productivity, energy savings, and things like that. So, I'd say our employee base, not just in the U.S., but everywhere around the world is quite in tune with clean tech because we've kind of educated them on it over a long period of time.

MR. KATZ: I've got questions back here. And I know there's some media in the back, reporters have particular questions.

SPEAKER: I have a question for Chairman of the Board of

General Electric, Jeff Immelt. I have a particular question for you. Maybe you know there was a Russian-U.S. agreement on civil nuclear preparation and it was (inaudible) in December, and if I'm not mistaken, your company, General Electric, commented on it on federal register.

What is your position on this agreement? Thank you. If you are aware of this.

MR. IMMELT: I don't know how to comment specifically on that specific agreement. I think the nuclear industry is kind of a sovereign industry. It's really a country-to-country business today, and we'll see how it evolves over time, but it is a sovereign industry today.

MR. KATZ: One back here, yes, and then in the back. Yes. And then we'll move back up again. Thanks.

MR. FELLER: Gordon Feller with Cisco Systems.

I'm interested in the apparent death of the debate in Washington about the National Infrastructure Bank and other initiatives designed to finance both infrastructure and provide the kind of project finance that will help companies in the clean tech space with their Valley of Death problems, and I wonder, Jeff, especially, if you could talk about GE's view on this and where perhaps Coda might differ with your views, given their position in the ecosystem.

MR. GREENSTONE: Again, we think the National Infrastructure Bank is a good idea, providing access for these long tail projects. It gets scored, if you're talking about deficit reduction and things like that, the infrastructure bank gets scored in a particularly negative way, which makes it quite problematic in the debate on deficits and things like that. Now, but we're in a world now that's got a lot of equity. So, I would say it's different today than it was two years ago.

MR. IMMELT: Right.

MR. GREENSTONE: Where there's actually excess liquidity and good financing projects that have outside the U.S. (inaudible) and tariffs and things like that or getting capital today in ways that they didn't get two years ago.

MR. IMMELT: Excellent point.

MR. HELLER: I have little to add to that. Coda was born and grew up during the financial crisis in this country. We'll be hungry our whole lives, and it's not a horrible discipline, and every company would like a proliferation of government policies to aide it, but every company needs to calculate ways to survive on its own.

MR. KATZ: That's great. Good. I've got one back there. There's a gentleman in the middle, and then we'll come over here. Thanks. And then move to the side.

SPEAKER: Thank you. My name is Umay Yama from (inaudible) company, Washington, D.C., office.

The innovation should be eventually eroded by market share of the products, and as Mr. Immelt said, U.S. market is not necessarily the number one market. Now global market is important. To dominate the global market, probably de facto standard for specification for EV probably battery charging stations specification, whatever, may be important, but also to promote the culture of how to use EV may be important. My point is how do you think you would strategically pursue the market share, global market share? Of course, government may be able to help on the policy and the international export initiative, but myself, I think partnership is very important, international partnership is very important to have the dominant share. What do you think about that?

MR. IMMELT: The whole electrical vehicle market is in its inception. So, it'd be like we're getting dressed for the game in the locker room. The game really hasn't started yet. So, this is all out there to be decided. We are convinced that we think it's a good market and one to invest in. We don't know what we don't know, so, we want to try things.

One of the advantages in GE is we've got a big balance sheet and we can try things. So, we decided that we're going to put half our sales force in electric vehicles. We made the biggest commercial purchase in history. We're going to try to put our own charging technology to play in this endeavor, and we're going to let it go as it goes, and then we're going to have some partnerships, and we'll probably try six different things about how if the electric vehicle business structure works.

We're not going to marry one technology. And so, if we do enough experiments right now, they're not all going to be successful, but one or two will be, and this market will play out over the next 10 or 15 years. But we have all these long debates like about nuclear power. In this country, there's never been so much discussed for so little activity. (Laughter) The main product of the industry right now are press releases. (Laughter) It's not actually building plants and things like that. So, I think the key --

MR. KATZ: Those are American jobs. (Laughter)

MR. IMMELT: The key to energy, I think, is you never know the endgame, you have to try things because what gets down to learning curve, it may not always be best in breed that wins. We're in the health care business, best in breed almost always wins in health care. in energy, like the third best idea, well executed, usually wins. Because it's all about cost and access and all those things, and so, that's why I want us to be engaged in a half dozen EV experiments with partners.

MR. KATZ: That's right. How about three questions? I'm going to move to the right. Not a political statement. And then we'll have rapid fire response because I know we have the next panel.

MR. GRIFFITH: Hi, my name is Scott Griffith. I'm CEO of a company called Zipcar based in Boston.

I want to follow Gordon's question. Infrastructure banks sort of went for a whiff, I guess. Something that is probably coming up this year is the highway bill, the reauthorization bill. Do you have any specific thoughts on what can be done or should be done that would be smart policy to move us in a direction on either transportation or energy or just smarter urban living that ought to be in that and considered? Interested in your thoughts on that.

MR. KATZ: Okay, hold that thought. Next question. Just a few more, and then we'll go to rapid fire.

MS. HUDSON: I'm Florence Hudson with IBM, and I totally agree with your ideas of partnerships and ecosystems to derive and deliver new value in this green economy. You mentioned GE and Exxon. We're involved in smarter building coalitions between building management system companies and IT companies to elaborate the data and help people reduce energy use in buildings. There are grid coalitions.

What are some of the areas you wish we would all help to create ecosystems and partnerships to deliver real value for this green economy?

MR. HELLER: There's a substantial need for information on how will people really drive, how will people really charge? A surprising number of cities in this country are actually transportation islands. You tend not to drive. Texas is not that way. California, to a great extent, is that way. Why is that? So, there's a lot of information about how do people drive, how will they drive?

This is Jeff's point, you can't sit here and decide that consumers require 100 miles of range, require 150 miles of range, et cetera. You need to learn about that as you go. If you decided for sure right now, you'll certainly be making a mistake. How will consumers want to integrate their E V with their other electronic devices, be it a nav system, a dashboard of performance of the car, where a telematic is telling me where is the nearest charging station, et cetera. Will people charge at home, will they charge at work, will they charge in front of a 7-11 or a Wal-Mart, or will they charge on the I-5 on a charging station? All these are information gathering functions, and we look forward to working with IT companies to do that.

MR. KATZ: Any response on the transport bill or on this particular --

MR. GREENSTONE: Yes, on the transport bill, we are in this period of fiscal distress, and I think it provides an opportunity for the government to think about problems in the way business people think about problems. And the way we've historically done transport is kind of let it seep out to the political system, let the political system do whatever it wants to do with it. There are no measurements of return, there's no measurement of which projects have high payoffs and which projects have low payoffs. And this transport bill is a real opportunity to use kind of like very low-level cost benefit analysis and the kind of things that these guys do on a day-to-day basis, and that could be a model for how the government should invest in many other areas. But there's a real opportunity.

MR. KATZ: Any thoughts on that particular piece of --

MR. IMMELT: No, I think the highway bill is good answers I'd give.

On the IBM question, I actually think commercial real estate is a great one. The one you brought up. I actually think the more pragmatic energy conservation, the low-hanging fruit, those are places we ought to just be all over right now, and commercial real estate is a perfect example of one where there are big opportunities, very economically-driven.

SPEAKER: Can I jump on that?

MR. KATZ: Yes.

SPEAKER: In this whole drive to reduce energy consumption, there are a lot of myths out there, and what I think we really kind of have to do is separate the wheat from the chaff, and it may be in commercial real estate, there's great returns to energy efficient investments, but, frankly, like there's not a body of evidence to point to. I mean, there are some companies that are able to do it, but in the residential sector, as far as I can tell, there are a lot of claims, but there's not a lot of evidence. If I were in charge, I would set out to try and understand where the returns are high and where they're not.

MR. KATZ: So, we have to move to the next panel. I would just say the sum up of this is that we are going to transition to the low-carbon economy, the clean tech economy in a different way than just about everyone else in the world. It will be consumer-led, it will be company-driven, it will be market evolution, and policy will come in and out of the focus, whether at the national state or local level. So, this is going to be the grand experiment really, and we'll come back in five years and we'll see where we are, vis-à-vis China and Germany and a whole bunch of our other competitors.

But excellent panel, and now we're going to turn it to Peter Singer. (Applause) Oh, everyone should stay in their seats because we're going to move directly to the next panel. Thank you.

(Applause)

(Break)

MR. SINGER: Great. Well, why don't we go ahead and begin? I'm Peter Singer. I direct the 21st Century Defense Initiative here at Brookings, and I'm very excited to be moderating the session on the future of the defense industry as it is part of Growth Through Innovation.

Now, the broader defense and aerospace and national security industrial base is often thought of as the arsenal of democracy, the term that was first coined by FDR back in 1940. And in this role the industry has certainly played a major part in defending America. And that goes from the over 324,000 aircraft that were manufactured in WWII. At the same time, 88,000 tanks were manufactured. These numbers are pretty astounding to think about when you go to the current defense budget debates that are over literally whether we should buy 5 or 10 more jet aircraft, or whether the Marines should have 200 or 500 tanks, versus that 88,000 just a half century ago. But that role continues today to the MRAP vehicles and the Reaper drones that keep our service men and women safe in places like Iraq and Afghanistan.

But the defense industry also is a key engine in the American economy, and most especially as an engine of trade and innovation. To just use one example, if it wasn't for the defense industry's role in everything from GPS, the Internet, and jet engines, we wouldn't have these current global trading networks. We wouldn't have things like Just In Time strategy that's raised so many organizations' return on investment, quality, and efficiency.

Indeed, just a couple weeks ago the defense journal *Jane's Defense Weekly* had an article on the connections between the defense industry and innovation. And it found that the typical major defense firm was spinning out about 60,000 copyrights in inventions. Just one firm. So, this role is really huge.

And for the last year Brookings has gathered a working group of public and private sector leaders and experts to wrestle with the questions of the future of the defense industry. And different from the normal approach of how these things are discussed in Washington, we didn't focus in on whether a single program should be bought or not. We didn't look at this year's budget or not, the way it's normally discussed. We didn't put it within a partisan framework. These leaders and experts gathered around the longer term, nonpartisan questions, to try and identify what were the key policy issues ahead.

And the three ones that they zeroed in on were these questions. First, what's the long-term future of the overall U.S. defense industrial base, and how might it evolve over the next decade? Second, what are the connections between the industry's future and the broader issues that are sometimes looked at as domestic issues of trade, export, education, immigration, visa policy. And then finally, what have been the keys of success in innovation within the defense industry, and how could these be applied to the broader economy?

And so what we're going to do today is actually take those questions identified by this private working group and wrestle with them here today by some great leaders. And really, we've got a fantastic lineup to delve a little bit deeper into these issues.

To my right I have David Cote, who is chairman and CEO of Honeywell, a technology and manufacturing leader that provides everything from the engines that power the M1 Abrams tank, to the thermostats and control technologies for buildings, homes, and industries. Notable to the prior panels, approximately 50 percent of its technologies and products provide energy efficiency benefits.

Previously he's worked at TRW and GE in various manufacturing and finance and management positions. Also of note, he serves as co-chair of the U.S.-India CEO Forum, and he's a recipient of the Corporate Social Responsibility Award from the Foreign Policy Association.

To his right we have Walt Havenstein, who is CEO of SAIC, a scientific engineering and technology applications company that does everything from run the modeling simulation and analysis for the U.S. Army Space and Missile Defense Command to helping utilities build smart grids. Again, connecting across these different panels. Prior to joining SAIC he worked at other major firms in this industry, like BAE, where he was a COO, Sanders, Raytheon, and ITT.

Of note, he's also chairman of the board of FIRST, which is an organization -- FIRST stands for For the Inspiration and Recognition of Science and Technology. This organization is designed to inspire young people to find interest and then participate in science and technology. They do some fantastic work.

And finally, he's a graduate of the U.S. Naval Academy. He served in the U.S. Marines on active duty for 12 years, and then on reserve, retiring as a colonel.

And then finally we're joined by my colleague Michael O'Hanlon, who is director of research and foreign policy studies and is senior fellow in the 21st Century Defense Initiative. I'm biased, but Mike is one of the true legends in the field. He's the author of 17 books on national security, including his most recent, *Toughing It Out In Afghanistan.* And I actually went to the Brookings website to count this. He's authored 567 magazine and newspaper articles. That number is actually, I believe, more impressive than the U.S. manufacturing 300,000 airplanes in WWII.

Before joining Brookings, Mike worked as a national security analyst at the CBO. And he also continues to serve as an advisor to the U.S. military central command, and the State Department's International Security Advisory Board.

So with that, what I'd like to do is actually go down the panel. And. Dave, turn to you first to weigh in on this first question of what do you see as the long-term future of the U.S. defense industrial base? And where it might evolve over the coming decade?

MR. COTE: Okay. I have a number of observations, but I'll try to group it into three or focus on three.

The first is, we have to resolve our debt issue. Now, it sounds -- it may sound counterintuitive, because we're here to talk about the defense, but as you probably also know I was on the President's deficit commission. And when we look at the role the debt is going to play over the next 10 years, it's going to have a significant impact on the defense industry. Not just in how much we can spend, but how we're going to go about spending it.

And if you take a look at where we are currently on the current path that we are on, we're about -- debt about 60 percent of GDP today, public debt. Over the next 10 years it grows to 90 percent of GDP. About a $20 trillion debt, and we'll have an annual interest bill of about a trillion dollars a year.

Now, we talk about millions, we talk about billions. Trillion just seems like another number. So the way I've taken to describing it to get people's attention was that if you had spent a million dollars a day since Jesus Christ was born, 2010 years ago, you would still not have spent a trillion dollars. That will be our annual interest bill.

We have -- we are clearly on an unsustainable path. And I think it's as Ben Stein said it, if something's unsustainable, it will stop. And there's two ways it will stop. The first one is, we can do something about it now, thoughtfully, and proactively. The second is, we can wait until the bond market forces us to do it, like you see with Portugal, Spain, and some others.

You're not a world power if the bond market forces you to do something. And that's going to have as big an impact on the defense industry as anything that I think we're faced with.

A second one: need much greater speed, flexibility, and we need to be less costly. And we take a look at just all the routines, the processes, the systems that are put around everything today. And we have a system that is not fast, it is not flexible, and it is not inexpensive. And those are three dynamics, in my view, that are going to have to change a lot going forward. And you think about the quadrennial defense reviews, the QDRs, that have been discussed in the past? They all talk about the need for speed, flexibility, asymmetric threats. And we still don't have a system that helps us there.

And you just look at all our procurement processes. And it seems like we're more than willing to spend $100,000 to make sure that the $10,000 problem never happens again. And we've got it totally backwards. We need to become a lot faster, more flexible.

The third area that, in my view, is going to become increasingly important for us is just number of engineers. If we take a look at where innovation is going to come from, it generally comes from engineering, it comes from technology. If we take a look at the number of graduates -- engineering graduates that we have today, the U.S. produces about 450,000 U.S. graduates in engineering. China today produces about 900,000. And they have a third the percent of college-age kids going to school, because the system is still catching up. When they get to that same percentage we do, they will be producing 3 million engineers a year versus our 450,000.

We need to start thinking a lot differently about how do we encourage technology, math, science -- how do we encourage this? In my view, we need kind of like a Sputnik-type effort that gets people mobilized and thinking again about all kinds of engineering. And we have enough lawyers. You know, we don't need more lawyers. We need more engineers. And that's a dynamic that's going to need to change, in my view. Not just for the defense industry, but for the country in total.

MR. SINGER: Thank you. Well, a capstone to that -- an interesting number is that in 1986 compared to today we graduated actually less engineers and folks that majored in information technology. But since 1986 we've had a 500 percent increase in students who majored in leisure and fitness studies.

So, Walt. This actually -- this last point --

SPEAKER: I feel more competitive now. (Laughter)

MR. HAVENSTEIN: Is that the segue to me? Leisure and fitness side?

MR. SINGER: No. In terms of -- you actually have a special interest in this area of education. But also, I wonder if you could weigh in on not just education, but how trade policy and maybe other issues connect to this future of the defense industry.

MR. HAVENSTEIN: Yeah, I'd be happy to. First of all, I certainly would reinforce Dave's thinking here, and especially in the context if we're going to have to deal with a more constrained budget, and it remains to be seen whether that defense spending is going to look flat.

As we heard last week, we're out in -- the out years is actually going to go down. The reality is we're going to have to leverage more and more, and we've been doing that in the industry from the commercial industry.

We had an earlier conversation, it was very interesting, in the first panel. The big conversation around spectrum. All right? Well, spectrum is an interesting dynamic in 2011 as a commercial resource. It has always been a tremendously critical resource when it came to defense.

Defense industry was using mobile -- was providing mobile communications 60 years ago. All right? And we were always in the context of contending in the spectrum. As we have to contend -- and our military forces have to contend in that spectrum even more so, we're going to have to rely more and more on the technologies and capabilities that come from the commercial sector to help solve those problems.

And that's not to say there aren't always going to be essentially military-only capabilities. There aren't a lot of people that operate nuclear power plants a couple thousand feet down, right? And in a very stealthy environment. So there's always going to be the need for explicit military and defense capabilities. But more and more, as we have over the last decade, we're going to be shifting more and more for information technology purposes to a warfare that necessarily is more dependent upon that resource. And so we will be more dependent upon the commercial solutions.

At the same time, we have to leverage the fact that we can export some technology that may not be as critical today as it may have been 15, 20 years ago. And I think our technology export policies have lagged. The speed at which technology not only becomes available, but becomes relevant and becomes not relevant.

And so I think as an industry we have encouraged government to review their ITAR policies, review the critical technologies that, no fooling, represent a future threat as opposed to what may have been a threat 10, 20 years ago.

Let me just talk briefly about education. I'm going to do a shameless shout out, first. Norm Augustine, many of you know. An icon in our industry for many, many years, still is today, five years or so ago issued a warning order on our education system and the state of our technology-based workforce, and just recently updated that gathering storm. And he characterized it, now we're in a Category 5 environment.

The issue isn't how many young people are graduating with a technical degree, per se. It's how many U.S. citizens are graduating with a technical degree for our industry. It's one thing if you're going to develop code for an iPad or an app for Apple. It's another thing if you're trying to develop electronic warfare systems or you're trying to develop material sciences for stealth. Very, very different. And the nature of those differences demand, for the most part, U.S. citizens. That's what we demand.

It is encouraging to see the amount of interest there is today around educating young people and getting them motivated in science, technology, engineering, and math; getting them motivated early enough in their life so they are willing to fight through the discipline that comes with taking algebra and calculus in high school. The discipline to actually say, gee, I am going to suffer through physics when I'm 17 years old so I can actually be qualified to take technical courses in college.

A lot of us in our industry have put a lot of emphasis on higher education at the university level and higher. But I got to tell you, it starts somewhere between dinosaurs and puberty. If you don't capture young people's imagination like my imagination was captured during the space program when my dad was with NASA and I got to go down to Cocoa Beach, Florida, and watch -- during Easter break and watch rockets go up in the air, most of which blew up. I thought that was cool. Apparently it wasn't. (Laughter) But the idea of being part of that inspired me to think that was cool. Right?

Monday night, most -- I bet a good many of you sat around the television until midnight watching the University of Auburn and -- who did they play?

SPEAKER: Oregon.

MR. HAVENSTEIN: Oregon. (Laughter) We have got to change the emphasis of what we celebrate in this country, starting with our young people. I would tell you, on Saturday we kicked off the 20th season of FIRST robotics competition. This year, 90,000 volunteers, several hundred thousand young people from the age of 6 through 18 will be participating in robotics competitions throughout the country. With the -- and it is nothing more than a varsity sport of the mind.

And the day we can walk into our gymnasiums, instead of seeing won the ACC, you know, basketball championship 2011, 2012, and see something like won the regional FIRST competition, won the national competition, we start creating a cultural shift. That's exactly what needs to happen.

What Dave described as a *Sputnik* kind of -- we are a worse situation today than we ever were when it came to the space race. And frankly, the reason I support FIRST -- and back to the -- it actively engages me, parents, teachers, the community, my engineers, the way football does in our booster clubs in high schools and junior high schools. And it has the best chance of changing culture.

That's my shameless shout out, all right?

Oh, by the way, if you have somebody going to college these days and you think about return on investment, put it in economic sense for you, and they end up in your basement? The year after they graduate? You want to be asking yourself, was that a wise investment?

We can hire virtually every engineer and scientist we produce that are U.S. citizens. Between our industry and the industries you saw in the last two panels. The fact is, we're going to need to hire a lot more of them. So, I would certainly encourage that as one of the critical issues facing our nation, and certainly facing the defense industry.

MR. SINGER: Thank you. And again, I actually was able to research FIRST in some of the work that I was doing for my book, and I find it striking that it's looked at as a sports competition. But also when you speak to a Bill Gates, he says that if he was young today he wouldn't go into computers, he would go into robotics. So these kids that are participating in FIRST right now are sort of the next generation of the Bill Gates of the world. And we better do a good job of supporting them, as I weigh in on this.

