

Keynote

"Innovation 25" Long-Term Strategic Guidelines and The Future of Japan and the World



Speaker

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Summary



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I will explain the main message of the Innovation 25 long-term strategy and its key concepts. Innovation has become a buzzword lately, and we often hear the term "Innovation" being used. This is because innovative capacity is often used as a proxy or the leading indicator of the competitiveness of a nation.

Many countries throughout the world have promoted innovation as one of the top priority policies of national strategy. Some such examples are "Innovate America," announced in 2004 in the U.S., and the Lisbon Strategy, originally developed in 1992 and renewed in 2000 by the EU and by the subsequent Aho report in 2006.

Japan is no exception, as innovation has become one of the pillars of national policy these past several years. Prime Minister Abe initiated the Innovation 25 Strategy Council last year. Minister Sanae Takaichi was appointed specifically for the promotion of innovation, together with Vice Minister Katsuei Hirasawa. I was appointed as a Chair of the Innovation 25 Strategy Council.

There is no question that people are increasingly interested in innovation throughout the world. As a matter of fact, the magazine, Science, carried an article entitled "Innovation Mantra," based on an interview that they did with me. Whether people call it a "mantra" or not, innovation does not happen automatically, nor does it provide a panacea for the issues we face at present. My first message today is that we have to work at it.



What is unique about Innovation 25?

- a long-term plan extending to the year 2025, and not a one-shot deal
- a broad-based approach applicable to Japan's entire social system, beyond S & T, existing ministries & mfg
- a clearly identified international leadership role for Japan
- an initiative to re-brand Japan in an interdependent world, sharing a common destiny, ie, sustainability

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Innovation 25 should be perceived and positioned in this context. Compared with previous policies, the Innovation 25 strategy is unique in the following aspects:

- It is a long-term plan extending to the year 2025, and not a "one-shot deal." It is different from other policies based on the yearly budget. Traditional policies such as the Science and Technology Basic Plan were an approach to promote economic development by investing heavily in science and technology. However, new knowledge and discoveries thus generated need to be translated in the form of new products and services

if they are to provide social benefit. This process of translating new knowledge into the specific form of products and services takes time, well beyond an annual plan. In addition, just one innovative product or service does not provide social benefits to the people if it is not followed by a series of innovations. Innovation 25 is an attempt at building an innovative society through a series of innovations.

- Innovation 25 is a broad-based approach to be applied to Japan's entire social system. It goes beyond science and technology and covers many aspects of society. It includes the reform of existing regulations and eliminates impediments that interrupt the transformation of new knowledge into social values.
- It has a global perspective and indicates clearly the role of Japan in the international community. In other words, Innovation 25 is an attempt to re-brand Japan, the second largest economy in the world, within an interdependent global society. As such, it intends to clarify the role of Japan in sharing a common destiny with other nations by helping to resolve global issues.



Key Concepts of Innovation 25

- People with ambitious and challenging goals
- An 'ecosystem' with free interaction of ideas, funds and people across national borders
- Global perspective
- Demand-driven mechanisms for innovation
- Commitment to new mind-set and attitude

=> INNOVATION and STABILITY do NOT go together

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The key concepts underpinning Innovation 25 include the following:

- Emphasis placed on people with ambitious and challenging goals
 - » Innovation will not happen without people

dedicated to overcoming almost insurmountable challenges, and thus the most important concept of Innovation 25 is people.

» Innovation 25 is a strategy extending to 2025, almost 20 years from now. In order to figure out the world in 20 years, let us remind ourselves what we had, and did not have, 20 years ago. Two decades ago, we did not have e-mail or cell phones, which we now take for granted and use everyday. Even 10 years ago, they were not used as extensively as today. What kind of society and world will we have 20 years from now? In 20 years, those who are born today will be 20 years of age, and those who are now 20 years old will be 40. What kind of society and world can we imagine in 20 years? Two decades is a long time, and it is clearly beyond our imagination. Even the strongest and the wisest today may not be the strongest or the wisest in 20 years. As Darwin clearly stipulated, only those who can adapt to the changes in the environment can survive in the global era over two decades. Thus, the capability to change and adapt as the environment changes becomes indispensable.

» Those who believe in their own capability to change and make change happen in the face of new challenges are the only ones who can innovate continuously. Those who say "I cannot," and give a long list of excuses, will never innovate. In other words, those who can develop a totally new perspective and who can think completely free of past experiences and customs are the key to promoting innovation. As I often call them, the mavericks, "the nails who stick out," or those who can think "out-of-the-box," are crucial for innovation. The need for identifying and developing these people is clear, as the phrase "to develop those nails who stick out" is mentioned four times in the final report of Innovation 25 which was approved by the Cabinet.

- An ecosystem in which resources required for innovation, such as new ideas, new discoveries, and

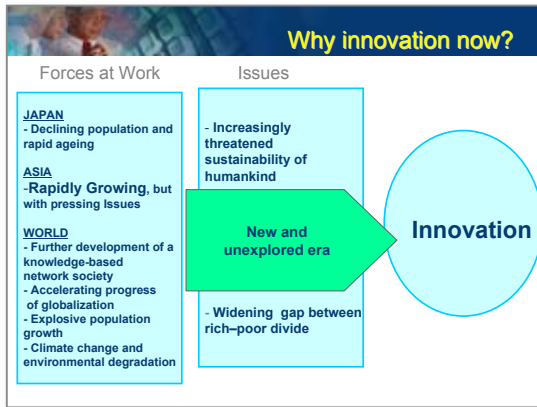
technologies, are combined in a creative way and delivered quickly to the society that needs to be built

- A global perspective that goes beyond national boundaries in order to identify the trends that are developing in the world
- A strategy that focuses on demand-driven mechanisms for innovation

Innovation 25 promotes not only traditional supply-side innovation, but also demand-driven mechanisms for innovation. In demand-driven innovation, how to respond to the diverse needs of customers will become the key. Some innovative examples originating from Japan, such as DS and Wii, which were developed by Nintendo, are epoch-making in that people's needs, many of which they themselves are not even aware of, are explored and met. In that sense, they are fine examples of demand-based innovation. No wonder Nintendo is now ranked in the Top 10 in terms of market capitalization in Japan. Their success is due to their highly innovative approach to uncovering latent market demand.

- A new mind-