Mike, I wonder if you could handle this broader question of innovation in the defense industry and some of the lessons there, and how it might apply to the broader economy. But also, maybe comment on some of these issues that have been raised in terms of debt, education policy, et cetera.

MR. O'HANLON: Thanks, Peter. And it's a real thrill for me to be a part of this panel. I know we had Sean Penn here at Brookings on Monday, and he was very good. But for me, the superstars of the week are here today. And maybe that reflects my biases and my preferences. But as you say, we've got to change a little bit the definition of cool in the country. Although Sean Penn is cool, you guys are, too. And it's a real treat to be part of this.

I think I want to comment, as you say, Peter, on some of the other issues that have been raised as well, very briefly. And one thing would be to pick up on what Walt and David have said a little bit and emphasize a flipside to it, which is not to disagree but to remind ourselves of our strengths. Because we have a lot of challenges. With the debt, with the deficit, with inadequate science and technology. With a cultural shift, perhaps, towards other things besides the hard sciences. And all these things do present challenges for our country.

But it's worth remembering that we don't need to throw up our arms in despair or feel like we're inevitably getting beat in the great competitions of the 21st century. It's true that too many of our graduate students are foreign nationals who then go home to their countries. But it's also true that by most measures, most independent assessments, we have maybe 58 or 60 of the best 100 universities in the world. That's a pretty nice place to start. And, you know, even in the hard sciences, half of the graduate students are American, roughly, in broad terms. That number needs to go up and we need to incentivize more foreign graduate students to stay here once they're done. But this is a pretty good place from which to begin.

In terms of aggregate research and development across the economy -- and I'm including here defense and non-defense sectors -- in aggregate, the United States is still the R&D center of the world. That may seem a little funny and counterintuitive to everything we read and hear about, but in terms of where most innovation happens -- or at least where a large fraction of innovation happens, and in terms of where the most resources are devoted and spent, the United States still out-distances the European Union in aggregate or, let's say, East Asia in aggregate.

And again, the trends should cause us some concern. The trends are towards convergence or our losing our edge. But this is -- it's important to remember what our strengths are because if we get too depressed about how things are going, it may be tempting to just say, let us be the world's lawyers and entertainers and let somebody else build and go invent all this stuff. Well, other people are building more and more of this stuff. We're still inventing a lot of it and building a moderate share. Even as manufacturing, of course, has declined greatly as a percent of GDP we still make some pretty interesting things.

I just say that as a reminder that we need significant course correction, but not a radical change. And we must not forget what our strengths are, either.

Now I want to talk a little bit about other strengths that the defense sector and the defense industry in the United States has displayed over the years and still has -- and this is a little bit of a shout out to our colleagues on the panel and in the audience. And again, it's not necessarily to draw perfect conclusions about the future, but just to set the table for the conversation we're about to have. And to remind you all of how much defense and non-defense sectors benefit from each other and have done so, historically. And I'm just going to very quickly tick through half a dozen areas in which defense has really spun off technology in the last 50 or 60 years, especially in the Cold War period. But also areas where defense today can still offer some lessons in innovation to respond directly to the question that Peter posed to me. And then, wrap up and look forward to the conversation.

First of all, as you all know -- and Peter mentioned this earlier himself -- defense has done a great deal to drive the history of invention, innovation, and development in sectors like aerospace, where everything from jet engines to helicopters to rockets basically were invented in the defense world, and in many cases improved, perfected, as well. And this has been something we've seen throughout the '40s, '50s, '60s, and thereafter. So, aerospace and big vehicles in aerospace is one big area of innovation where defense really has driven a lot of what's happened here in the United States and globally.

Another area is in sensor technology. And here we can cite the examples of the development of infrared sensors, certainly the development of radar, to a large extent the advancement of laser technology, little things like airbags in cars benefiting from some of the sensor innovations that came out of the U.S. munitions industry. And so a whole broad area of impressive spinoff from defense towards civilian sectors has historically been in the area of sensor technology as well.

And then it's worth mentioning space. I already alluded to rockets, let me mention satellites as well. And of course, this was an area where defense really drove a lot of what was happening in the '50s and '60s. Now, you had this happy synergy of sort of in a funny way the Cold War plus the *Apollo* space program, which reinforced all these trends in space and meant that it wasn't just the defense sector but it was this modern day -- or, excuse me, earlier day, you know, grand national mission in science that David alluded to earlier that's been so central to generating the interest, the excitement, the resources. So it was both civilian and defense sectors that drove a lot of the invention and innovation in rocketry and space. But that's one other big area.

So this just proves the point that defense can do a lot. But for those of you who say I'm talking about ancient history and the tables have shifted -- and we even heard a little bit about that from a defense CEO a moment ago about how we have to keep looking within defense circles for benefits from the commercial world -- and that's true -- let me also remind you that much innovation today is still coming out of the defense sector, and the companies represented on our panel can exemplify that. And I'm sure my colleagues here can explain that in greater detail than I can, but let me mention areas like cyber -- not only the performance of computer systems, but cyber security, which is now so central to much of our economy, and where the defense intelligence and homeland security sectors are doing a great deal to drive innovation and drive technology.

It continues to be true in aerospace. Maybe not so much in building stealth or in sort of pushing the flight envelope towards maximum speeds, as with an F-22, but certainly in terms of innovation with composite materials, innovation with trying to make engines more efficient, innovation with tanker aircraft, transport aircraft. Certainly Boeing and many other companies that are involved in the aerospace sector continue to work in these areas and drive a lot of progress. And certainly SAIC and Honeywell, also.

Just one or two others then I'll stop. Command and control networks. Where we have seen the military become so good in the last 10 to 20 years at integrating various intelligence sources in real time and doing real time data fusing. Now, certainly the commercial sector is good at this, too, and has a lot of incentives to get better at this. So I don't want to suggest it's a one-way street where defense is primarily generating the invention and where the commercial industries of the country are benefiting as recipients. It's certainly a two-way process.

But it's been impressive just how much real time information fusion dissemination has happened within the military in the last 10 to 15 years as we've taken the time from which we identified a target and then we're able to attack it, which used to be measured in days even in the 1980s and the early parts of the Persian Gulf War in 1991, especially with much of our naval technology of that day. We had to, as you may recall, fly out our flight plans overnight to aircraft carriers. And they were based, to some extent, on imagery that had been taken days previously.

And this was at that point in warfare, a real-time, fast kind of targeting adaptation. Because our Cold War war plans were all based on, you know, the kinds of long-term intelligence gathering and analysis that we did over months and years, and then worked into the nuclear war plans and revised them maybe once a year. But by Desert Storm you were trying to revise things in a matter of days. And then as you got into the 1990s and the Balkans wars, there was maybe a process or a delay of hours or maybe one hour between when you would spot a new target and you could attack it with somebody else. And now we're getting to the point where it's minutes. And so certainly this kind of fusing is very interesting and important in the defense world.

Last point. It's not just the technologies, but it's the linkages between the technologies and the people. And here let me give a shout out to General Stanley McChrystal and to many of the people, especially down-range in the war theaters over the last decade, who have figured out ways to essentially flatten our corporate hierarchies and benefit not just from new technology, but form a tighter form of teamwork. And I think here, the defense sector broadly defined -- not just industry but also some of our operators in the field in uniform have taught a lot that can probably be of benefit to corporate America and to the civilian economy as well.

So I've just begun to tick off a few of the examples, Peter, but I'll stop there.

MR. SINGER: Thanks, Mike. Dave, before we turn to the broader audience I want to give you a chance to weigh in on some of the other comments that have been made here. Any thoughts that you want to react to?

MR. COTE: Yes. I'd say first one, I'm enough of a sports fan that I would like to see that robotics award hanging next to the state championship in basketball. (Laughter)

But I would like to reinforce Walter's point that -- I went to my 40th high school class reunion. And, yeah, yeah, yeah, you can give me grief about how old I am now. But anyway, one of the things that I've said to a lot of people is that one of the things that struck me as I saw the spirit awards, I saw the anti-bullying posters, I saw the art exhibit from the art class. And I've said to a lot of people, nowhere in my own high school did I see anything having to do with math and science competitions, awards, or anything like that. And I found it bothered me, because thinking back I actually think we had some of that at one point and we don't any more. And I really do, I agree. I think that's a fundamental dynamic that we have to change.

Second item, I think we can look at defense more broadly than just how do we defend ourselves against attack. I mean, one of the ways to prevent attack in the first place is by building trade ties. Some call it commercial advocacy. I'm a big believer in that to the extent you can keep the discussions commercial and arguing about currency, that's a lot better than trying to figure out whether you need to send ships.

And there's a lot of simple things you could do. I mean, China is the one that everybody likes to be nervous about. And you get asked, are they a partner? Are they a competitor? Are they a supplier? Are they a customer? The answer, of course, is yes, they're all of those. But we need to have a more nuanced, thoughtful process for addressing how do we think about China.

And I'll give you a good example is Chinese companies buying U.S. companies. We should be in favor of that. Because to the extent that you now have a Chinese company back in Beijing saying, hey, hey, what are you doing? I have a lot of money over there -- you get a different dynamic. And you think about some of the -- I've oftentimes said that discussions down here surrounded by the three H's; hysteria, histrionics, and hyperbole. And you think about -- go back 20 years ago when the Japanese bought Rockefeller Center and the outcry that you saw in the press amongst politicians and others because they had the audacity to buy Rockefeller Center and what a threat that was to the U.S.

Now you only have to take a moment to think about so how big is this threat? What are they going to do with it? Take it to Japan? (Laughter) Nothing. Now you have the land and you have the money. But for some reason the three Hs dominate that conversation and it shouldn't. Commercial advocacy, greater trade ties, keeping things commercial discussion rather than a military discussion, I believe, could do a lot.

And just kind of pursuing Michael's point a bit on how we do have a lot of strengths. We do. But when I think about the three Hs you really need -- it seems like democracies are uniquely suited to putting up the traffic light after the fourth accident. We've already seen the first accident. Unless people start screaming and getting attention, I swear it's tough to move a democracy. And unless we start surrounding some of this with those three Hs, I don't know that you get the country to move. It's kind of an astounding part of how we operate, but we really need to start mobilizing more attention to build on the strengths that we do have, which I would agree I think are considerable.

MR. SINGER: Walt, would you like to weigh in on anything not using the three Hs? (Laughter)

MR. HAVENSTEIN: Well, let me just add to what Michael was saying about the innovations that still come out of our defense industry. They are vast. Many times, kind of below the waterline in terms of visibility to the public.

The command and control that we apply to solving smart grid problems are almost identical to the nature of command and control that we solve to knowledge-based applications of targeting and weapons, right? And so there's a lot of nuance in that leveraging of technology from defense.

There was a question earlier in the day, and it had to do with privacy. It had come up in a conversation in the panel with IT, and how do we have privacy -- what I'll call information assurance around this vast network that's now ubiquitous in everything we do?

Well, a lot of the more what I'll call exquisite solutions to that problem have been worked on for decades within the defense industry. And I would suggest to you that over time many of those solutions that were historically leveraged to solve problems in the dot-intelligence or the dot-mil community and, subsequently, in the dot-gov community, are going to migrate necessarily both in policy and in practice into the dot-com world

-- the dot-com/dot-org world.

And it may not be as evident to you, but I can assure you that's what's going to happen. I can assure you that when AT&T as an Internet service provider thinks about securing the network, right? To solve the problems of privacy and to solve the problems associated with information assurance, they're going to look for many of those solutions to adaptations of solutions we've created in the defense industry.

MR. SINGER: Great, thank you.

We've got a little bit of time left for conversation. So -- and actually we've got our first hand back there. And if you could wait for the mic and stand and identify yourself.

MS. STERN: Okay, thank you. I'm Paula Stern. I used to chair the U.S. International Trade Commission, but I'm here asking a question on behalf of the National Center for Women and Information Technology.

The whole question about innovation and the fact that we don't have a pipeline that is supplying those jobs that you said are going begging, particularly in the computing science, information technology area. My question goes to your panel as a defense panel because national security has always, in our democracy, managed to trump a lot of other issues. And out of DARPA and out of other defense budget, we have incubated a great deal of innovation through money spent on training and on education.

My question is, what should we be doing today, 2011, in terms of the Defense Department? The Office of Naval Research, as I understand it, has kind of been ahead of the game on some with STEM education, but we still don't have a curriculum throughout our country that teaches computing science. And in this Tea Party period, I'm wondering whether we're going to be able to tackle this innovation deficiency through the education door and whether we might need to go through the defense door.

I'm wondering if you would comment on that.

MR. HAVERSTEIN: I'd be happy to comment. The defense industry and our associated partners in government, I think, are equally committed to that initiative. The initiative how do we incentivize or at least recognize the need and then help through training and development?

We certainly do it in the military, right? Probably the most intensive training environment of any profession. And we certainly do it in support of technical capabilities.

I think the distinction is, what active role does the Department play versus what supporting role does the Department play? And I happen to be -- having come from New Hampshire, right? Live free or die is well and thriving in New Hampshire. I believe that is the role of the DoD is to support the initiatives that we take in industry and in partnership in our communities, right?

At the same time, I would -- I'm going to use the example I know, and that is FIRST, where bases and schools at those bases can adopt those kind of programs. And as long as they are encouraged to do that, I think that is an appropriate role for the Department of Defense, as opposed to the Department of Education. Okay?

MR. O'HANLON: If I could add to that. I know government efficiency is everybody's favorite oxymoron. And it applies to these STEM programs, also.

If you take a look at -- Senator Coburn has actually done some great work here. And I tried getting to the bottom of some of this in some of the Deficit
Commission work that we did, because we wanted to -- Andy Stern and I in particular had a lot of discussions about how at the same time we needed to reduce expenses we needed to invest more in overall infrastructure, not just roads and highways, but education and everything else.

When you get to the bottom of some of this, there's something like 110 different STEM programs, none of them coordinated. And nowhere is there a measure of effectiveness on are you getting something for the money you're spending? Nowhere. And I tried for a month or two to try to get this kind of data. And we actually had Senate aids trying to get us data. Nobody measures this stuff. And we need a more thoughtful process, again, a discussion. And it's not -- it seems like if you try to talk about STEM there's always -- again, the three Hs.

Somebody to say, well, you're completely against education. It's like, no, I'm actually in favor of very thoughtful education and spending to get what it is that we want.

There's still a lot more opportunity in STEM in particular to generate much better measurable results than we see today.

MR. SINGER: I just wanted to give an example that might help answer that as well. In this working group that we've assembled, we looked at the idea of crowd-sourcing, which is done in social networking, and how that might be applied over to the questions within the defense industry. And the example that's often pointed to is DARPA's Grand Challenge. Where the Pentagon, spending billions of dollars, was not able to build an autonomous robot.

It put out a $2 million prize, which to people outside the DoD seems like a lot of money. Within the DoD, that's the copy machine budget. And for $2 million they got hundreds of high school and university teams that competed in this program. And it was won by a team from Stanford, MIT, and, actually, the IT department of an insurance company from Louisiana, for $2 million. And what's interesting, the idea of spinning out innovation. That Stanford team that won, the technology is not just being used in Afghanistan today by soldiers, it's also being used by Google and also by the various Smart Car programs and the automotive manufacturers. So, we should be looking at more of these crowd-sourcing projects that are relatively cheap.

Let's get another question from this side, here. Anyone over here? Back there. Yes.

SPEAKER: This is for you.

MR. MEHAM: My name is Josh Meham with Romulus Group, a consulting firm. And my question is, I guess, for anybody, but it might be most appropriate for Mr. Singer.

I'm a very big fan of *Wired for War*, and one of the questions that seemed to come up -- and I'd be interested in everybody's take, I guess -- is, what exactly engineers and what exactly these people who are interested in defense and get the appropriate education should actually be doing? I mean, what is it engineered to do, what?

Like, I have a lot friends who took a lot of science classes and are working on their PhDs now, and it's a question. So, what exactly am I putting my degree toward? And related, though, what comes up in the book that I think is really fascinating is, so what about the other side when we talk about, so, what are the values that are sort of motivating these things? Because I imagine in either of your companies, there would be no question as to this is where we stand and this is why we do what we're doing. But in terms of a national agenda and what defense is for, there seems to be less of that.

And so I'm curious as to when we talk about China, for example, and we talk about these other countries and where defense fits, what is sort of the stuff that we're looking for and what we should be thinking about? So, I guess that was a lot.

So the two questions are, so we need engineers to do what? And on the other side, what should we be thinking about ethically, politically, and et cetera to manage this? So, yes. Thanks.

MR. SINGER: Well, I'm a social scientist, which really means I'm not a scientist. (Laughter) So, I actually want to turn to our panelists to weigh in on that.

MR. HAVENSTEIN: Two things, right? To your questions.

Solving hard problems that are of national interest, right? And in the context of the aerospace and defense industry, solving hard problems that protect our freedom. Those are really two simple values that you can relate to young people. You're going to solve hard problems that are of national interest. They may be of global interest.

You solve -- you know, no matter how much you pay him, a basketball player at Miami is not going to find a cure for cancer. Not going to happen. If you want to find a cure for cancer, you better understand science and mathematics. That is a compelling issue even for young people. That's a hard problem, right?

Keeping our nation safe is not a trivial issue, either. And so, whether it's SAIC, Honeywell, BAE Systems, Rockwell Collins, Northrop Grumman, Lockheed, fundamental to what those companies do is solve hard problems of national interest or global interest.

And I think those are the compelling conversations I'd have with a 17- and 18-year old, right? We're not building a robot at first. We're finding a cure for cancer. We're creating the next global infrastructure. We're going to figure out how to do the next Metro better. And everybody in this room knows there's a better Metro to be built, right? That's what they're doing.

MR. SINGER: Real quickly, I just think that to echo that, the priorities that the military has today when you apply to engineering, as we've heard particularly from this panel, connect to the broader priorities that I think we see in the economy and the nation as a whole, whether it's the demand for green energy, which the military is a prime mover in that because it's the biggest spender on energy today, to, as you've heard from Mike, the ability to fuse together data and make quick decisions, which is something that the military needs to be able to do, which a manufacturing company needs to be able to do.

We've got time for one last question. Right here in the front.

MR. JORNE: Bill Jorne is my name. I'm involved with an effort to create some telephone apps, cell phone apps, in emerging and developing countries.

But my question to this panel is -- and you've hinted at it a little. But knowing what you know without giving away any confidential information, are you willing to speculate on sort of the next generation of products from the government that are going to be, let's say, able to be commercialized in this area?

MR. O'HANLON: Not me. (Laughter)

MR. SINGER: Anyone else want to weigh in?

MR. COTE: I guess you stumped us.

MR. HAVENSTEIN: Yeah, I think you'll see some sensor technology. Back to what Michael was saying, there is without a doubt advancements -- you get them today, right? When you hit Google Earth, right? The nature of the sensor -- the overhead sensor that delivers that little picture that's Google Earth? Its genesis was in the defense industry and its enabler was the sensor, right? And I think whether the full range of the electromagnetic spectrum where defense industry excels in development of technology and capability, you will start to see those new kind of sensors pop out.

Now, you may not recognize it as that, but it may be the three dimensional view from space. That's how it commercializes itself, right?

So I think those -- I think the sensor technology will continue to be spun out as commercial applications, right? You see those technologies in your GPS. You don't say, gee, I wonder how that works. You know? Most of us don't care, right? But everything from the display itself, right? The up and down links to the satellites, the algorithms that correlate the various different pieces that come from the satellites is all done -- is all government-invested technology through the defense industry that migrated to -- frankly, migrated to commercial sector.

I think you'll see more and more and more of that.

MR. SINGER: The quick answer I would give on that is, it's the adjective "smart." We hear -- Mike talked about smart weapons. We heard about previous panels talking about smart grids. And I think we're hearing one of the evolutions of the sensor is smart sensors. That adjective, I think, applies to the discussion that we've been able to have today, which has been a very smart discussion and a very enriching discussion.

And we at Brookings are told to drive home on not the three Hs, but the three I's, in terms of ideas and impact and independence. And I think this panel really does show that. It's been a good anecdote against the three Hs. So please join me in a round of applause. (Applause)

(Recess)

MR. ANTHOLIS: Welcome back. I hope everyone had a good lunch. We're going to pivot now. We've been talking about innovation in the private sector to innovation in the public sector. From Greece to Germantown, Pennsylvania, local, state, and national governments are all facing budget crises, and, without question, this is the greatest thing that's driving innovation in politics. Yet, as we heard on the first three panels, we're also facing infrastructure and other investment deficits that are holding us back from competing internationally as a country.

So the question for all of our panelists, really, is how to do these two twin challenges at the same time: get our fiscal house back in order while not underinvesting in the things that make us competitive?

And we're going to start today -- I'll introduce the panelists in a second -- but we're going to start I think with a question that is less known well in Washington, which is the crises facing states and localities. States have to balance their budgets, yet state after state face significant shortfalls. Pennsylvania, which is represented today, faces roughly a 4- or $5 billion shortfall -- I'll have the governor explain that to us in a second; New York, roughly 9; Texas, 14; and California at least $18 billion and perhaps upward to $25 billion. These are enormous challenges.

States' revenues in particular are sensitive to economic fluctuations and in particular the rise in entitlement costs and public pension costs plus Medicare and Medicaid, and because states can't run deficits it often forces pragmatism over political polarization. So at the national level the things that states have to do on an annual basis we've been able to roll into longer-term deficits. And the question is whether or not those are sustainable and will force a meeting of the minds in a very polarized Washington.

So to address all of these issues we've assembled a really terrific panel that I'm delighted to have, starting with Governor Edward Rendell, who for the last eight years and until next Tuesday, has been and will be the governor of Pennsylvania. That's 2,913 days down and 5 or 6 to go.

GOVERNOR RENDELL: By this count.

MR. ANTHOLIS: By this count. We do data here.

Alice Rivlin to my right, who has held the two top jobs in the federal government at either end of Pennsylvania Avenue, a lot of addressing budget issues: the Congressional Budget Office and the director of the Office of Management and Budget. Less well known, perhaps outside of this building is that she's been a senior fellow here at Brookings off and on for four decades, and she's been a member recently of both the President's Commission on Fiscal Responsibility and Reform and co-chair of the Bipartisan Policies Debt Reduction Task Force with Senator Pete Domenici.

To her right is Senator Evan Bayh, who for the last 12 years has been the senator from Indiana until just last week, and before that was a governor for 8 years. And it's hard to imagine, just as it's hard to imagine looking at Alice that she's been here for four decades, it's hard to imagine that he's been in public office for that long. But he started pretty shortly after he graduated from the University of Virginia's law school, in which I take particular pride.

MR. BAYH: I thought you were going to say high school, Bill.

MR. ANTHOLIS: Yeah. (Laughter) To his right, literally and figuratively, is Ron Haskins, who is another senior fellow at Brookings who served on the majority House Ways and Means Committee staff during the years when Newt Gingrich was Speaker of the House and when Speaker Gingrich and President Clinton were able to work together on a number of different issues, including welfare reform which Ron was instrumental in. Ron is also -- was a senior advisor to President George W. Bush on welfare policy and other things. He's written quite a lot about deficit reduction and government reform and efficiency.

And then finally, to the far right Ann Brookings -- Ann Fudge, who is a Brookings trustee, which means unlike everybody else on this panel, technically at some level she's my boss. And that's a good thing, Ann having run terrific outfits like Kraft Foods and Young & Rubicam brands. And Ann also served on the President's Deficit Commission.

So with that, starting with Governor Rendell, you've been not just a governor, but also a mayor and a national party chairman. Connecting the federal to the local in the 2009 stimulus package went a long way to helping distressed states and localities deal with the immediate budget shortfall from the financial crisis. But that money's not coming back, at least not in the enormous amounts that came in those first two years.

How do state and local leaders do this? How do they address both the budget deficit but also the investment deficits that they're facing?

GOVERNOR RENDELL: Well, let me answer that by going back a little bit in time to when I first became governor. In the first six years that I was governor we had good times, good growth, growth averaging around 5 percent. Every percent of growth for Pennsylvania is an additional $260 million of revenue, and I took that additional revenue at savings that we were able to effectuate in the cost of the operation of the government, and I spent it.

I don't apologize for spending it. I believe government should spend money on worthwhile things like the physical infrastructure or intellectual infrastructure, protecting our most vulnerable citizens. I spent it and Pennsylvania is by far the better for that spending. How did we save that money? Well, we took out, and once the recession that we continued this, but we started taking out things from the cost of the operation of the government. Today we spend almost $2 billion a year less on the operation of the government, the overhead of the Pennsylvania government, than we did in 2002.

In terms of raw numbers, not adjusted for inflation, our GGO -- General Government Operations -- is less than it was in 2002. We did it because we applied the same things that we did in Philadelphia: We looked at every government program and said eliminate it if it's not good; if -- even eliminate it if it's good but it's not reaching the mark. Find a way to do it better.

Let me just give you two quick examples, and then I'll go to the "what's next" concept. We sourced our purchasing. Believe it or not, when I became governor, Pennsylvania had 800 separate contracts for office supplies. By sourcing that and bidding it out to one company, just in that alone, we saved $11 million. Eleven million dollars a year overall by leveraging purchasing, and Pennsylvania purchased over $3 billion, a little under $4 billion of goods and services. By sourcing our purchasing, we saved over $300 million a year on an annualized basis.

There's a Center for American Progress Study that said if the federal government did the same thing, it could save $40 billion a year. And given what the federal government invests in purchases and spends, that's probably not far off the mark. Common sense things.

We had six computer contracts. We sourced them, bid them out, Dell won. We saved $17 million on computers for the work force for the 78,000 workers we have in the state of Pennsylvania.

Second -- and these are things that are obvious as on your nose, but nobody ever did them -- we have gotten significant dollars for weatherization, our own dollars and, of course, lately uptake in federal dollars and then with stimulus a huge uptake in federal dollars. But we never connected those weatherization dollars to our LIHEAP participants. People would apply for LIHEAP assistance, and we'd give it to them, and we'd have a weatherization program and never the twain should meet.

Well, somebody decided let's start weatherizing the people who are asking for LIHEAP, and guess what happened: Our LIHEAP requests went significantly down, and we saved significant money because we weatherized those houses. By weatherizing them, they didn't need to use as much fuel. Common sense stuff. I could keep you here for the next hour talking about other examples, but I won't.

Let me shift now to post-recession. Post-recession. In the midst of the recession every state has made budget cuts. In Pennsylvania, we've cut $3-1/2 billion out of our budget in the last 2 years. The new governor is going to have to make further budget cuts. But I believe by making those budget cuts in the right way, by increased revenue, and that's happening all over. Governor Christie and his State of the State Address yesterday said the same thing is happening in Pennsylvania return of revenue growth. We had last month, our revenue came at $175 million above estimate.

We're thinking that we may have 4 percent revenue growth in the next fiscal year beginning July 1st to June 30th. With that increased revenue, with increased savings, with making these cuts, continuing to find new ways to do it -- and there are always new ways to do it -- you borrow from everybody in the world. If another state's doing something that would save money in another ADA program, I want to know about it. By doing that I think we can get through this crisis.

Pennsylvania loses $2.6 billion in stimulus; it loses about another billion dollars in increase in mandated costs -- that's Medicaid corrections -- and almost $500 million a year in increased pension costs for our teachers and our state workers. So those are our two big drivers.

If -- with renewed growth, with judicial savings, we'll be able to get through I think the next year or maybe the next two.

The type of spending that I did even in the teeth of the recession, I increased education funding significantly. I think we were the only state in the Union to do that, but we needed to do that, and we have made great progress in education. That's probably going to grind to a halt or be put on hold for the next tow years as we lose the federal money.

But we can get through this if we put increased spending on a hold, and, hopefully, when two years pass, if the economy is robust enough and growth continues, we can get back to investing in things that we need to invest in.

The last thing, physical infrastructure. The way we've invested in it, in Pennsylvania, is I have pumped up the capital budget. Even in these difficult times states can use capital budgets to continue to invest in their physical infrastructure to make it better and to create significant jobs and significant contracts for both construction companies and manufacturing companies. I urge all new governors or existing governors to look at their capital budgets as a way to do it.

And, frankly -- last thought -- frankly, it is long overdue for the federal government to have a capital budget. There's no reason for us to pay for bridges, let's say, which has a 40-year lifespan the same way we pay for paperclips that have a 40-day lifespan.

MR. ANTHOLIS: Alice, you've been on commission after commission. I was surprised to hear that you found that to be an energizing, an energy additive experience rather than one that sucked energy out of you. Tell us about that. What is making you think that this might actually be a fixable mess?

MS. RIVLIN: If it's not a fixable mess, we're in deep trouble. We have to fix it. And unlike the governor's experience, which is optimistic in the sense that he is saying maybe the economy has turned the corner and our revenues will start up and things will get better, the states are in trouble because of the recession and the deep financial crisis that precipitated it.

That is, unfortunately, not true of the federal government. The crisis facing the federal government, and it is a serious threat, is not the crisis of a recession, although the recession and the things that we had to do, like aiding the state of Pennsylvania to get out of it, increased the debt. But the problem that the United States Government at the federal level is facing is that we are on a track that is unsustainable, not because of the recession but because of things we have done policy-wise over a great many years combined with the fact that we have an aging population and a very rapidly rising cost of medical care, and taste for good medical care. We want it. We all want it, and older people consume more of it.

So this is a story that everybody's familiar with because it's been true for a long time. But as you project the federal budget, even as the economy recovers, what you see is federal spending will grow faster than the economy can grow and revenues won't. Revenues will grow at any set of tax rates about as fast as the economy grows, but the three big entitlement programs driving federal spending over the next few years --- Medicare, Medicaid, and to a much lesser extent Social Security -- will rise faster than our revenues will, and that just opens an increasing wedge that we have to borrow.

This has been true for a long time. We knew this was coming, but it's hitting us at a very bad time. It's hitting us at a time when our debt level has risen. A few years ago you might have said, ah, you know, a really serious problem about the aging population and the baby boomers and the rising cost of medical care, but we have time to fix that because we're not in an especially high debt country. We have debt of about 40 percent of our GDP 3 years ago. Well, that's not true anymore. Now it's more than 60, and on the projections even with significant recovery it goes to 80 percent, 100 percent. That's serious stuff.

And the real question is what Bill posed: Can we get back on a sustainable fiscal track which will take reducing spending and increasing revenues? Can't we get back on a sustainable fiscal track and still invest in our future?

Now, basically, I'm only optimistic because we have to get back on a sustainable track. Whether we can do it without killing our future investments is going to be really, really hard. And that's what these sessions have been about, because everybody who hasn't quite caught up with the realities will say, well, yeah, right, we got to fix the fiscal thing, but we can't hurt the most vulnerable we can't hurt national defense; we certainly don't want to hurt research or innovation or infrastructure. But, you know, that's most of it.

MR. ANTHOLIS: So from a math standpoint, how do you do it? Give us a sense of -- the two commissions had a lot of overlap. There were some differences, but where are the biggest savings? Where do the biggest savings have to come from?

MS. RIVLIN: You do everything you can possibly think of. And that means first reforming the tax system so we can raise more revenues with a simpler and more pro-growth tax system. This is an enormous opportunity to do that, and we may also need a broad-based consumption tax which states will not be happy about because they tax consumption, right? But that's certainly a possibility.

We need to reform Medicare, and we need to reform Social Security, although that gets a lot more attention than it really deserves. It's a small part of the problem, and we've got to make the other parts of the government, defense and discretionary domestic spending, a lot more efficient and find new ways of financing the infrastructure that we need. That's not going to come out of the usual sources. We have got to finance infrastructure in a much more intelligent way, which I think means load use fees instead of a gas tax, congestion fees to reduce congestion, and a lot more tolling.

MR. ANTHOLIS: So Senator Bayh, you've been a well-spoken critic on the inability of Washington and particularly the other end of Pennsylvania Avenue to get things like this done. So on both the politics and the substance -- on the politics, even though we're facing this cliff, can we apply the brakes in time before we go off of it? But on the substance side, Republicans say we don't have a revenue problem, we have a spending problem. Are there Democrats that are willing to make hard choices, particularly on things like health care costs, essentially reforming health care yet again, in order to hit the brakes before we go off the cliff?

SENATOR BAYH: Well, the answer to that, Bill, is yes, but it will not be easy at all. And first let me start by thanking you and everybody at Brookings for hosting this. From my time in government -- and I miss being governor because every year, as you know, we had to give State of the State Addresses, so it forced me to take a couple weeks and take the longer-term view. Congress, that doesn't happen that often. But there's no question that the finding or comparative advantage economically, and innovation is going to be key to that, drives everything else.

We've in the last week or so seen an extraordinary situation where the Secretary of Defense is proposing reforms in the Pentagon because of his view that we are entering an age of fiscal austerity from a budget standpoint. So this dialogue we're having here today literally touches upon every facet of the government and American life, and how we resolve it is going to define our country for the next generation at least, perhaps longer.

So to get to your question, I'm an optimist by nature, but my experience on the Hill for 12 years has perhaps taught me to be a little more skeptical about the ease of which these things can be addressed, particularly because of the political dynamic.

My own guess is that the following will happen: that there are going to -- it will take exogenous events -- the debt ceiling limit we're going to bump up against. That's something that can't be avoided. Just like the expiration of the tax cuts on December 31st couldn't be avoided. That forced the Congress to act. We can't allow the country to default. My guess is we'll bump up right against that. You may see a couple of temporary extensions. But ultimately it will get done. But the price for that getting done will be some real fiscal reform, perhaps including broad-based tax reform, somewhat along the lines that Alice was mentioning. Spending -- the Democrats will have to be willing to say we'll agree to some spending caps going forward. The Republicans perhaps will have to agree to a reform of the Tax Code that will award investment savings, make it more efficient, get the corporate rate down to make it more globally competitive but at the same time will generate more revenue for the government.

So, there are agreements and compromises there to be made, but the overall political environment right now -- and through my father I've been around, you know, through the process for a long time. I've never -- with the exception of the 1960s during the time of the Vietnam War, some racial tensions, those sorts of things, I can't recall the political environment being as polarized and as difficult as it is today. So, that will make progress more difficult. But exogenous events will force progress. There will be episodically occasions when enlightened self-interest on the part of both parties will lead them to strike compromises.

For example, in my legislature when I was governor, the Democrats controlled a few years, the Republicans controlled a few years, it was split a few years. People who are in power -- the Democrats controlled the White House and the Senate, the Republicans can now control the House -- are held accountable. And so it's not -- you just can't, you know, howl at the moon; you can't just make, you know, prognostications without some grounding and substance. So, I think that pretty quickly both sides will see there's an election coming up. Even though they disagree on most things, it's going to be in their enlightened self-interest to get a few things done.

With regard to the topic of innovation, I would say Don't Ask, Don't Tell is coming up for renewal. There is some prospect there for some progress on education reform.

GOVERNOR RENDELL: No Child Left Behind.

MR. ANTHOLIS: No Child Left Behind.

SENATOR BAYH: I'm sorry, No Child Left Behind. What did I say?

SPEAKERS: Don't Ask, Don't Tell.

SENATOR BAYH: No Child Left Behind. I was going to say on the area of immigration reform, we're not going to have the DREAM Act or something -- broad-based immigration reform -- but perhaps something on ensuring that the brightest inventors and entrepreneurs can come to our country and remain in our country. You could see some progress on that.

Green energy. I think there's a --

GOVERNOR RENDELL: Huge effort.

SENATOR BAYH: The Republicans will want us to be more energy-independent, less dependent on imports of oil. Democrats will like the implications for CO_2. So, there's some progress there to be made.

Protecting intellectual property, which at the end of the day if you -- you can innovate all you want to. If other people steal your ideas, it doesn't benefit you economically quite so much. So, perhaps a more rigorous regime of intellectual property protection.

There are some things when the sides can come together even if the overarching narrative is one that's pretty disagreeable.

That answer your question?

MR. ANTHOLIS: It does, and on two -- for those who weren't here earlier, we have two policy briefs that we've just released today on two of those issues actually: on reforming immigration for high-skilled workers and also on having to do with intellectual property vis-à-vis China.

SENATOR BAYH: One other thing in the context of the tax reform, which I really do hope we can grapple with as we're dealing with the debt ceiling: making permanent the R&D tax credit is kind of a no-brainer.

GOVERNOR RENDELL: Absolutely.

SENATOR BAYH: I'd be a part of that. I mean --

SPEAKER: Crucial.

SENATOR BAYH: Yeah, I mean, those of us up on the Hill or used to be up on the Hill, we liked it having to be renewed, because it made people come to us and ask it to be renewed. But as a matter of policy, it ought to be made permanent, and I would hope that that could get done in the course of that debate.

MR. ANTHOLIS: So, Ron, you've spoken about the bipartisan failure to address the debt issue, and you've also lived on Capitol Hill through times when Democrats and Republicans with a lot of fighting both within the parties and between them figured out a way to work together. Is it possible this time around? It's an intensely polarized environment. On the Senate, I think the most liberal Republican -- and there are two from Maine, Senator Snow and Senator Collins -- are to the right of the most conservative Democrat, Ben Nelson in the House. It's not that much different. And that's a real sea change. Things are a lot more polarized structurally on the Hill than they were. And then within the Republican Caucus on one of the issues that Senator Bayh talked about as an action-forcing event -- the coming up of the debt ceiling -- there doesn't appear yet to be consensus within the Republican Party on how to deal with that. How do you see it on the Hill, and particularly on the Republican side? Will -- is there a coalition for common ground?

MR. HASKINS: Let me begin with a little personal story that the other members of the panel might enjoy.

Last night I went home and had all my books and I put them down on the kitchen table and it just happened that the agenda for this panel was on the top. My wife came in a few minutes later and she looked at it, and she said, wow you know, a governor and a senator, the great Alice Rivlin, a great business executive. Who the hell is this guy Haskins? (Laughter) So, the other panelists, I want to thank you for enhancing my reputation. My wife, I'll tell you, would appreciate that.

I think I'm like Senator Bayh. I hadn't heard him say that before, that I'm inherently an optimist, and I've seen a lot of amazing pieces of legislation go through the House and the Senate and pass that people said would not pass: welfare reform, many others. But I think 15 years on the Hill when a couple of years in the White House have convinced me that we're a long ways from any serious solution to our problem, and it's questionable whether we'll get there before we have a really serious outside event. So, I'm not optimistic. But if you do a kind of mathematical thing here and figure out what are the factors that tend to push toward some kind of an agreement among Republicans and factors that are -- would oppose it, I think the first thing, there have been some really hopeful signs. Alice emphasized this.

By the way, Alice's office is mine. I try to go by there as often as I can, because she's really optimistic, and it makes me feel better, even though I don't agree with her. (Laughter)

So, Republicans are serious about cutting appropriations. The government might not like this, but I'll bet they do it. I'll bet you that they get the 50 or 60 billion. I don't think they'll get to a hundred. But if you look at appropriations, they put defense off and things that we know they're not going to cut, like the FBI, and these are some really serious deep cuts. Some programs are going to get 20, 30 percent cuts. And I think they'll do it. They're really on -- and they probably won't become law, because I don't think the Senate will go along. But that will be an interesting dynamic if the House passes and sends them over there.

Second thing is that I think it's just completely shocking -- there's not a single person in this room that could predict anything like this were to happen -- and that is that Crapo and Coburn signed on to tax increases. That is enormous, and especially for someone who hangs out with Republicans. That antipathy toward increased taxes is shocking. It passes any human understanding that Republicans are so, you know, opposed to taxation. So, the fact that Coburn -- there are not very many who are more conservative than Coburn -- would sign on to something that involved tax increases I think is a big deal.

Third, I think Ryan is a key here. Boehner is a key, too, but I think Ryan really understands this stuff. He's spoken here at Brookings. All of this is -- I've read his material. Most people don't really like his solutions, but they're real solutions. And he's a real leader, and I think he will force the House and force the House leadership if necessary to do something serious.

And then the most important thing potentially is the philosophy of the Republican Party. I mean, this situation is made for Republicans to do what they want to do, which is reduce the size of government. Now, they love to vote for increased spending so they can be elected. But intellectually, Republicans talk ad nauseam about a smaller government, and what better situation to actually do it than the one that we're in now?

But there are some indications on the other side, too. I think one of the most important is a rule that was just passed in the House the Republicans have favored all along. I think they had a mathematical genius who figured this out, and what they figured out was if you increase spending by a trillion dollars, that really is a trillion dollars that will increase the deficit by a trillion dollars. But if you cut taxes by a trillion dollars, that's not really a trillion dollars. So, the tax cuts are exempted from the budget rules, which is just bizarre. And the thing that really bothers me about it that is one of the most effective budget process mechanisms that Congress ever invented. It actually did have some effect. And now it's been more or less ruined.

The final thing is, I think, really important notwithstanding the fact that I think Ryan is a great leader. The leadership on both the House and Senate side I think are really untested in something this dramatic that will really take very, very serious compromise and giving in on both sides, and especially now with the new Republican membership in the House. I was in the House when there was a staff on the Ways and Means Committee when there were 75 freshmen in the House and they were all wired, and they were going to change Washington and, by golly, Washington was never going to change them. Compromise, no, we're not going to compromise. It's defeat. Compromise is defeat and so forth. And there are a lot of freshmen that feel that way in the House. And the only solution known to man or God is great leadership.\

Now, no matter what you think about Newt, Newt was God in 1995 and 1996, and Newt really, really ran herd over Republicans in the House. I can remember -- you may remember Republicans shut down the government. Clinton was absolutely cleaning Republicans' clock. And Gingrich went back for about the 400th time to get a deal. He got a deal. He brought it back to the House, a big session with all the House members there. A very dramatic session. Newt gave, I would say, a 20-

minute talk about, you know, what was in the deal. It was a brilliant talk, and when he got through he looked at them and said, and this is the best we can do. It may not be the best deal, but this is the best deal we're going to get, and if you don't take it, you can find yourself another Speaker. And they took it. Which I think -- when people went in that room, very few people thought they were going to take it. So, that's what it takes. And maybe Boehner's going to take it out that way. Alice is very optimistic about Boehner. Maybe McConnell will turn out that way, I don't know. But it isn't clear now that the leadership that is needed will really be present. So, I am not optimist. (Laughter)

MR. ANTHOLIS: So, Ann, I'm the R&D Division of a company that's not sure whether or not it's going to actually have a product for you to sell, but the product that appears to be coming your way is not liked either by the engineers or the assembly line. But everybody's saying we have to get it out there. Otherwise, the company fails. How do you sell that to consumers?

MS. FUDGE: I think one of the things that -- let me -- first of all, I want to make a comment to what Ron said about Senator Coburn, and I'm going to use that as sort of the platform for my other comments.

Your comment was you were surprised that he supported tax increases. If I made another statement that would be equivalent to that it would be that he supported the recommendation of the Fiscal Commission, which meant that we would deal with spending and we would deal with taxes, which comes off in a very different manner in terms of the interpretation of the statements. And I think when you look at in the context of what actually for several senators, whether it was Durbin and the fact that Social Security was affected by the recommendations or taxes, back to your simple mathematics, the truth of the matter is we had to deal with both sides of the equation to begin to tackle the problem.

I say that to say this. In communications to consumers it's about what we say and how we say it. The facts are the facts, but what is highlighted and what is perhaps diminished impacts a person's perception of the issue.

During the course of the eight months or so in serving on the Fiscal Commission, one of the things that I was most concerned about was had we done a good job of helping people understand the depth of the problem. And so there were many efforts that were undertaken to do that, whether for those of you who may have seen the *New York Times* article when it -- they had a whole page on here's how you can solve the debt; the debt's a problem and, you know, here's -- here are the levers that you could push. That was a way to help people try to understand the complexity of the problem.

Believe it or not, there was an app that was put together so that young people could look at how we tackle the problem, understanding both sides of the equation. The interesting thing about communications today versus 20 years ago or communications of the 21st century is that there are -- there's no one mass market communication platform anymore. There are multiple and there are multiple consumer segments, which means that as we try to communicate the urgency of today's problem and what the potential solutions are, then we have to come in at a very micro level. Coming up with one big, you know, macro message is not going to work. And I think one of the things that you see -- I have to smile -- I don't know if a lot of you know that Pete Peterson started his career in the advertising business, but one of the things that his organization has done is come out with these ads, and you can decide whether you like them or not. But they are trying to increase awareness of the problem. It's the huge debt ads that talks about, in a very interesting way, the problems that we're dealing with. That's one factor, and that's one way to go about an en masse level.

On another level, there are several groups out there now who in their own way are trying to get groups of people together to talk about the problem and to talk about possible solutions. This is a very challenging problem. One of the things that I think Governor Rendell spoke to in his opening comments was what they have done in Pennsylvania in terms of addressing both the cuts as well as the investment. If there was a phrase that I would use in terms of helping people understand what we need to do, it's the "cut-and-invest" phrase, which we tried to incorporate many times during the course of our commentary in the report. We're in a world where, like business has been doing for the past 20 years, there's not enough money to do everything we want to do. So, through productivity and really conscious look at what can we afford and what do we have to cut, that's been the approach that's kept business, you know, at a point of trying to thrive through some very challenging times and not having sufficient money to invest. But it is that balance of cutting and investing, so if there were a phrase that as a marketer I would like to begin to inculcate more in the conversation, it's that we need to cut and we need to invest. There's no one or the other. It is not either/or. We have to do both. And I think part of the story will be what individual states have been able to do and how we raise the profile of what state actions have done to keep states afloat and how then we might be able to use that on a broader national level.

MR. ANTHOLIS: In Greece, cut-and-invest leads to riots in the streets. How does it play in Germantown?

GOVERNOR RENDELL: It's worked, I think, fairly well in Pennsylvania. Actually, I just left Building America's Future, the infrastructure organization that I chair with Governor Schwarzenegger and Mayor Bloomberg, and someone suggested we stop using the word "infrastructure," which people glaze over, and start using the word "future structure," which may or may not be good.

But I want to just comment on what Ann said about invest. We've got to change the dynamic. We've got to convince the American people there's good spending and it's investing in things that are important like our intellectual infrastructure, our physical infrastructure, our growth, and bad spending; and we've got to discern the difference between the two and we've got to cut and eliminate and get rid of the bad spending, but we can't do it at the cost of stop investing.

I was on George Stephanopoulos' show in January of last year, and they played that tape of Mike Pence talking to the CCAP Convention, and he was pounding the table saying we're the party of no. We say no to spending, no to borrowing, and no to taxation, et cetera. And then they came back to me and said what do you think? And I said it's a recipe for disaster. If we stop investing, there isn't a business in this country that's grown successful that didn't invest in its own future, and if we do that we're cooked. So, FOX, being interested in blood sport, invited Congressman Pence and I onto the same show, and he gave the same riff. He went first, gave the same riff. Then it was my turn, and I said Congressman, you seem like a reasonable man to me -- and truth be told, he didn't (Laughter), but I've learned on TV you want to be the nice guy. So, I said you seem like a reasonable man to me. Tell our viewers how we're going to keep our roads, our bridges, our dams, our levees, our ports, our water systems -- how we're going to keep them safe and working effectively and efficiently so we can compete economically and we can have a sense of safe wellbeing about it? How are we going to do that if we don't invest in their upkeep?

And he really was silent for about 10 or 15 seconds, and I think the question had never been phrased that way to him. And finally he said -- the best thing he came up with is there you Democrats go again, using the word “invest” when you really mean “spend.” That was the sum of his answer.

So, we do have to find a way to get that message across, maybe not inside the Beltway, but we’ve got to find a way to get that message across outside the Beltway in hometowns. You can’t stop investing. No business does it. If we stop investing, we are fast on our way to being a second-class economic power. No question. No ifs, ands, and buts about it. The American infrastructure, in case you haven’t noticed, is crumbling. It’s crumbling right before our eyes, and no one seems to have the will to do much about it.

MR. ANTHOLIS: Sticking on the infrastructure point, Alice, Senator Bayh, Ron, other than the Transportation Bill, how much appetite and how much budget bandwidth is there for investment, or are there ways to structure, like what the governor was suggesting before about a capital budget for the federal government? We heard Jeff Immelt, for instance, earlier today being not particularly optimistic about an infrastructure bank. Where could this lead or where won’t it lead?

MR. HASKINS: Well, first, Ed, you may be pleased to know that the congressman may be about to receive enlightenment because he’s thinking about running for governor of my state. So, he may have a different view of some of these topics the next time you’re on a panel with him once he's had to confront reality. But he may have a different take on federal aid to states, too.

It is true that, as the governor was saying, not all spending is created equal. Some spending has a more profound effect on productivity, efficiency, job creation, those sorts of things, and we should probably prioritize that in a constrained fiscal environment, so we're going to set priorities. I would just emphasize that we need to differentiate between the short-term and the long-term. We may not be able to sustain the levels in the short-term that we desire. We may need to prioritize first tightening the belt and getting the house in order, but then quickly pivot once we've accomplished that to prioritize investments in those things that really do pursue our comparative advantage, lead to innovation in both physical and intellectual capital. That's the way I'd look at it. So we may be in for a period of two or three years.

GOVERNOR RENDELL: Evan, may I ask a question? When I became mayor of Philadelphia, we faced the biggest deficit in terms of percentage of revenue than any American city ever did. I cut everything and people were furious and everywhere I went I was picketed and whatever. But I managed to use the capital budget to invest in our growth and create some jobs and economic vitality. Why is there such a resistance? I've never been able to figure this out. Why is there such a resistance in Washington to establish a capital budget? Every other political subdivision has it. Most businesses do it. Why is there an aversion to it?

SENATOR BAYH: I've never been an appropriator, Ed, so that probably gets into the particular dynamics of the appropriations committees and who gets credit for the projects and things like that. But on a theoretical scale you're absolutely right that it ought to be done from a management standpoint, but we're dealing with Congress here and how the Congress operates and that gets into the realm of psychology or some might suggest abnormal psychology.

MR. ANTHOLIS: Or parapsychology.

MS. RIVLIN: I think there actually are --

SENATOR BAYH: Economics and politics and you're talking about one and the Hill is the other.

MS. RIVLIN: The fear of budgeteers about establishing a capital budget is that it becomes simply an excuse for more borrowing. I think the key to financing infrastructure is we've got to charge for the use of the infrastructure in sensible ways. At your level, the state level, you actually do some of that or you do it at the local level. You do borrow for infrastructure, but something has to back those bonds, a dedicated revenue stream of some sort. At the federal level we have not been used to doing that so that the budgeteers have thought there they go again, those infrastructure folks. They just want to add to the federal debt and the federal debt is going up very fast already and we can't add to that. So it's got to be a different kind of thinking about how you finance infrastructure at the federal level.

The other thing is I think the reason there's been resistance is it's very hard to define what investment is in the federal budget because the federal government doesn't actually do a lot of infrastructure itself. It's grants, and if you think of long-lasting stuff as physical investment, most of it is military in the federal budget. So it is very different from looking at a state budget.

SENATOR BAYH: Can I just make one other point? I'm going to follow-up on something Ron said. It seems to me that we have the gamut of the spectrum here. We have the optimists, we have the pessimists and I'm the agnostic, so we have every point of view represented. But if Ron is correct and the debt ceiling vote is not really the precipitating event to at least begin to make a down payment on addressing the fiscal problem, then the next step along the road will be either a substantial depreciation of our currency not in an orderly way but in some sort of a precipitous way or a spike in interest rates. It will be some market reaction. The market will ultimately impose discipline in the political process. But at that point the imbalances have gotten to such a size that dealing with them will be even more painful and disruptive so that's why I'm hoping that cooler heads will prevail and we'll have this initial exogenous event serve as the trigger rather than waiting a few years down with something that's so much larger and more difficult to grapple with.

MS. RIVLIN: Exactly.

MR. HASKINS: I want to just expand on that for one second. This distinction between investment and other spending is one I think that everybody appreciates and I'm not surprised that your story about Pence turned out the way it did because everybody think investment is a good thing especially investment in human capital which the federal government do a lot of. This is a great reason why we have to deal with the deficit now, because if we deal with it in an emergency in any of the events that you just described, it's going to be like Gramm-Rudman-Hollings for those of you who remember. We're going to have across-the-board cuts, we're not going to be careful about the cuts and nobody is going to have time to think about if we do this, this will happen. We need reasoned debate about this. We need so start now and have an orderly, reasoned debate where the ones with the most votes win and that there is some room for bipartisan compromise. So to me your point about investment is really the point about why we need to get started and do this now and not wait.

MS. FUDGE: Ron, just to add to that point, it was a point that we made consistently in the deficit commission about now because the longer we delay an action the more difficult the decisions become. So one of the reasons that we put forth some very specific opportunities to make cuts in some very specific sort of frameworks within which to look at tax reform, simplification, et cetera, trying to deal with the corporate side so that we don’t fall further behind competitively, I think we have a template. The question is will our Congress use the template as a way to have serious discussion so that we can have actions before, you’re right, we get into a situation that not very wise decision are made.

MR. ANTHOLIS: Why don’t you go, Alice? And then I’m going to turn to the audience and start fielding some questions because we’re going to lose Governor Rendell in about 15 minutes?

MS. RIVLIN: I wanted to build on this conversation and what the senator said because the definition of an optimist is not somebody who thinks we’re all going to sit down around a table and agree on things. It’s not going to be like that. The definition of an optimist is someone who thinks much of the political system will get it in time, will understand that we can’t let this catastrophe happen so we have to act. And they may not all way to act in the same way, but it’ll precipitate a negotiation. That’s the definition of an optimist.

SENATOR BAYH: As Ben Franklin once said, “We must hang together or we shall be hung separately,” so we’re kind of in that situation here. One last tidbit and let’s get to the questions. With regard to the debt ceiling vote, I wouldn’t be a bit surprised, I hope it won’t come to this, but you may see a scenario where we’re going to tiptoe right now, nobody in the House is going to vote for this: the Republicans because they ran on a platform of fiscal austerity and getting the deficit under control, the Democrats because they’re now in the minority and they’re going to say you guys wanted the majority, you wanted to make these tough decisions, so go for it. We're not going to vote to raise the debt ceiling. You'll just beat us over the head with it. So it's going to be very hard. And it won't be easy in the Senate, but it will be much harder in the House.

And I wouldn't be a bit surprised if we didn't see a repetition of what played out around the time of the initial TARP vote. If you'll recall, the markets were all on pins and needles. It was really a very precarious situation. Nobody wanted to vote for that in the House either. The first vote, it went down, failed, and the markets then dropped precipitously, and within 48 hours people concluded we can't have that. It took the market. It took outside events to force the political process to do ultimately what needed to be done so that you might see a repetition of something like that.

MR. ANTHOLIS: I want to turn to questions from the audience. Before doing so I'm tempted to point to the 800-pound gorilla in the room, which is the weight of health care costs on the budget moving forward. But if there's not optimism about raising the debt ceiling, which is relatively easy, then I can't imagine that there's optimism about that. Why don't we go to Darrell and then I'll field a few more questions?

SPEAKER: This is a question for Senator Bayh, although anyone else who wants to comment on this is free to do so. It seems like Congress has just become so dysfunctional in terms of inability to address problems, extreme polarization, and hyperpartisanship. In the Senate there are all these rules changes that interfere with the institution's ability to get things done. Having served on the inside of that institution, if there were changes that you could make to improve the performance of that institution, what would those changes be?

SENATOR BAYH: That's a longer conversation. There is a robust debate going on within the Democratic Caucus and this will come to the fore here pretty quickly about whether to change the rules on the filibuster and if so how to do that. My best guess, right, and there's this whole debate about whether under the Constitution the Senate can write its own rules on the first by a simple majority vote. I don't know whether that's going to be put to the test or not. My best guess is that there may be something negotiated informally between the leaders that will lead to a reform of the filibuster, but still requiring the 60-threshold vote requiring more members to actually be on the floor physically to filibuster and a number of those kinds of things, so I think that's one thing that just gums up the works. We didn't even bring things up. The mere suggestion that it might be filibustered keeps things from even being brought up, so that's certainly one of the things.

I think we need to find a way to get some of the younger members more actively involved. It's interesting in that the Democrats and the Republicans operate differently in the Senate. The Republicans rotate the chairmanships I think every six years; the Democrats don't, just in perpetuity. And we have such large freshman and sophomore classes that he is working to try and get them involved a little bit more and they tend to have a little bit more of a reform instinct about them and that would be a good thing.

Another thing is anonymous holds. You can stop Executive Branch appointments and nobody even knows who's doing it, so at least having to announce who you are and articulate why you're doing what it is, that seems to be a fairly sensible step to take. So I would look for some modest changes perhaps not within a formal vote because that would cause all hell to break loose on the filibuster, probably the reform of the anonymous hold, some of those kinds of things.

And Senator Begich has been appointed as the representative of the freshman class or the sophomore class now to the Leadership Committee, and look for Mark Warner. He's somebody who's really stepped up and is taking a leadership role. Joe Manchin, he is, as I was saying in my remarks beforehand, is going through the difficult transition of having been the chief executive and now being 1 of 100 and having an office in the basement of some building.

I'll share with you one story and we've got to get on. Here I've been governor and I had a big ornate office. My Chamber of Commerce comes to see me my first week in the Senate and I had a temporary office in the basement of the Dirksen Building, and the trash receptacles you had to go past to get to where my little cubbyhole was.

The head of the Chamber looked at me. They were all kind of hesitant and didn't want to say anything. He finally looks at me and said, "Evan, who did you piss off?" Joe may be one of those guys. He's still got that governor in him and wants to stir the pot a little bit and he might be another one to look at.

MR. ANTHOLIS: I want to direct a little bit of this question to Governor Rendell. On the one hand, you've got your own set of issues with your state legislature on how to get things done. When the political class or the broader people who you talk to in Pennsylvania look at what goes on in Washington, particularly in the Senate, is it discussed or is it just off the radar screen and they're not really paying attention to it?

GOVERNOR RENDELL: Half don't pay attention it and half just shake their heads in bewilderment. I think, Evan, and correct me if I'm wrong, that when we had the 59 votes of senators, 41 senators representing 18 percent of the American population could stop something from happening in the United States Government. Absolutely ridiculous, just ridiculous, infuriating. I actually called David Bois and I wanted to as soon as I left office be the plaintiff in a taxpayer suit to say that the filibuster rule was unconstitutional because I believe -- I have no legal basis for it, I just know it has to be unconstitutional.

SENATOR BAYH: David will find one.

MR. ANTHOLIS: The gentleman in the blue sweater. Wait for the microphone. And tell us who you are, please.

MR. DZOMBECK: Dan Dzombeck, the Motley Fool. I'm also a Pittsburgher for Governor Rendell.

Alice, you had said we need new ways to finance infrastructure. What role do you see selling infrastructure to investors playing? And Governor Rendell, could you talk a little bit about the challenges to placing tolls on roads to invest in new infrastructure?

MS. RIVLIN: It depends what kind of infrastructure you're talking about and I'm not a big fan of selling a whole lot of things to investors unless it's a really appropriate place. But what I have in mind is shifting our highway financing, for example, to road use pricing. And the gas tax is a diminishing source because of more fuel-efficient vehicles and it doesn't charge you for the use of the road or for driving on a congested road, so it doesn't have the right incentives.

GOVERNOR RENDELL: I would say the first thing the federal government has to do in reauthorization of the Transportation Act is lift the ban on states tolling federally accredited highways. It's insane. The theory is we don't want our taxpayers to pay twice. That's like saying you pay money to buy a car, but then you're not going to pay money to maintain your car. Ludicrous. Nobody would do that. Right now the law is other than the states that have been grandfathered, we can't toll a federal highway where federal money was a portion of the construction cost; not even the majority but a portion, we can't toll it.

There are supposedly three pilot programs and none of them have gotten off the ground. It's insane. I-80, which I wanted to toll and the federal government turned us down, I think we lost on the altar of health care, but nonetheless I wanted to toll I-80. I-80 goes across the length and breadth of Pennsylvania up in the mountains. It's impossible to maintain. We spend $80 million a year just maintaining it in C to C+ condition. We wanted to toll it and spend $200 million a year maintaining it and use the extra money to help us with other highway stuff, and we were turned down. It doesn't make a bloody bit of sense. And if we're not going to get the money to do transportation infrastructure from D.C., and it doesn't look like we are, and we're certainly not going to get anything that closely resembles the Oberstar proposal, then they've got to let that happen, number one.

Number two, we've got to get the private sector involved in infrastructure in this country in every way. In every way. If we're not going to be willing to step up and fund for ourselves, we've got to do it. The private sector, I am told by Felix Rohatyn that there is at least $130 billion right now ready to go in American funds and in European funds that are ready to be invested in American infrastructure right now where there is a reasonable return on investment, and we ought to be doing it. We ought to legalize it in states where there are barriers. There ought not to be any federal impediments to it. I don't think we sell. I think we lease. The difference is if we lease as a term of the contract we can control when tolls go up, we can control the maintenance schedule, and we can control certain things. We have to do it. We have no choice.

MR. ANTHOLIS: What is the public appetite for that? Do you think the public will be willing to do it if they think the services are --

GOVERNOR RENDELL: If the public realizes that there's no other alternative then I think they'd be willing to do it. When we were talking about leasing the turnpike there was a big outcry, you're going to turn it over to foreign investors and the leading bidder at that time was McCrery. And I said, yes, we really have to worry about our Australian terrorists. Then a Spanish company was the winning most successful bidder and I said to the public if you don't want them, nobody flies into Disney World anymore because they operate the airport in Orlando.

SPEAKER: Governor, I just wanted to follow-up. My name is Bob. I just wanted to follow-up with your comment to ask the senator about the experience in Indiana because I understand that in Indiana you've actually sold these highways. To comment more broadly, the whole concept of public-private partnerships where we outsource utility kinds of operations like utilities, electricity generation and railroads, that's an American invention. We invented it and we forgot all about it after the Second World War. The rest of the world has embraced it. I think we really need to do that starting I think with a federal infrastructure bank that can eventually be privatized, so I'm curious as to your perspective.

SENATOR BAYH: The Indiana Toll Road which runs across the northern part of our state was sold to a group of international investors and it helped to fund projects all across the state. It proved to be somewhat politically controversial along the corridor because they felt they were paying the tolls but not all the money was being reinvested in their area, that it going some other places, but we've had a couple of elections since then so that it's in place and going forward.

In thinking about all these things, one of the most interesting pieces of data I've seen in the last several years was from a presentation put on by the Democratic Senate Campaign Committee several years ago. ABC had taken a big poll with 3,000 samples. One of the questions they asked on this poll was out of every dollar that you pay in taxes, how many cents do you believe are wasted? Some people said 100 and some people said 0, but the average of the American was 42 cents on the dollar. That's not possible because a lot of this is just transfer payments and that sort of thing, payments to interest on the debt and all those sorts of things. But my point is from a political standpoint if that's what people believe, if you're asking them to give more money to an enterprise they believe is wasting 42 percent of it, you need to address that concern.

How does this relate to this discussion? When you're talking about use fees, things where people can tangibly see the results for what they're paying, you're a lot more likely to get public support for that than if you just kind of dump it into the overall general budget and say trust us, this will benefit you. That's one of the reasons that these kinds of ways of raising revenue traditionally are viewed more favorably because can see the results and they believe the money is being used for the purposes they expect rather than being wasted.

GOVERNOR RENDELL: Unfortunately, I have to go. I got the time schedule wrong on this, but I wanted to just follow up on what Evan said. He's absolutely right, it's where, I think, those of us who believe that government spending can and -- can be a good thing and can be targeted to things that are important. If we're going to fight the battle, infrastructure is the best venue for the reason that Evan said, people can see it.

Even in the 2010 election where everyone who wanted to spend any money was bludgeoned to death, 61 percent of the transportation infrastructure ballot initiatives that required either increased borrowing or increased taxes passed and they passed by 64 percent of the vote because they were tied to a specific project. It wasn't give us money for infrastructure broadly; they were tied to a specific project. We're going to widen that bridge from two lanes and you sit for a half-hour each day in the morning and a half-hour at night; we're going to widen it to six lanes and it's going to cost X, and we want a toll or we want to borrow or we want to raise taxes. Sixty one percent, in the worst climate for spending probably in the recent history of the U.S.

So, I think we have to do this. We have to find a way to put our heads together to fund our infrastructure. And besides, it's the single best job creator: jobs on the construction site, jobs back in the factories.

The first year of stimulus funding for transportation in Pennsylvania -- first year -- $600 million -- we had 2 years, $600 million each -- orders for steel increased by 43 percent in the state, asphalt and concrete over 50 percent. Factories hired back workers in the deep of the recession.

And the last thing I want to say, Alice, we've got to change the way we score in Washington. If we went on a $3 trillion, 10-year infrastructure revitalization program, the additional jobs, the additional federal taxes, the additional corporate taxes we produced would be -- let's assume the debt service was $280 billion a year. We figured it out; the additional revenue to the Federal Treasury would be about 120- to $130 billion. So it's not $270 billion to the Federal Treasury, it's $150. But there's no offsets in the way you score down here in Washington, another thing that's nuts.

MR. ANTHOLIS: Ron, what's the -- as the governor is getting his mic off and exiting stage left, so to speak, what's the bandwidth on the right for this kind of thing, first investing in infrastructure but then in particular user fees, pay-as-you-go, all that? Does that make it easier to swallow or do they feel that that's the fox in sheep's clothing?

MR. HASKINS: I think if you call it privatization, there's a lot of support for it. Republicans like things that are private, you know, so I think that's a reasonable thing. And also, the governor didn't say this explicitly, or the senator, but there's a fair amount of evidence now that a lot of these public-private partnerships and leasing out highways and so forth have worked pretty well, and the voters have accepted it. So I think there are good arguments for it, good reason for it, and also, not to be lost is you don't have to raise taxes, and that's a huge deal.

So, I think there is -- this is an example of things that in a reasonable environment, you could reach some compromises.

MR. ANTHOLIS: Great. Next question. I want to go to somebody who hasn't -- gentleman in the green tie back here. Thank you. Thanks, Governor.

MR. GOW: Thank you very much. Roddy Gow, I run Asia House in London. My question has nothing to do with Asia although that's the other 800-pound gorilla in the room. And it's very interesting as a Brit to hear about public-private partnerships because I can assure you, they do work and work extremely well.

I wanted to ask a more fundamental question of the panel because in the previous panels we've talked about preparedness to stand, you know, the argument on its head and really consider what should be done to enable different sectors to function more effectively. In my country we've seen in an almost unprecedented way, facing a terrible economic crisis, the formation of a coalition government. People who we never thought would come together being forced to come together. I would like to ask the panel whether in their view the present political system here works or is working so poorly that the concept of perhaps a redesign along the lines of a coalition, maybe in the short, rather than the long term, but maybe in the long term, is feasible?

MR. HASKINS: I think it's a great question. You could have also mentioned Germany, Spain, The Netherlands, to some extent, France, all these countries who have taken bold and decisive action, all of them have had great leadership, and they are making progress. Some of them have made remarkable progress, The Netherlands especially because they started earlier.

And yet, the U.S. sits around throwing bombs at each other. We haven't -- I don't think we've done a single significant thing in the House and the Senate that they agreed to that -- we can agree to spend more money, we can agree to cut taxes, but to actually take decisive steps to solve this problem, I don't think we've done anything.

Now, the idea of changing our form of government, going to a parliamentary government or some such thing, it just scares me to death. I bet that scares you, too. Because you never know what you're going to come up with, so I don't think that's possible.

I think the real problem is the mindset of leaders in -- of political leaders in America today. There was a time when people realized, you know, we've got to get this done, we have to cooperate, we'll yell at each other out there on the floor, but we'll get the votes and we'll get it done. And there are all kinds of examples of that in the past. And that mindset of we're going to get a deal, I think, has really evaporated and there's a lot more name calling, a lot more, you know, challenging the other side in the most fundamental, philosophical way, and you don't cut deals. So, this is a real test. We'll see over the next couple years. Alice is optimistic, and there are indications that -- in the way you said, you know, I recognize that as optimism, but our political system has not been up to it so far, that's for sure.

MS. FUDGE: Let me add to that comment because I travel a lot and spend a lot of time in the UK for a variety of meetings, and it's been fascinating to watch the transition with your coalition government, and I've asked myself that very question, would something like that be possible here in the U.S. And I don't think so, to be quite blunt about it, but here's where I think the opportunity arises: When we as a country are met with a massive challenge, we rise to the occasion and we have -- but we have to -- the question I ask is, why do we have to wait for that moment of a massive challenge to be able to act?

We just had an incident here in the states a few days ago and just absolutely unthinkable, and so the question is, how much of this is a moment for us to now step back and think what do we need to do differently? And that's a lot of conversation going on around that. Government-wise, I don't think we're going to move to a coalition way of operating, but I do hope that we can maybe diminish the conversation around polarization and talk about how we can cooperate to solve the problems which honestly need to be addressed now because time is just not on our side.

MR. ANTHOLIS: The senator wanted to get in and then I wanted to follow up with the senator on a question on this point.

SENATOR BAYH: I'm reminded of something that a former prime minister of your nation once said about us. Of course, his mother was an American. He said, "The Americans can always be counted on to do the right thing once they've exhausted the alternatives." And so we may be close to that point.

We're not going to change our form of government to go to a parliamentary system, but we may reform the current structure that we have. I mentioned some things in the United States Senate, we may change some of the -- our budgetary processes to find a constitutional way to give the Executive some line item veto authority as most governors have. That's a constitutional issue, but there are some ways to deal with that. Maybe other things in the long run put us on a better fiscal path in terms of changing the balance, but the one thing I would say is from time-to-time, we have a two-party system, that leads to more stability. We don't act as quickly, but, you know, there's something to be said for both. I would say, you know, Ron mentioned a couple of the other European nations. With the exception of Germany, I'm not sure I'd change fiscal situations with any of them. Now, your country is taking pretty aggressive steps to deal with your problem, but it is bigger than our problem. So, I don't think that really gets to an institutional superiority on the part of European parliamentary government as opposed to our form of government.

The point I wanted to make is that from time-to-time when dysfunction has gripped our form of government, it is not unknown for a third party, a third force to come along. The last time we went through this, I also remember Ross Perot, back in 1992, he garnered about a third of the vote running on getting the deficits down and dealing with our fiscal -- you know, getting our fiscal house in order and all that kind of thing.

The two major parties then tend to co-opt the message of the third part, so I'm not predicting that we're going to have a third party or that sort of thing, but I do think to the extent the two parties get discredited, you might see a third force arise which would attract support of the American people and then that would force one of the two major parties to take action.

MS. RIVLIN: I think our version of coalition government is called divided government and it works to get some things done. I mean, we had divided government from '95 through 2000, and we did balance the budget and get it into surplus and we did pass welfare reform and a few other things. That may happen again. That's part of the reason, I think, we're not in as bad a situation as we might be.

MR. ANTHOLIS: Since 1960, we've had a much more divided government than we've actually had one-party government, but that does raise a question, I think, that I wanted to direct back to Senator Bayh and maybe to Ron as well, which is there seems to be a very short window for it in this Congress, right, because we're going to have a presidential election in two years, which means we're going to start having a presidential election this spring, summer, or early fall. And at some point once -- on the Republican side -- the nomination process starts up, and at some point the game becomes anything that the President wants to do, the Republican candidates won't want to do, and will make it much more difficult for Republicans in Congress to support any sort of deal with the President. We saw this a little bit in the lame duck session where immediately once the deal was done Mitt Romney, one of the most moderate Republicans, potentially, in the race, immediately condemned it even though conservative Republicans in the deal embraced it.

So, tell us a little bit about that time sequencing in the next year of divided government. When does the window close? We've talked about the action forcing event of the debt ceiling, what does the gaming look like between now and Memorial Day or, at the latest, Labor Day?

SENATOR BAYH: Well, I think six months is about right, Bill, but you're going to have three different kinds of politics going on. One will be presidential politics and those who seek the Republican Party nomination are going to have to be going to places like Iowa, South Carolina, New Hampshire, and presenting themselves to the most ardent of the party faithful who tend to be more conservative, more ideologically intransigent than even the Republican electorate as a whole. And so the challenge for them is how do they appeal to that Tea Party-type element, but at the same time not alienate Independents and moderates. My guess is they'll lean more toward, you know, winning the nomination first and figuring out how to appeal to the center second. And so, for them, they'll be out there kind of opposing almost everything the President does.

In the Senate, we've got a number of closely -- it's now 53-47, and there are at least that many -- enough seats in play 2 years from now that it could -- the Senate will be in play. And so if you're Mitch McConnell and the minority, you're going to be looking at, okay, how do we position ourselves to try and maximize our chances of succeeding in the upcoming election, you know? And that's going to lead to a little more opposition than not. They're going to say, well, it worked pretty well the last couple years. You know, if we agree with the President only three things can happen: it works and he gets the credit, it doesn't work and we get the blame with him -- there just aren't -- it's not a real attractive way to go, so more opposition than not in the Senate, which, since we require 60 votes, that makes it difficult to move things through the Senate.

But the third thing I was going to mention is, and this is more on the optimistic side, you then have the politics of the House. Well, we have a new Republican majority and as Ron was pointing out, some of them are fairly ideologically fervent, and so forth, the freshman class. They're going to bump up against reality now and eventually the leadership -- and this is my read on John Boehner -- he's probably a pretty practical guy at the end of the day. They can't go to the electorate two years from now with nothing to show for their leadership. They're going to -- it's concentric circles, where the concentric circle of what the President wants and the concentric circle of what the House majority might support overlap. There's where you can get some things done and both sides will have an incentive to do it because the new House is not going to want to go to the people and say we did nothing but argue for two years. We argued a lot, but we actually got some things done.

MR. HASKINS: By the way, in '95 and '96, that is exactly what happened. Republicans said no to almost everything insisting, you know, they weren't going to compromise, as I said before, and then people sat around and said wait a minute, we haven't done a damn thing. We have this huge agenda, you know, Contract with America, and the Republicans started dealing with Democrats and passed a lot of legislation so that they could go to the electorate and say that they had made achievements which, indeed, they had.

SENATOR BAYH: One last point of view. Look at the polling following this election, it was more a referendum on the status quo in Washington, number one, and to a somewhat lesser extent, some things that our majority had done that were viewed unpopularly in the public. It was not an embrace of the Republican Party generically or a specific agenda put forward by the Republican Party, so if people are equally unhappy two years from now, they're just -- we're in a mode where they're constantly voting the rascals out. Well, if they have nothing to show for it, they'll be the new rascals. So they're going to have to have something to show for this, otherwise they're going to be the victims of the dissatisfaction.

MR. ANTHOLIS: I think we have time for one more question before the last panel. Let's go to the gentleman all the way in the back.

MR. FANUSÉ: Thank you very much. My name is Yaya Fanusé and I think I'll respond here because I retired from state government of California 2006. I'm forced to ask this question or make a comment because of Senator Bayh talking about the British. Trust me, the United States position is worse than the British. In the short run you don't see it, so I give you a metaphor from Africa.

When a rat is about to take its last breath, it shakes its tail. So I hope you guys will start thinking that United States is in a very precarious situation and you have to stop using cliché formulas of explaining government efficiency and effectiveness and come up with a really drastic way to solve your problem. Otherwise, you're going to become a third rate nation. I have been here since 1967, this is the best country to be, but you guys are making a mockery of it. Thank you.

MR. ANTHOLIS: I don't want to end without a question, so if we can get one last question before the session goes. (Laughter)

SENATOR BAYH: Sounds like the voice of the electorate from this last election right there.

SPEAKER: I just wanted to -- some of the comments Alice made about tax policy reform having sort of a more pro-investment, pro-savings, cutting the corporate taxes, and things like that. I see measures like that as key to providing the sort of policy certainty that is really going to stimulate the kinds of investment from the private sector in the future, which I think is really the key. And I think that goes beyond budget cuts and things like that --

MR. ANTHOLIS: Is there a question in this?

SPEAKER: Yeah. What's the political feasibility and timeline, I guess, in terms of doing something like that? In terms of having real tax policy reform along those lines?

MR. HASKINS: I was with Ways and Means Committee staff in '86 when we passed the -- well, most people think it's really a spectacular tax bill, it was right out of the economics textbook -- broaden the base, lower the rates. And there's always an appetite for that. Dave Camp has said that he could go for that. The Speaker said several times that he doesn't like all these tax expenditures which is -- that's essentially broadening the base when you close the loopholes.

I can tell you, though, that that's an example of a bill that there's just no way it could pass, and it did. I don't know how that happened, because the lobbyists were everywhere. I mean, everybody got an (inaudible) and the lobbyists were everywhere trying to kill the bill. And right up until the last minute, I think the smart money was the bill's going to die. Maybe you feel differently about that, but they passed it.

So, I think there is always an appetite for tax reform if it's defined as broadening the base and lowering the rates, but the complication this time is you've got to do it to raise more revenue. That's a tax increase, therefore, you get all the anti-tax fervor that you get from Republican interest groups.

So, I would not predict it will happen, but relative to some of the other things we've talked about, I think there's at least a chance.

MS. FUDGE: I think like all of these things it depends on whether there's a real sense of crisis that overrides the army of lobbyists who will be there to oppose everything and that's going to take a lot of leadership, as we've said.

SENATOR BAYH: The odds against anything passing in a divided Congress are almost, by definition, more than -- you know, less than 50-50, but I get back to the debt ceiling and the fiscal crisis that we face. There is a precipitating event here and the Republicans in the House, some Democrats in the Senate, leadership positions, some representing the President, have mentioned tax reform as something that they would like to see get done in that context, so I would put the odds of this as higher than normal because something has to get done on the debt ceiling. And if this is one of the things that can be done to kind of make people feel better about what has to be done, it won't just be all take your medicine. There will actually be a pro-growth component to this that some of the business community and elsewhere would find to be a positive thing.

MS. RIVLIN: I was going to say one other point about the business community. One other elements of tax reform that we've talked about in the context of the Fiscal Commission was what we could do to make the business community more competitive globally, and so some of the tax reform options have elements of it that contribute to that.

MR. ANTHOLIS: Well, with that, I want to thank the panelists, first and foremost, who were just terrific on this, and then also thank you, the audience for terrific questions, for staying with us for this day. We have two more panels left. The next panel is on manufacturing. We're going to go right into it. So, we really do request that people stay in their seats so that we can roll quickly into the next panel. (Applause)

(Break)

MR. BAILY: Okay. Let's get started. Thank you all for being here and thanks very much to the panel, which is a stellar panel.

I'm Martin Baily. I'm the director of the Business Initiative and a senior fellow here at Brookings. I also work part of my time with McKinsey, so as someone said McKinsey's fingerprints are all over this session.

One of the things I've done both as an academic and in work with McKinsey is to look at productivity and innovation and I think that's going to be a key point that we're going to talk about today. Other things that we've done at the Business Initiative just to plug that group is we've looked a lot at financial -- at the financial crisis and financial reform. We have a new project that we're billing, trying to understand how private capital, particularly annual investing. Private equity is providing the finance for productivity and innovation.

Well, we heard earlier today one of the things that I think is a key issue is that the U.S. is a very strong hub of innovation but a lot of the manufacturing is not done here in the U.S. Now, there's sort of a couple of perspectives on this. When I was in China I listened to a long harangue which was translated to me and basically said the U.S. is exploiting China because an iPod is made for $300 and China gets $4 out of that -- $3.83, actually is what the estimate was of what it takes to assemble an iPod. This was a 2005 iPod. And of course, Apple gets a whole lot more than $3.83 out of iPods and iPhones and all the rest of it. So I can see how they feel that they're being a little exploited, but of course the bad news for the U.S., is you don't do a lot of the other manufacturing here in the U.S. So we do get quite a lot of the income from these innovative products. We're not creating a lot of the manufacturing jobs here.

Let me now turn to the panel. And the first person on the panel is Dominic Barton, who is the managing director of McKinsey. He spent many years working in Korea and became the chairman -- McKinsey chairman in Asia. He and I had -- I had the privilege of working with Dominic in Korea in the mid '90s when we did a productivity study of Korea. He's currently based in London. I believe you're a Canadian citizen, so a citizen of the world and the managing director of McKinsey.

The next panelist is Klaus Kleinfeld, who is a very distinguished business leader. He's now chairman and CEO of Alcoa. He's held that position since 2007. Prior to that he worked with Seaman's for 20 years and was CEO of Seaman's from 2005 to 2007. He is not only a hugely successful business leader but also a very thoughtful statesman and spokesman on business issues.

And then our third panelist is Austan Goolsbee. He has, I think, one of the best jobs in the world, although I'm not sure it feels that way quite at the moment but hopefully by the next couple of years it will start to look a lot better. He's currently chairman of the President's Council of Economic Advisors. Austan is on leave from the University of Chicago. He was a leading economic advisor to President Obama in his campaign and was a member of CA prior to becoming chair. Less known perhaps to this audience is that Austan is also a skilled standup comedian, a skill that I'm sure stands him in very good stead in these troubled times. (Laughter) I'm not sure if he's going to practice that on us on today's occasion but I will testify he can be very funny as well.

Okay. Let me start with Dominic. And I think the question for you that we had talked about that we'd like you to address a little bit is about innovation. And McKinsey has done a lot of work, knows a lot of companies, has worked with a lot of companies on the issue of innovation. So maybe you would give a little bit of your perspective on that -- on that issue.

MR. BARTON: Sure. Thank you, Martin.

What I thought I might do is talk about innovation as it relates to the U.S., too. This is based on work we're doing with clients as Martin mentioned, and also for this we talked to about 25 different organizations, primarily multinationals who are looking at innovation. And I'd say that sort of the governing thought of the takeaway -- and you don't have to listen to me anymore. Basically, we're actually quite bullish about the opportunity in innovation but to be able to capture that two things have to be done and we think they have to be done pretty urgently. One is to what we would call just level the playing field. And we heard a bit about this this morning, just the gaps that are there and some of the essentials. And we'll talk about that for innovation to work. There are now gaps, or we're certainly hitting the flat end of the S-curve, if you will, for the U.S. compared to other countries. So we've got to level the playing field.

And we would actually also argue for a second initiative which is around a public-private cooperation. It's not having government decide which industries to go after but I think it is much more collaboration in focusing on some very important, big growth areas for the future and then looking at how to set standards, how to encourage and incentivize the investment and then the innovation, and to some extent the jobs, although I think I agree with Randall Stevenson this morning. The jobs are not, you know, we all want more jobs but we don't -- the objective function is not to create the jobs. Those come afterwards. So that's sort of the thought.

When we look at innovation just from the work we've done, and people have different theories about this, we look at five things that really drive innovation. The first is a large, and I would argue, demanding group of customers. And I think the U.S. for a very long time has been the biggest market in the world. It still is. We should recognize that even with the growth that's going on. But there are obviously shifts going on. But having a very large, significant market is important. And it's not just for the final demand. It's the feedback that you get from those consumers and customers.

The second is the deep talent pool, ensuring this is getting around the engineers, in particular, which we would also think is important. Capital. The fourth is infrastructure. And I would actually include in this digital infrastructure but also infrastructure such as the roads, the railways and so forth. Those are actually quite important as well.

And I think the fifth element, and I don't know how to describe this. It's -- there's the sense of -- there's a culture magic entrepreneurial way and there's something I know that Klaus and I have worked on. You know, Russia, for example, is very interested in many countries in importing the Silicon Valley to their country. And many of those don't work because they can put all the other ingredients in place but then there's this one element that's not there that's quite difficult to deal with. And I think we shouldn't forget that. So those are the five pieces.

What we would say just to rattle through where we are today is that it isn't so much about what we've done or not done, it's what the rest of the world is doing. And again, that was mentioned a bit this morning but the pace with which other countries are moving on innovation -- is it a different order of magnitude than what we're seeing being done in the U.S. today? And I talk even about -- I won't go through all the different five elements, but if you think even about the size of the markets, and we heard Jeff Immelt talk a little bit about that this morning, there will be 900 million new middle-class consumers in the next 10 years in Asia primarily. They're not U.S. middle-class consumers but about 15 to 20 percent of the disposable income. That is a very significant group in which to innovate. And that's why we're seeing a lot of multinationals do work in that area because that's where the market is.

We've heard a lot about the quality of the talent pool. Just another figure on here. You know, China's graduating about 10,000 engineering PhDs a year compared to the U.S. at about 8,000. Our rankings in the U.S. in terms of the, you know, if you look at the education scores, particularly in things like math and science. I think we rank 48th in math and science in education, according to the World Economic Forum; China is number 35; Singapore is number 1. And again, these are -- I don't think it's going to shift things overnight but these are long-term trends that we better start to focus on now.

The VC and PE. I think we've got obviously a dominant amount of that here but people are also looking overseas. And if you look at even what small countries are doing -- again, the Singapores, the Israels, and so forth, Korea -- with what small resources they have, the focus they're putting on that and trying to attract people to come there is very significant.

And then infrastructure. This is railways and the roads and the telecommunications and so forth. And I'll come back to this in the end. You know, it has deteriorated. And I won't go through the rankings but they're pretty poor. I mean, the American Society of Civil Engineers has given us a D on our infrastructure saying we need to spend about 1.6 trillion on that side. And there's various different rankings. I'm actually quite bullish about what can be done there and I think jobs can be created from it but we should just recognize it.

And then if you look at what other countries are doing, and I just rattle off some of them. Korea. When the new president of Korea came in he actually put out a 60-year vision. Six-zero years, which I thought was a big strange to do but this is sort of -- it's a long term and it's about green growth. And again, there's a huge effort going on to try and encourage and incentivize organizations in that country but also outside to be able to drive it. China, we all know, but I'll just take -- just take Beijing itself. The city of Beijing is putting $8 billion in R&D spending. Ken would know more about this than I would but again, a commitment around clean tech and electrical vehicles and what they're going to do about buying fleets and so forth.

Russia, as I mentioned, trying to put a Silicon Valley in place, drawing on people from all over the world to try and figure out how to make that happen. The EU, with their Blue Card Program, trying to attract more talent, especially scientific talent. Trying to get I think 20 million people over the next 20 years. And then Singapore. I could go through it but I would say one thing I've noticed over the last, I'd say, three to four years is a very significant uptick in countries. And it's not -- it's not the government so much doing it. It's actually a government-private sector linkage of people saying we've got to do something. And it's not to beat the U.S. or it's that we have to do something to drive it forward. There are big opportunities out here. Let's figure out how we can do it since the opportunity is there.

Again, I'm very bullish about what the U.S. can do because we shouldn't forget that we still are the largest market in the world and we will be for, you know, quite some time going forward. University leadership, 13 of the top 20 universities here. We've got a lot of things going. The demand. We did some McKinsey work on this. The demand for education in the U.S. and Canada among Asian postgraduate, postsecondary students is roughly 5- to 6 million people depending on different assumptions. Now, I'm not suggesting that we absorb 5- to 6 million people but I'm just saying the demand is there because we actually do have something that's quite good on that front.

So again, just to close, I think there's a couple of areas to work on this leveling of the playing field. We've heard about tax. I'm not trying to hammer on the tax but Randall Stephenson I think put it well in saying that's an area we need to look at. It's more about, again, what other countries have done versus what we've done. The tax rates have been dropped, and so looking at where -- how do we stack up on that side? We actually now have one of the higher tax rates on that side. Again, more what other countries have done.

And what I worry about on that side in particular is a lot of the multinationals that actually have a lot of cash on hand, about 40 percent of that is outside the U.S. It's very difficult for them to repatriate that back with the tax situation. I'm simplifying this probably too much the word is, but that's one issue.

A second area that I think is as, if not more important, is on regulation. I'll just give you one vignette. Talking with a medical devices company -- U.S. medical devices company -- it takes them one year to be able to develop and launch a particular product. It would take them four years in the U.S. due to the various regulatory sides of things. And we've got some very good regulation to protect people and so forth but there is a lot of interference on that side that we need to be looking at.

Another vignette I'll just give you is we talked about healthcare before. And this is not something that we'd be able to do in the U.S. now but there is a -- there are two organizations in India that have set up call centers with doctors. One of them has about 100 doctors in a call center. They have 5,000 medical workers that have basically 6 months training. So these are not people that are going to give you, you know, open heart surgery or anything like that but they can deal with 70 percent of the medical issues. And they cover a market of about 2.5 million people. Now, again, that's -- they don't have anything to start with so it's always easier to start from a clean sheet. But you've got to look at the sort of innovation that's going on. And I'm not suggesting we get rid of our regulation but we should at least benchmark where that is.

The other vignette I'd say is if you go to Beijing and talk to the mayor of Beijing, he has a chart on the wall which is the number of days it takes to start a business from the idea to opening it. It's 37 days. I never knew that. The other -- he doesn't have the U.S. or other western countries. The people he compares it to is Shanghai, they have their rivalries, but also Singapore, which is six days. And again, I'm embarrassed to say I don't know what the number is for the U.S. or for Canada, but I think we should look at that and try and make that as easy as possible, obviously with the caveats that we're not doing anything crazy but regulatory. So tax, regulation, education -- I think we've talked a lot about that today. I'm very much the believer, too, to emphasize more on the sciences.

One of the fellows was talking this morning. I was thinking about this. There's no -- we have *L.A. Law*. I don't think we have *L.A. Engineer*. (Laughter) Maybe something that we do on that front.

SPEAKER: I'm not sure it would sell.

MR. BARTON: The final, final point is I think there's a lot of areas for cooperation. Very deliberate cooperation between the public sector and private sector. We've just identified six. I think there are many more but these are huge business opportunities for the future. I'd say the whole life sciences farm. I'm aggregating that too much but on healthcare there's just a dramatic opportunity on that side. We talked about the IT enablement of health care that we need. When you look at things like the Broad Institute which I think is a world-class institution, bringing different bodies -- physicists, chemists, bio scientists, and so forth, and business people. I think that's a very large opportunity. There's no reason why that shouldn't be owned completely here in terms of what we can do and where we're moving.

Advanced infrastructure, high-speed rail, you just look at the opportunities, the air traffic control. We could go through a lot on that side. There is a huge opportunity on that front. And by the way, when you think about the capital that's required, one group that we don't think enough about are actually the Chinese. We think about the China Investment Corporation would actually like to invest money in U.S. infrastructure. But the challenge is again the regulation and fears they have and so forth. But why wouldn't we also be looking outside for capital to be able to do it. Again, that might be a naïve simplistic view but I think there's capital that's out there that would be interested in doing that on the infrastructure side.

Clean tech. We talked a lot about that. I think there's a very large opportunity. Clean coal, nuclear. That's a very big bucket that should probably be disaggregated. Then fourth would be next generation water technology. Water is going to be a huge issue for all of us in the world as we move forward. There are various countries trying to push on it. There's no reason why that can't be done here. IT infrastructure and the communication technologies. And then I'd say actually advanced materials, the composites and so forth that are there. We heard that a bit on the defense side.

Those are just six. I think there are actually many more. Those are big buckets of opportunities. And again, it's not suggesting that the government has to be there to, you know, invest a lot of money to figure out. It may just be about setting the standards or providing the regulatory timeframe for people to invest, or there may be some demand, benefits that we get from it. But I think a lot could be done that would attract the business leaders and the entrepreneurs and so forth. And even capital from outside the country.

MR. BAILY: Can I just follow up on one point? I think it was Jeff Immelt said this morning that the labor cost of manufacturing a lot of the products is very small. So the disadvantage the U.S. may have in having higher labor costs than other countries is actually not that much of a barrier. So in a sense it wouldn't take that much to make some greater production economically viable in the U.S. And maybe the things you mentioned -- taxes, regulation, the talent pool, and so on. Is that your sense as well from the client, the manufacturing or other clients that you worked with? It actually wouldn't take a whole lot if we could get the policies right and you could begin to see more of that activity moving, either staying in the U.S. or moving back to the U.S.?

MR. BARTON: I definitely think we could have more. I think it obviously varies by industry with steel versus the high-tech areas. But I think there's a lot more. And I think that's again where the dialogue would occur. And that's where I compare, you know, what we're doing here versus other countries where there's a lot of dialogue on that side.

MR. BAILY: Right. Right. I'm going to turn now to Klaus Kleinfeld, who I always feel better when I listen to him. He's got a very positive view of innovation in the U.S. and I think you're going to say a bit about how to revive that American success model. Klaus.

MR. KLEINFELD: Yeah, I'd be happy to. Let me start from where we started when we talked about this a little. I mean, when you face a challenging situation, whether it be in your private life or your business life or even with a the whole nation, my experience is you better build on your strength and don't wait until you can eliminate all of your weaknesses because you might not have survived it taking all the time to build on the weaknesses.

The good news here is there are a lot of strengths in the U.S. And a lot of the points Dominic mentioned as fundamental principles of five fundamental forces that you need for innovation. There is a reason why there is gazillions of people around the world that look at the U.S. and praise the U.S. as the model for innovation and for growth and for entrepreneurship. I mean, I'll give you a couple of those. And I'll also talk about some that -- at the end that I could see as potential drawbacks holding us back.

Let's start with the culture. I mean, the culture is probably the most difficult thing if anybody would ever want to copy that. And so many people have tried. And we always talk about Singapore but I mean, those of us who have worked in Singapore, I mean, know that even Singapore is far, far away from the ingrained, open culture here that we have in the U.S.

And how would I describe that? I would describe it in such a way that everybody kind of when you grow up, get to know, you better roll up your sleeves and be on your own because, you know, this is what this culture is all about. By the way, it doesn't matter where you came from. If you're good, you're going to find a way up through the ranks. It's a very, very -- a society that's very easy to penetrate. And if you're good you can make it, and by the way, the rewards are big, too. If you're good, you're going to be highly rewarded. There are gazillions of examples around -- have always been around and they today look at the Mark Zuckerbergs of this world and last century looked at the Henry Fords. You know, and that's part of it.

Another big part of the culture is failure is not seen as deadly. And that's a big, big difference to almost all cultures around the world. I mean, most cultures around the world, if you started a business and you failed in the business, people would put a print on your forehead and nobody would want to touch you. If you go around -- if you go around and talk to the venture capitalists, I think the general understanding is when we look and put teams together, we put a lot of money behind and we want them to have had some failures. Why? Because we know that they learn best out of their failures and they will never repeat them. Right? So those are things that are going big time for the U.S. Right?

The other thing that's going big time for the U.S., and that's impossible -- almost impossible to copy -- very, very hard to copy -- is some clusters. And we have this gigantic cluster that's called Silicon Valley, right, that has all the elements and even more. And that really dominates some industries and that really is encapsulated in a physical space and has an unbelievable vitality. That, I think, is the reason -- I unfortunately wasn't here listening to the first panel this morning. I was still digging myself out of the snow over in New York. So but there's a reason why the first panel sat in the media industries. We are the ones.

We are dominating. And the reason for that is because we have this gigantic cluster and we invent new business models every day. And there are thousands of new startups. Let's not forget about that. And that's just one example.

I mean, you can look at some of the technology sites. And some of those were mentioned before. We have a similar cluster around Boston in the medical space, in the biotech space, which I think we're only partially aware of. And the question is, you know, are we really talking about that -- about that enough? Right? And then we have a big cluster in New York, the financial industry, where we used to be a leader under we really screwed it up. Right? And now, frankly, I mean, the good news is people forget and forgetting usually goes pretty fast, you know, and the cluster is still there so I'm pretty optimistic about that coming back.

(Laughter)

So on that point I think we have a lot of these great things. Education. Yeah, I could talk about the bad schools, you know, and I know some of them fairly well. But frankly, I mean, 20 of the best universities around the world, I mean, 13 of those are in the U.S. And if you look at the last statistics, I mean, if you look at probably the most sensitive indicator for attractiveness of a country and a nation you have no other country on that planet where more people are knocking on the door wanting to become a citizen than the U.S. That continues to be the case. Yes, there is competition coming on, but let's not ignore those facts. If we don't screw that up, and if we don't continue to emphasize these points, you know, we can really screw it up big. I mean, and we are on some of those elements because we have been the last years because we went through this tremendous crisis. We have been emphasizing the negative because it was stuck in our face. Right? It was unavoidable. Lots of stuff going on there. But in the end let's emphasize the positive because we need this to create a better future.

So now let me focus a little bit on those elements where I think we probably need a little bit of reinventing. And this model which I just described works very, very well for some industries. It doesn't work so well for others. And the others typically have one indicator -- one other element in it and that is kind of government -- I wouldn't call it regulation, but framing. I would call it a framing process. I'll give you an example. I mean, I was born in the north of Germany and I used to go particularly over the change of the year up to the very north of Denmark when I had just finished school and was visiting university. And this was the early '80s. Right? The early '80s and we actually rented a place out there, an old farm. And one day my old friend there, Jacob Jorgensen says, oh, Klaus, I will build next year a windmill. I said, oh, Jacob, that's a great idea. Build a windmill, you know. And I said, Jacob, I said, how are you going to do that? He said I have no idea. And the Internet wasn't really around at that time. I'm going to do a little thinking. You know. I saw some of these western movies and from the farms, you know, they had these windmills to get the water up, you know. I said that's good. But do you want to get the water up? We have water. We have running water on the farm. So no, no, he says. No, no, no. You know, the government has done something. They are now talking about this. They actually think that if you have a windmill and you produce more electricity than you actually consume, you will get paid by the utility. And they are considering putting that into a law. And I said, Jacob, that's a good idea. Good.

The next year I come back and he has that bloody windmill on there. It looked like total crap. Total crap. What has happened is one single piece -- one single piece of legislation had been put in there and that single piece -- simple, super simple was if you have a windmill in Denmark and you produce more energy than you consume, the utility will pay you for every kilowatt that you put into the network the price that they charge for the end consumers. So there's gazillions of farms in wintertime there's, I mean, a lot of boatbuilding business there. Wintertime you hang around, you don't know what to do. Boatbuilding is a very manual process. You have a little workshop. And guess what? That's why the windmills look the way they do these days. A lot of carbon fiber in there. A lot of basal woods in there. And if you see the manufacturing process, that is a process that stems from boatbuilding. Right?

Now, coming to that, a little nation like Denmark can dominate in the windmill business. Right? And not because the consumers happen so much in demand. I mean, it's because there was a little bit of a frame, a smart frame, one single piece. One single piece can make a big difference. Right? So we -- and that's a small industry. Right? Now, when you think about, for instance, a bigger issue like CO_2-free coal fired power plants many would say that's impossible Klaus. Yeah, well, we've said flying is impossible, and thanks to aluminum we all fly well today. (Laughter)

So I think you get what I'm saying. Right? So I think if we were to say let's have a program put together with some bright, intelligent scientists and figure out a way how we can build a CO_2-free coal-fired power plant, I'll tell you what, China, it would be hot in demand there. Hot in demand because -- and that's not only China. In the U.S. actually it would hot in demand, too. But it's very difficult for one company alone to do that. And much of that deals with the brainpower. Much of that deals with the brainpower because it really requires not entirely a fly to the moon project but something of half of the magnitude of this.

And there are those type of large scale innovation where there's a huge demand on this planet and where probably the U.S. could be dominating the world. You know, but where we have got the mechanics of what Dominic, you described when a leader comes in, put a six-year perspective on it. The reason why he does that is a CO_2-free coal-fired power plant everybody knows in 10 years we probably won't have it. It probably will require 20 years. And if you want to have those type of big ideas, you know, you need a longer timeframe. And we have kind of deprived ourselves of that conversation. Right? And I think we have to bring that conversation back. Without this kind of aftertaste of oh, my God, we're talking about industrial policy. Right? Because that has -- I learned it the hard way, that has this very negative connotation here in the U.S. and that's not what I'm talking about.

I'm talking about we want to participate. We want to participate in the future as we have always done. I mean, we invented here the airplane. We invented the automotive. Come on. Give me a break. What's the next big thing? I mean, we always thought big. Right? We flew to the moon. Right? Let's think big again. Right? We can do it. And thinking all of the positive things that I said in the beginning, let's bring that back. Right?

Okay. Another thing is, and I think that's a strong point, Dominic, you made it only a small point. I believe it's a strong point. I mean, you said *L.A. Law*. *L.A. Law* to me is one of the better shows. Right? (Laughter) I say intellectually better. At least it has substance. You know? I say -- when I took my older daughter to go on a college tour, and we went to MIT, all right, and looked at MIT, I was in the room and I looked around. It was a room like this filled, right? I was probably the only Westerner in that room. Very few Americans, right? And it was filled with Indians and Chinese. Right? I love that. I love that because it shows on the one hand that this place is gigantically attractive. Right? But why do the kids, when you talk to the kids then which I did, I just asked them why did you come here? You see in their eyes they aspire to come to MIT. MIT is for them. If you can make it into MIT you are there. That is their role model. Why has a role model in a 13-year-old, 15-year-old, 16-year-old been carved like that in India and carved differently here? I mean, I don't believe that we cannot influence the kids in the same positive way. They want to do something good. Right? They want to -- they don't know -- just think of where we were at that time. We didn't know how the world really operates. We have to provide them some ideas on how the future can be.

They love Mark Zuckerberg. Right? They love Steven Jobs. Right? They love to look at a guy like Bill Gates. Right? So they even love to look at Donald Trump. (Laughter) It worked. It worked. Suddenly -- I think it's a great show actually. I think it's a great show. (Laughter) But because it emphasizes some of the things that we need to emphasize to get the young society up to where we want it to be. Right?

But if we allow the Snookies of this world (Laughter) to dominate our societal discussion for the young, right, and I also believe that if we allow the infiltration of what we call soft drugs in our high schools and colleges, we have an issue. And we have to address it. And we can address it. And it's looming in almost all families from at least the debates that I'm hearing, right, because we're all equally concerned, right, and I think that is another aspect where we have to talk about more about those that have been successful, have some TV shows on there, talk about those. Those are great people and they are great role models. Right? So let me close with that. (Laughter and applause)

MR. BAILY: Thank you. Very wise words. Taste in TV? Not so much. (Laughter)

SPEAKER: I like the dating show.

MR. BAILY: Let me just follow up very quickly. So at least part of your message was we need the sort of smart regulation. We don't regulation which is going to hold back entrepreneurship, but at the same time we do have a role for government in these major technology projects. So can we --

MR. KLEINFELD: I would say it further. I would say it further. I would say you need a societal dialogue. It's not just the role for government because you also need to capture the angst that is in the working people in America. You know, you need a dialogue that happens in the open. Right? We have to go away from the points of all manufacturing in the U.S. is not possible. I think what Jeff Immelt said this morning is absolutely correct. In our industry, manufacturing costs, labor costs, I mean, irrelevant.

MR. BAILY: Thank you. I'm going to turn to Austan. There is an administration manufacturing policy and I think you've also put out stuff on innovation. But let me ask you to sort of respond to these comments and talk a little bit about do you think those policies are working -- will work? And what do you see going forward?

MR. GOOLSBEE: Well, yes. They will work and they are working. What policies were they? (Laughter)

MR. BAILY: This is the comedian part of you?

MR. GOOLSBEE: This is the (inaudible) manufacturing policy. You talk about currencies. I assure you're the working. (Laughter)

Where I was going to start, I mean, it's funny that we moved more and more into the cultural kind of explanations, about as far from where economists are as can be because we don't deal with humans, you know, we're economists. But I think there's an overwhelming bias toward the present in almost everybody, in financial markets, among economists, among your mom, among everybody. And when I was at Chicago I used to drive the carpool of a bunch of kids down to school. And one of them had gotten this game Guitar Hero and he was passing the manual around and our daughter was in there and they pass it around and they had Guitar Hero '80s Edition. And I said let me see that. And I looked at the thing. I said, oh, yeah. I remember all these songs. And the kids said, Mr. Goolsbee, you were alive in the 1980s? (Laughter)

He wanted to know did I know Babe Ruth personally or this kind of thing. That -- we laugh at them for being five-years-old, but we have the same mentality depending on what your age is. You will remember we've gone through over the last 25 years two periods where the business cycle was ended and there weren't going to be recessions anymore, two periods where we had jobless recovery and there would never be jobs, and now we go into worse depression -- worse recession since the Depression. And the argument is we're toast. We're done. We can never come back.

Okay, well, now the data is actually coming in. People are looking fairly optimistic. There's a significant amount of money on the balance sheet. Corporate profits are setting records. It's true we have experienced a very traumatic event, but phase one of both government policy and the economy feels to me like we've come to the end of phase one. That was everybody's afraid we're in freefall and there might not be an economy sometime in the near future. And the policy response was about how do we stop a freefall? Look, you can be on whatever side you want. We can argue about each individual component of what the Fed did, what the administration did, whatever. We aren't anywhere like -- we aren't in any situation like where we were two years ago. If you don't think that's true, you simply don't remember what it was like two years ago. You had Congress people telling their wives to go pull all their money out of the bank. You had people, I mean, it was a very frightening moment. I think it really could have been the Depression. In some ways it could have been worse than the Depression because finance is far more integrally tied up with the rest of the economy than it was in 1929.

So we avoided that. We now move into phase two, which there is a lot of uncertainty and we're gradually coming out and productivity was high and now output is starting to rise. Job creation naturally comes from output growth that you can't just satisfy with productivity growth. And that is starting to -- we're not going to have nine percent productivity growth on an annualized basis. I mean, maybe we can. That would be wonderful. But I don't think we're going to have that on some sustained basis. And so our output expansion, they will have to start hiring people. And you have started to see that.

Phase three is where we ought to be thinking, and that is what do we want to grow into? Where does the economy go? A key component of that is innovation and technology and education and immigration and the culture of entrepreneurship. All of that is true. But remember, there's two things making this painful. One is when you come out of a financial crisis-induced recession it's always painful. Always has been. Every country of the world and in the United States whenever that's happened it's hard -- it's painful to come out of it.

Two, we've just gone through a boom that was fueled predominantly by excessive consumption growth faster than income growth, literally bringing the U.S. savings rate to zero and below. If you added up all the personal savings of the United States in multiple quarters in the 2000s, it was less than nothing. So that was an artificial frothiness to growth. And the second was residential construction fueled by a housing bubble which was also not sustainable. So we have to shift back to a more traditional kind of a business cycle, recovery through business investment, through education, innovation in our own people and through exports. We want to increase exports from the U.S. One major component of which is stuff that we sell people in foreign companies here, we sell it here in the United States, including education. If a foreign student comes to the University of Chicago to get an education, that counts as an export for the U.S. And last year we exported substantially more educations than we did computers. Than I'm sure we did aluminum. Than a whole lot of things.

SPEAKER: Sadly. (Laughter)

MR. GOOLSBEE: And in some ways -- sad on both sides, you know, internally we need to recognize -- the rest of the world recognizes, hey, they've got a good thing going. And it's not that we've gotten dumber. It's that everybody else realizes what they're doing is working. So we always had -- we led the world in the share of 25-year-olds with a college degree. Our rate has not gone down. It's just that a whole lot of other countries said that's a good combination. If you've got a lot of college graduates you've got high-paying jobs and high-skilled work and you track good industries. And so they put a huge focus in trying to up their shares. And the U.S. has now fallen behind.

Now, I guess we've caught up a little bit. In some statistic, we were number 17. I think we're now number nine. And we were just below Bulgaria and just above Costa Rica. Now, I said -- I had a graduate student who was from Bulgaria. He said what are you saying about Bulgaria? I said, look, I'm not saying anything. What did I say? If you're educational level is just between Bulgaria and Costa Rica, 25 years from now your income level is going to be somewhere between Bulgaria and Costa Rica and that is not the American conception of, yeah, okay, maybe we'll be somewhere between 41st and 72nd depending how many new countries are invented, you know, and the other ones break up.

That's not our thing. We are going to grow our way out of this. When we get -- as the fire starts heating up people are going to fell a lot better. They always have. We were alive in the 1980s. We're going to be alive now. We're going to be growing in the near future. You've already started to see it. And people are going to start saying, hey, we weren't in the dumps as everybody said. We're a lot better off. You know, remember, China is growing fast. We're 12 times richer than China. They could double their incomes. We'd still be more than five times richer than them. A lot of the growth rate in developing countries comes from having a very low base. Okay, there are a lot of strengths in the United States and I think that in the language of the economic growth formula it's sort of K, H, and A. It's expanding the capital stock and encouraging investment. Where there is funding now sitting on the sidelines ready to come in, they didn't pay it out in dividends. They didn't say there are no investment opportunities in the U.S. Businesses sat on the money and they're now, I think, starting to use that money and we're trying to use tax policy and others to encourage them to invest here at home.

H is human capital and investing in our own people. That includes innovation, R&D, as well as K-12 education and higher education. We know we've got to do that to be competitive in the long run and we should. And A is technological advancement, which the U.S. has been a historic leader. It has also had a major component coming from the government that national laboratories, the NIH, a variety of research and development funded through the National Science Foundation, through AARPA, through the Energy Department, have always been basic building blocks that could be commercialized and turned into massive commercial success for U.S. companies. And many of those benefits have saved our lives. They keep us alive longer. They've lit our houses. They've done a bunch of wonderful things for our standard of living as well as employed our people. And we shouldn't forget that.

The first thing to me that feels like it's caught in a crisis are investments. Because we have a bias to the present you say, oh, my God, we have no money. We can't afford. Let's deal with what's going to be 10 years from now when it comes. Right now we've got to consolidate. And that is an impulse we've got to push back against. We've got to be about a growth strategy. If we are growing there's virtually nothing we can't do, whether it's fiscal consolidation, whether it's innovation, whether it's making the investments we need, getting people -- motivating them to want to go get higher education in engineering. If we are growing, people are loving it. They want to go -- if you're in the 1990s and we're adding millions of jobs and people are getting rich in Silicon Valley, every kid wants to go to Silicon Valley. They say that's for me. I want to live that lifestyle. If we're in the dumps, people are going to find something else to do. You know, we're going to watch the Super Bowl. The guy says, well, you know, I guess I'll fall back on my second option being a Super Bowl quarterback. You know, put the focus in a different place.

So I think K, H, and A are where we've got to -- we've got to fundamentally be about that. And that's not just for a thin crush of people who have a PhD in electrical engineering. I want to emphasize that. If you start looking at broad sectors of the American economy, whether it's retail, services, manufacturing and different others, improving productivity and innovation has delivered very high standards of living for average Americans over time. The last 5 to 10 years we've kind of broken that change that the growth rate of the country is tied to the growth rate of the middle class. And I think those two things have got to be tied together.

I'm sorry to go on a little longer but that's my view.

MR. BAILY: Thank you. Well, this is our second panel to take a swipe at sports and I do want to acknowledge that it is possible to be both a sports fan and interested in technology. And Glenn is an obvious example. And I would put myself in that category.

We have time for two quick questions because we've sort of run through our time a little bit. So can we get a couple of questions? Yes, one here. Can you make sure it's a short question?

SPEAKER: (inaudible). Thank you to Brookings for organizing this event. A lot of eminent people came and spoke but I think this panel is one of the best and one of the most inspiring. And everything that you described about being innovative and being creative and bringing in smart people, I think that me and a lot of people like me actually embody that. And even this panel embodies that because of the four people here, two of them -- one is from Canada and the other is from Germany. So one of the most attractive things about this country is that it attracts smart people. And the same thing that you said about MIT, I can actually vouch for that because currently I'm working in collaboration with MIT to create the next level of Internet. So the first was connecting the computers, next was connecting information through web pages to hyperlinks --

MR. BAILY: I like what you say but you've got to keep it a little short.

SPEAKER: Yes.

MR. BAILY: So can you get to the question?

SPEAKER: So one of the things is attracting very innovative people. And as companies which are (inaudible) other countries you see your business as a global business and why do you want to just focus on one country because you are a global company -- McKinsey, Alcoa, et cetera. Instead of just focusing on one market, to create jobs in one place, why don't you actually expand and see the whole world as your platform to grow upon?

MR. BAILY: Let's take a second question and then we'll get a response. Yes. Over there.

MR. EICHISON: Thank you. My name is Eddie Eichison. I'm part of the union movement. And I've heard consistently that labor costs are irrelevant. I know I've seen actually much more pain now than actually in 2008 and no one has really talked about that. They've talked about how innovation can take place without labor and I'm asking the question as to what are we going to deal with the proletariat, maybe, you know, the lower middle classes?

MR. BAILY: Okay. A couple of tough questions. Do you have quick responses? Why don't you start, Klaus?

MR. KLEINFELD: On the immigration front let me start with that. I think you were spot on. I think this is -- I think I said it. This is one of the beauties of this country, that it continues to attract the best employees, not only through the top universities but in general because it's such a great country. Right? And freedom. The concept of freedom is ubiquital, I mean, attractive concept. So, and somebody who has not had it appreciates it even more. You know, so I think here at Brookings the best piece I have seen recently was a piece from Darryl, I mean, written on immigration. You know. And I think that we have to be super, super clear on getting our immigration policy back in shape. And I think it has gone into the wrong direction after September 11th and we have to bring it back in shape.

I mean, to get people educated here, attract them here and then send them back, you know, or force them to go back -- it's not sending when you're forcing them to go back because they would love to stay here. Not a smart strategy and, I mean, not a very good value creator.

On this other one, I mean, my take on that is -- I said this at the end, I think we need a broad dialogue. And I think there's plenty of jobs also for people that are not so well skilled. And I've seen that but you have to change the model on how you deal with unemployment. And you have to put more options around reeducation. I think you have to put more options around also -- and it can be done with the unions, in cooperation with the unions. The big question is what's the future role of the union? I believe one of that is to provide a better guidance for how do you skill yourself. Because companies, as much as they are socially responsible, I mean, cannot guarantee lifelong employment. That would be unrealistic to say that. Right? But what we can do is we can provide skills. Right? And I think to help people navigate better through the jungle of what skills will be valuable in the future here, I think it's a great, great asset. And I've seen -- I've seen -- I mean, we currently have a situation. I don't know whether this was addressed here, where in the U.S. we have too few welders. You know, now welding is not that difficult to learn. Right? So I don't understand why that could happen. You know? We're seeing that the population is aging, you know. Just try to find somebody who is qualified to take care of your mother or your father when they are old. Right? Very, very difficult. The job to do that actually needs a human. It cannot be automated. In fact, the elderly person cannot be moved. So it will not find the way of being outsourced to India. But what we do need is we need qualified people that want to do that. Right? And I have millions of examples of that, right, but I don't want to --

MR. BAILY: Dominic, do you want to say a couple of words?

MR. BARTON: Maybe two seconds. I think on the talent side we clearly want to go where we can find the best talent in the world. And with 13 of the top 20 universities being here, when we're hiring for our German office, Madrid office, Nigeria office, we find a lot of the people here as well in those places. So it's -- I think it's part and parcel of the strength of here.

And I think on your point of the proletariat side dealing with the lower skilled workers, I think one area that we don't talk enough about which we should are actually polytechnics. We focus a lot on higher education which I think is important, but polytechnics, the welders, the radiologists, they're very important. I think this goes with the immigration. The service industry plays a very important role I think in this country in developing and training workers and the group through it. So I think polytechnics is a way where we can help build some skills quickly.

MR. KLEINFELD: And actually learn from other countries.

MR. BAILY: Right. Right. Absolutely. Austan, do you want to have the last word?

MR. GOOLSBEE: I just say to that this was the first boom -- 2000 was the first boom in U.S. history that we have data on where the median family's income fell by $2,000 over a boom. A whole lot of bad things happen when the middle class is not tied to overall economic growth. If that is not broad based it's, in my opinion, facilitates asset bubbles, tends to be high concentration of investment driven in small sectors, and difficult to sustain. So I think we've got to embrace that broad-based mantra.

And I think when the economy is coming back now you are likely to see movement in the direction that people are going to be feeling a lot better about -- we've gone through a period that appeared to pit the interests of businesses against the workers where they say, look, we've got to find ways to save money and the best way for us to do that is get rid of all of our employees. And it appeared to pit productivity against labor. Obviously, over the long cycle of U.S. history, productivity growth has gone into wages. And I think we've got to get back to an environment where business is growing, the workers are also benefiting, the middle class is benefiting, and I feel like we are about to -- we saw that in the '90s and it feels like we could be on the cusp of a beginning like that now, too.

MR. BAILY: Thank you very much. Well, we've run out of time. More than run out of time. I would like to thank our panelists who I think were absolutely terrific. (Applause)

MR. THORNTON: Okay. After this rather extraordinary day of fascinating people and interesting ideas, we're going to finish with, I think, the most interesting session, if I do say so, (Laughter) with Valerie Jarrett, who, of course, needs no introduction. I'm not going to spend a lot of time introducing her because I'd like to get right into the substance of the day, except to say one thing by way of really compliment and background. And that is that I remember we had a Brookings trustees meeting in June of 2009 -- I guess it was 2009 -- as a result of which a number of us started talking about this very initiative that Glenn and Dominic and others have been spearheading. And after that meeting where we had a couple of members of the administration come talk to us I got a phone call out of the blue from Valerie Jarrett. And so I called her back and she explained who she was. And I said, no, I know who you are. (Laughter) And she was seeking input on the administration's thinking on the business community.

I mention it because she and I have been in contact a number of times since then and I've always found her extraordinarily responsive. The top 1 percent of the people on the face of the Earth who will get back to you straight away and are, like, very, very interested in getting feedback, ideas, criticism, praise, the whole thing. So I want to get that by way of thanking you.

MS. JARRETT: Thank you. And with that, I'm going to leave now because that's about as good as it gets. (Laughter)

MR. THORNTON: Okay. So why don't we start at the sort of highest and broadest level by saying this, during the course of the day, I was struck, anyway, by the really broad agreement on what the issues are facing this country and the fact that the country needs and everyone wants to express some kind of national strategy and then some ability to execute on that strategy in a variety of different ways.

And so, since you are so much at the center of things and you're working for the President, it would be a very interesting thing to start by hearing from you how you articulate what the President's strategy is and what the priorities are and how you feel about our collective ability to execute on this.

MS. JARRETT: All right. Well, first of all, thank you for having me here. I've been getting reports throughout the day and then I was just briefed about, really, the remarkable dialogue that you've all had. And it's music to our ears because your strategy is our strategy. And just knowing that you're focusing on competitiveness and jobs and innovation and ways of making sure that we position ourselves so that our companies can compete globally and invest here in the United States is exactly what the President's agenda is: jobs, jobs, jobs. And so to know that there is a group of this caliber that's willing to engage and work with each other and work with the administration towards that common goal is just terrific. And so I thank you for all the work that you have been doing over this tough economic time.

And I think as we move forward there are going to be so many ways that we can work together and have a true partnership. And one thing that we're very confident about is that no one person can solve the challenges that we have alone. And it's going to take an ongoing, sustained effort of engagement and hard work, and there are going to be many areas where we completely agree. And it sounds like today there was an, you know, absolute unanimity around this central theme of making sure that we stay competitive and that we invest in the United States, and that we support innovation and new technology and educate our workforce to be able to compete in this global market place.

And there are going to be times where there's going to be some tension and I hope that what we are able to do is have the level of cooperation and dialogue so that we can push each other and encourage each other and find where there's this enormous opportunity for common ground.

MR. THORNTON: So tell us, among the various priorities the President has got, of those priorities which do you feel most confident about or comfortable are likely to get done in the -- let's say, the next 12 to 18 months?

MS. JARRETT: Well, the number one priority is we've got to bring down the unemployment rate and we have to create jobs. And so, everything that we're going to be doing is going to be around that central theme. And there are a lot of different ways that we can do it, and I think that in the coming weeks, when the President gives his State of the Union and when he unveils his budget, you'll be able to see his roadmap and his vision more clearly.

But what I would say is evident to us all is that there's a limit to the market here in the United States, so we're going to have to support exports. That's a big priority. The President named Jim McNerney and a whole board to focus on exports last year and we want to continue their work to figure out what are the levers that we can turn to open up those opportunities. The President had a very successful trip to Asia at the end of last year and part of the challenge is to demonstrate that when a company -- such as a Boeing or a GE -- gets a contract in India, that actually creates jobs back here in the United States.

And we have to educate everybody in America about what those opportunities are for them right here as a result of those export opportunities. The vast majority of the market for our U.S. companies is, obviously, outside of the United States.

First and foremost on the horizon, in terms of legislatively, I think everyone's aware that we reached an agreement with South Korea for the South Korean Free Trade Agreement. It is going to be vitally important to get that agreement approved by Congress. And it's going to be important that there are validators throughout the marketplace who explain why this is so important to this country and the opportunities that will be available to U.S. companies as a result of that free trade agreement.

And I think it's really -- we use that as a good example of really what the President's strategy has been because he wanted to make sure it was a good agreement not just for U.S. companies, but for workers as well. And this is the first time in a long time, if ever, we've had a union stand up and support a free trade agreement. So to have not just Ford Motor Company, but the UAW say, yes, we think this is going to be good for our workers as well as for the businesses, it sends a very positive signal. But we have to get it approved through Congress and I think if we get that approved, and we follow with Columbia and Panama, we'll begin to see some momentum in the free trade agreement and that will create very real jobs back home. So that's an important legislative agenda that we have.

Infrastructure is another important topic and I'm sure you guys covered that today. And the President has an Economic Advisory Council -- PERAB we call it -- that very early on came up with a suggestion of an infrastructure bank. We're tickling that out and trying to figure out is that something that's really workable because the theory behind it would be not just that you'd have public dollars, but you'd have the opportunity to get private investment as well that would leverage our public dollars.

And one of the clear ways we're going to be competitive in the future is if we build our infrastructure back here at home, both the roads and the bridges, and the transportation, and the broadband and telecommunications, and also our human capital. So these are priorities as well. And I think what you'll find -- again, back to the President's State of the Union, and also the budget -- is that we have to talk about what we're going to do to bring down the deficit.

And the President, as everyone here knows, appointed a Fiscal Commission and really gave them the charge to figure out ways that we can tackle the deficit. And he's directed his budget director to take a hard look at those findings and recommendations and incorporate what he can into the budget recommendations that are made to the President. Because at the same time it was important to jump start the economy in the first couple of years when we were in such a terrible condition, it's going to be also important to tighten our belts just as every business around the country has had to do as the economy starts to recover. Yet we don't want to, as we're tightening our belts, jeopardize the levers that we have that are going to grow the economy.

So education is something that we obviously have to continue to invest in. Research and development, something we have to continue to invest in. Clean energy, something we have to continue to invest in, and infrastructure. So we have to get the balance just right and that's what government's supposed to do, is to create and foster this climate where the private sector is induced to invest and grow and be healthy. And doing that in the midst of an economic challenge and then a fiscal challenge is hard, but that's what we're up to.

MR. THORNTON: It seems to me, just looking at it from the outside, that in the lame duck Congress you obviously had a very good run of success.

MS. JARRETT: We had a good run.

MR. THORNTON: And it also seems to me, sitting on boards of directors and trafficking in the business community as I do, that both the business community and relations with Congress have taken a turn for the better. And I'm interested to know, you're sitting on the inside, again, how you feel about that? And whether or not you feel -- are there legs to that or was this sort of a one-off and then we retreat back to the bad old politics of --

MS. JARRETT: Well, I'm very optimistic and I think there's some very good signs. And taking them in order, in terms of the business community, I think we should go back and look at the situation as it was when the President came in. He had to take some very bold, decisive steps, some of them not popular, in order to right the economic crisis we were in, to get us on a better trajectory.

And we also had to pass big pieces of legislation that were important and get them done and get them behind us. So financial regulatory reform, health insurance reform were all a lot for the business community to digest. And so I think that it was important that we do them and get them done and get them in place so we had rules of the road and we had a better opportunity of controlling our deficit. And I would remind everyone, one of the key benefits of health insurance reform is it will enable us to bring down our federal deficit over the future.

And so getting all of that in place creates a certain level of uncertainty, let's face it. Now that we're moving past that phase and we're moving from the recovery to really rebuilding our economy, we think that there's enormous opportunity for cooperation.

In terms of the lame duck, it was very successful. And I think what we saw was a willingness for everybody to give a little bit, to have continuous, ongoing dialogue, which is always constructive, and to really put the American people first. And I think that now that the Republicans do have control of the House there is a responsibility for leadership, and that's a good thing, and that they will work with us closely, we hope. So we are very optimistic and I think that the success of the lame duck -- there's nothing like success to breed success.

I think everybody left at the end of the year feeling that we got an enormous amount accomplished, far more than anybody would have predicted we were going to get accomplished, and it felt really good. Let's face it, it felt good. And so I think if we can bring that spirit back as we begin the new year, and there are many areas where there is going to be this opportunity for bipartisan support -- I think the free trade agreements are an opportunity if we all do our part and educate everybody about the benefits of the free trade agreement.

Education is another area where there's an enormous amount of bipartisan support. And I think Arne Duncan, I've known him since he was in diapers -- which shows you either I'm old or I don't know what, I've got a good memory -- but to have somebody of his caliber who is willing to be courageous and try new things all around the country and to really put the children first and to be interested in communicating with the marketplace. And I know Arne's talked to hundreds of business leaders in the course of his two years, to say to them, you know, what are the demands that I should be meeting as we educate our children? What is it you're going to need in the economy of tomorrow?

So I think that there are enormous opportunities for ways that we can cooperate. And I think the business community has been very helpful in helping us think through what are the right levers for you. And so whether it's the tax credits for a wide range -- I think we have 16 different tax credits that the President has passed just for small business since he's been in office. So taking our lead from you and figuring out what it is that we can do, give us opportunity for cooperation with the business community. Now that the ship is a little steadier, I think you'll see that some of the areas where there was inevitable tension fade away and areas of great cooperation are ahead.

MR. THORNTON: Okay. I'm going to open it to the floor in one minute, but before I do that I'm going to ask each of the two Brookings scholars, Martin and Darrell, to summarize briefly for Valerie your most recent ideas, because I think we ought to contribute some intellectual content to her. (Laughter)

MR. BAILY: One of the things -- my jumping off point was the comment that Larry made when he left the White House, which was that we need to learn to adjust to China. And clearly the United States has to increase exports. You mentioned that as being one of the priorities. We have to reduce our trade deficit and that means we have to become more competitive in the manufacturing sector.

MS. JARRETT: Yes.

MR. BAILY: The service sector is strong. We have an export surplus in services, but we can't get there without manufacturing, and a lot of people feel that we're losing ground at this point to China. So what's our response to that?

I think there's some misperception there a little bit. I think the United States still has very much the edge in terms of innovation and technology. We still have the leading technology. We're still a very innovative economy, but we have to try to shift to the point where we don't just do the innovation, but we actually do the manufacturing here in the United States.

And I think there was a lot of discussion on the panels today about making sure we have the right environment in terms of regulation. Taxes, which I know is a tough issue, and the skills, the education to make sure that that manufacturing occurs, as well as the innovation, which we're strong on.

MR. THORNTON: Darrell?

MR. WEST: Another topic that has come up today is the subject of immigration and there's been a lot of concern about inaction in that area, the inability of Congress to do much with that issue. The DREAM Act came up during the lame duck session, got a majority in the House and a majority in the Senate, but not meeting the 60-vote threshold. And we had discussions about the need for high-skilled workers. There's a need for low-skilled workers in certain key industries: hotels, restaurants, in agriculture as well. So I'm just curious your view about what we can do on immigration and how you think that issue will be addressed in the coming Congress?

MS. JARRETT: Well, I'll go backwards. So let's start with immigration. I think the President said in his press conference right before he left on vacation at the end of the lame duck that his biggest disappointment was that we weren't able to get the DREAM Act through and it wasn't the comprehensive immigration reform package that he supports. And so think of ways that we can tackle that issue collectively and approaching it in a way that is more palatable to Congress is something we're interested in doing.

We don't have the votes right now. We didn't have the votes at the end of the lame duck to get a reasonably uncontroversial portion of comprehensive immigration reform done, so we know we don't have the votes to get the whole comprehensive done now. But we have to think it through and we're open to new ideas and suggestions for how to do that. I know you guys were talking about how when we're educating terrific people here in our universities -- the best universities in the world -- and that we're losing them because they can't stay here. How are we going address those kinds of issues is something we're very interested in and obviously needling through with you.

We had a meeting this morning on manufacturing. Jeff Immelt was actually over at the White House and we were talking with him. And Gene Sperling, our new NEC director, is very interested in figuring out how we can support manufacturing here and there are a wide range of ideas and suggestions. We're always open to what you guys think would make sense, but it's certainly going to be a priority of the President to figure out how we grow manufacturing here in this country, so I couldn't agree with your comments more.

MR. THORNTON: Okay, I'm going to open it to the floor. What I'm going to do is I'm going to take two or three questions at once and then let Valerie pick and choose which she wants to answer. Lady in the back?

MS. STERN: Hi. I'm Paula Stern. I used to chair the U.S. International Trade Commission, and I'm speaking and asking you a question on behalf of the National Center for Women and Information Technology. And I would like to marry the comments that you made about

Secretary of Education Arne Duncan and his concerns, asking the business community where the demands are for the types of skilled workforce that they need to be the manufacturing giants that we have been in the past and hope to be in the future.

The NCWIT -- the National Center for Women and Information Technology -- has actually started going congressional district by congressional district looking at the openings that are not being filled in IT -- information technology, computing science, engineering, et cetera, and then looking at the schools and what they're doing in those schools, community colleges, or even in the universities in those districts. And we simply have a mismatch -- a disconnect between the skills that are needed and the skills that being imparted to our young people. And I was wondering if in the State of the Union, Secretary Duncan is going to be encouraging the President to kind of unpack this whole disconnect, particularly in STEM, and focus like a laser on the fact that we don't have the skilled manufacturing that combines information technology and computing sciences?

MS. JARRETT: Well, I'll mention two things in terms of what we're already doing. And you raise a very, very good point, there is a disconnect.

A couple of things. CeeCee Rouse, who's on Austan's Council of Economic Advisors and a labor economist, has been looking at is there a mismatch? Is it along geographic grounds or, you know, how does that mismatch actually occur? And she hasn't reached conclusions yet, but I think she'd be interested in talking with your folks and trying to compare data to see where this challenge really is.

Two more things. The President's Advisory Board, the PERAB, through Penny Pritzker's leadership, has created this initiative, Skills for America's Future, where we're working with the community colleges and the private sector, and trying to get employers to help work with us to identify what are the skills and the demand that they have and then matching it up and tailoring community college programs to those needs. So I think that's very important.

And then, finally, I'd mention that Ursula Burns from Xerox is heading up the President's STEM initiative. And very interestingly, again, I think as of a month ago, she had well over 100 companies that were going to work with her on this STEM initiative, trying to get young people interested in the fields at a far earlier age -- particularly women, who do not go into those fields with the level of frequency that men do -- and to think very creatively about how we could have a more robust STEM education in the country. Because part of the challenge with the immigration demand is simply that we don't have enough people here that are going into those fields. And so those are all very key priorities of the administration.

And I'd love to put CeeCee in touch with you to talk about the research.

MS. STERN: Thank you so much.

MR. THORNTON: The gentleman in the back here?

SPEAKER: Ms. Jarrett, I genuinely appreciate the candor of your answers.

MS. JARRETT: Thank you.

SPEAKER: And I have a question that comes from someone -- I have a biracial background group in the working class exposure to the middle class, and I feel desperately that there is the need for a financial literacy initiative that's targeted at people, the 30 to 50 range, 30-year-old to 50-year-old range, and also targeted especially to people of my generation. And the reason is that -- in the previous, for example, Ms. Fudge talked about the importance of a cut-and-invest idea that was applied directly to people at a very local level, but the nuts and bolts of what constitutes valuable investing for people isn't as clear anymore. Like I think about people who invest themselves with Phoenix online programs, those educational programs, those degrees don't work. And then similarly, the people who could maybe use a polytechnical degree, but they don't really know which ones are good for them. And then you have -- just look at the widespread consumer debt and that seems to indicate that people aren't necessarily sure what is the best thing that would help them grow in different ways, skill-wise, et cetera. So -- and I'd imagine this to be fairly cheap relative to maybe a few planes and jets and whatnot. So is there space somewhere, genuinely, for a financial literacy initiative for these people?

And I just want to sort of bracket something in, that one of the most interesting programs that I've seen used -- the New American Foundation does some work with this; I'm not with them, but I'm just mentioning that -- is with child savings accounts, which are so extremely successful in teaching people very important things. And as someone coming from a working class background, my mother is not that comfortable using the banking system, but my sister in middle school is now learning a bit about Social Security and why it functions. And the reason I wanted to bring this up is because ultimately it seems that if people had a rational understanding as to what cut-and-invest meant to them on that local level, what they did for themselves, then a campaign that talked about Social Security reform and pension reform would make more sense on a national level.

In rallying with Harry Reid's campaign in Las Vegas and doing some work with them -- I know this is a bit long and I'll try and cut it short right now (Laughter) -- I couldn't help but feel the antipathy of the Tea Partiers, just other Americans feeling very anxious, in that they could not quite understand what the President's agenda was for them because they themselves were not experiencing good investments. No matter what the senator did after passing so much legislation, they just couldn't feel it. So is there space at the local level to hire these folks? Just get them out there, a nice big, bold, nonprofit or something like that to let people know how to spend their money so that they can help themselves and their families grow financially.

MS. JARRETT: A very, very good question. And maybe two months ago, the President appointed a financial literacy council that's chaired by somebody I've actually known longer than Arne Duncan, John Rogers. John is the -- I see, you nodding there -- he's chairman of Aerial Capital Management in Chicago, headquartered in Chicago. And when he was, I think, like 9 or 10, his father gave him the ability to choose some stocks, and so from a very early age he became financially literate. And he did studies and research and he really became very invested in it and now he has this huge company and he picks stocks for a living for other people. And so the President asked him to chair this council. And it's staffed by the Treasury Department and the goal is to do just what you're saying: to look at all of the different ways that we can improve financial stability, including teaching financial literacy to all ages.

You make a very interesting point about the 30- to 50-year-olds. John is really interested in looking at it from a very, very young age because he thinks if you teach kids when they're very young to be financially literate, it will stay with them throughout the course of their life. If you would like to hear more about that, John is recruiting corporate leaders right now who he wants to engage with him on this, so that it has a real business representation at the same time as it has a grass roots component that he's interested in as well. He's started a small school that's funded by his corporation in a very poor community on the south side of Chicago, about four blocks from where John and I grew up. And one of the principles of that school is to teach children at a very, very early age financial literacy.

And so it's a priority of the President and it's certainly a lifelong priority and passion of John's. And we would love anyone who is interested in getting involved in that to do so.

MR. THORNTON: Ann?

MS. FUDGE: Question about tax reform?

MS. JARRETT: Uh-huh.

MS. FUDGE: Conversation came up, particularly with my panel, could you give us some incite as to how the administration is potentially pursuing that?

MS. JARRETT: Sure, absolutely. Tax reform is an issue that is -- we travel around the business community. Over the last couple of years we've heard a great deal of appetite for -- the President's position is that he'd like to have a simpler tax code, and basic principles of broadening the bases in the corporate world and lowering the rate are very good principles. You know, also, that there's a challenge of doing that given the fiscal -- the deficit challenges that we have.

It came in a meeting that the President -- it has come up recurrent -- in a recurrent way, but it came up and we had a good conversation about it at a meeting the President had with a group of CEOs at the end of last year, and he committed to them then that he really wanted to take a look at whether there are some steps that we could take, in a comprehensive way, to look at our tax code. And so this Friday is a follow-up to that meeting.

Tim Geithner has invited the chief financial officers from a group of companies to come in and really talk about what the challenges of the corporate structure are. And you're going to find disagreements within the business community because a loophole for you is a real benefit for somebody else, and so figuring out is there a way that we can level the playing field and enable our U.S. companies to compete in a global marketplace because we don't want our tax system to be a disincentive. And right now there are, you know, real advantages to it for some and real disadvantages for others. Folks have suggested this concept of the repatriation of dollars and I think that the thought is rather than doing one-offs, let's really look at a way of comprehensively looking at it.

Every time this has been done in the past, it's taken a couple of years, if not more, to get it done. So we're beginning that process now and it certainly is a priority of the administration. It's going to take some time and it's going to be complicated and it has to be an inclusive process and it has to also be mindful of the deficit challenges, but it's certainly one the President's committed to getting under way. And it will begin this Friday with Tim.

MR. THORNTON: The gentleman back over here? Would you identify yourself, also, please?

MR. LAWSON: Just returning to the subject of the deficit. It's Eric Lawson from *The Hill* newspaper.

House Republicans are talking about bringing 2011 spending back to 2008 levels. What's the administration's position on that? Is that too soon to bring spending down? Would that harm the recovery? Because you talked about not hurting the levers that you need to foster growth.

MS. JARRETT: Well, you're identifying the challenge. I think that what we don't want to do is simplify the challenge. It's a huge challenge and what we spent a great deal of money in the Recovery Act to jump start the economy and try to get it going. We've talked about today that there are these real signs of positive hope in the private sector in terms of growth, but we don't want to cut in a way that pushes us back the other way, so I think we are at the beginning of the budget process.

The President will be releasing his budget in the weeks that come and I can certainly say to you what I said a few -- earlier, which is that the Fiscal Commission's report, the components of it are being taken very seriously by the administration, and it's complicated and it's challenging and the President is committed to getting it right. And so I look forward to working with the members of Congress on both sides of the aisle as we face these challenges.

And I think it's important in this respect: The devil is in the details. And so rather than making blanket statements, I think you really have to look at, you know, with each step you take are there going to be unintended consequences? Or are we going to take the steps that will bring the deficit under control and not jeopardize this really good trajectory that we're on in terms of growth.

MR. THORNTON: Sir?

SPEAKER: I've got a very simple question for you. Today everybody has been talking about creating, innovation, and investing in innovation. And the thing is that you cannot create innovation. You can only create innovators. There's an old saying that if you give a man a fish, you feed him for a day. And if you teach him how to fish, you feed him for the rest of his life.

MS. JARRETT: Right.

SPEAKER: So this country brings in a lot of talented people from other countries, you teach them how to fish. You take the fish, you feed yourself for a day, and you send them back to their own countries. I'm glad that you actually brought up the point --

MS. JARRETT: That's an interesting analogy. (Laughter)

SPEAKER: But when I was growing up in India, there was another saying. You give a man a fish, you feed him for a day. You teach him how to fish, you feed him for the rest of his life, but what you should ideally do is you inspire and empower him to discover his own way of fishing. What he comes up with is innovation.

And my question is, can you please take this message to your boss, the President? (Laughter)

MS. JARRETT: Well, I don't have to state it to him because he believes in it. I mean, it's part of what makes our country so great is that we are such innovators. And it's part of why, you know, he supports incentives for research and development so that we can help support.

And you're absolutely right, you know, government has certain limitations. We can provide some financial resources that allow people to unleash their creative genius and that's what we're very interested in doing. So good analogy and I will quote you directly to him.

SPEAKER: Sure. (Laughter)

MS. JARRETT: Mr. James?

MR. JAMES: Ms. Jarrett.

MS. JARRETT: Somebody I've also known practically my whole life. (Laughter)

MR. JAMES: That's true. Again, thank you for being here, Valerie. And one of the things that occurred to me today as I listened is the whole disconnect about education. We talked about supply and demand in education. We talked about how many engineers China is producing versus how many we are producing and the long-term ramifications of that. And, again, as they say, be careful, what you incentivize is what you get.

I know a young lady that went to Northwestern. She has an engineering degree, but she's writing code for the Board of Trade for Automatic Trading because that's where the rewards are in the financial sector -- or law school. And I'm just trying to wonder if there could be any type of incentive, kind of a -- people talked about a call for a new *Sputnik*, to say here are some incentives to go into science and engineering. If you go into science and engineering and go to work for certain industries or sectors for five years that we'll forgive your student loans. Or, again, not necessarily the pay for college things where you get these degrees and you can't use them, but in terms of how to incentivize, how to encourage, and how to try to get our educational supply to meet the demand that we clearly don't have right now.

MS. JARRETT: Well, that's exactly what Ursula's challenge is. And the President is very -- has taken very clear steps to make college generally more affordable and to make community colleges more tied to the marketplace, but to create the real incentive to lure people into these fields. And to quote from I think it was Ellen Koman from DuPont, she said that the reason why she went into engineering was that when she was a young girl, she was looking at, you know, a man on the moon and that that was something that she wanted to do.

And so what is that kind of ah-ha inspiration that we can give our young people? And even if they don't ultimately -- I mean, she's not on the moon, but she's running a pretty terrific company. And so making it exciting again, making it fun again, making it cool. The President always says he wants to make it cool to want to -- to stay in school and to learn and to go into these fields where there really is opportunity because of the demand. And so aligning those interests is something we're really interested in. And I would encourage -- you know, Ursula worked at Xerox her entire life, grew up with the same kind of inspiration, and now she's running this terrific company, so contact her if you're interested in getting involved with her STEM initiative because it really -- it is what inspires us all.

And your comment about the innovation and the emphasis on creativity and making our country reinvent itself over and over again because that's what keeps us strong, we can't just stand still. I think that's the collective energy that we'd like to see moving forward.

MR. THORNTON: Okay. We'll take one or two more questions. The gentleman here?

MR. GOSTEV: Hello, Sergei Gostev, National Academy of Sciences. I have a simple question. If I'm not mistaken, Barak Obama, when he was campaigning for the presidency, he had a quite different position on these free trade agreements. He was for renegotiating them. And I looked it up on the Internet and the (inaudible) database and I found out that South Koreans had a lot of motives to change President Obama's position on this agreement. So my question is, do you think that President Obama's position was changed to this educational campaign by South Koreans? Thank you.

MS. JARRETT: You know, I've heard that before, but I've never really heard anybody say that the President was persuaded by lobbyists, so it's an interesting point to make, but not true. I think, if you look at the free trade agreement that was agreed to under the prior administration and then you look at the one that the President ultimately is supporting, they are different and they are different in very substantial ways. And the difference is part of why the UAW endorsed this agreement.

The simplest thing would have been for the President to just rubber stamp the prior agreement. It would have been even simple because we'd made some progress for him to sign the agreement as it stood during the time when he was in South Korea. And goodness knows the press gave him a hard time for not reaching agreement in South Korea. And what he said is I think we can do better.

And so he took a couple more weeks and his terrific team -- with Mike Froman and Ron Kirk -- negotiated a better agreement. And so I think the President has been very consistent in his words. What he's interested in doing is taking the steps that are going to create jobs here in the United States, and one important way of doing that is having free trade agreements that are good for our relationship with the other country, create export opportunities, but also are good right here at home.

So I think he was consistent with what he said on the campaign and that's what's included in this agreement and that's what he wants to see with future agreements that he supports.

MR. THORNTON: Okay, one final question. The woman in the far back there?

MS. WRIGHT: Hi. My name is Sterling Wright. I'm the founder of a startup called Global Future Media. It is a content startup focused on technology and innovation. My background is in defense media analysis.

My question is -- a very brief preface, please. Very brief. I've listened very intently to every panel today and they've all been excellent. Everybody has been spot on, and the sense of urgency, the analysis and this sense of urgency is appropriate. About six weeks ago, I attended a defense conference about social media; it also was excellent. And the sense of urgency of what needed to be done in the operational climate of new media was spot on.

However, I'm feeling a bit dismayed about both conferences, not because of their content, but because of their timing. I'm wondering why these conferences weren't hosted in 2003 instead of 2011? And the reason I ask that is because, from my perspective, technology is progressing at an expediential pace. It is turning over every two, three, five years at most. And for all the reasons that we've heard, there are many countries out there far better poised to take advantage of that. We're sitting here discussing these things as if they are new dynamics and we're thinking very linearly about the solutions.

Let's raise a generation of scientists and engineers. It seems to me that by the time we inseminate, incubate, birth, educate, and raise those engineers (Laughter), we will have already lost the game. So I'm just wondering if there isn't room for more radical thinking somewhere. And if so, where you may envision that sort of thinking. Thank you.

MS. JARRETT: Well, obviously, what's terrific about the kind of a group that is assembled here and the way that Brookings can convene is to have that kind of dialogue. And I guess I'd put the question back to you. If you have ways of tackling this that are more innovative, you should come forth with those ideas. Sure, we should have done it 20 years ago, but we're doing it today.

MS. WRIGHT: (inaudible) do that and I will share that information.

MS. JARRETT: Well, and, you know, I'm glad you mentioned startups because even though you didn't ask the question, I want to answer something about startups because it came up again at this meeting we had at the end of the year. And that is what can we do to further incentivize not just startups, but companies who are startups to then take their companies to scale? And are there some steps that we need to take in the regulatory arena to make it easier for companies to start up, but yet not jeopardize the very important rules of the road that are in place to protect investors?

And so if people have ideas of how we can help startups grow, that's something else that we're very, very committed to doing.

MR. THORNTON: Okay. I'm going to bring this to a close. Is there anything else you want to say before you close?

MS. JARRETT: Well, I close the way I opened, which is to say thank you. I mean, the fact that you've devoted this kind of time today -- and for those of you who are engaged in this on a regular basis, we need your enthusiasm, we need your ideas, we need your suggestions, as John said. We also need you to tell us what we're not doing correctly. And this has been an extraordinarily challenging two years and I think the country will be extremely strong again in the future. And it's going to be strong because we're lucky to have such a vibrant and committed and engaged business and academic and think tank communities. So I just want to thank you and tell how much I have enjoyed being here.

(Applause)

MR. THORNTON: So I'm going to close by thanking all of you for coming today. Thanking the panelists in particular, the scholars who put in all of the intellectual content, my co-hosts, Ann; Glenn; Dominic; Steve Denning, who's not here; and Klaus Kleinfeld hidden in the back there. And I particularly want to thank you, Glenn, for putting your shoulder to the wheel and getting this really moving in the way that you have.

Brookings tries to create environments in which civilized conversation goes on and good ideas are discussed in serious ways, and that we certainly achieved that today.

I do think it's pretty clear that -- I think both the diagnosis and, frankly, the solutions are fairly clear. We have an execution problem here. But the truth is that's not going to get fixed by any one president or any one senator or any one congressman. If the people in this room don't actually take it upon themselves to solve the problem, it's not going to get solved. And Ann, very correctly I think, you were musing earlier about do we really have to get to the cliff in order to solve a problem? And can't we kind of break that habit?

And so, I simply leave with a plea and an encouragement that all of you really redouble your own efforts to try to get our country back to where it used to be. We will continue this initiative. We're going to take everything that went on today and go back and regroup and decide what's the next step in this. But I think we made good progress in each one of these and we thank you all.

And, Valerie, I want to particularly thank you for coming and also for your service to the nation and for all your help.

MS. JARRETT: My pleasure, my honor. Thank you.

MR. THORNTON: Thank you.

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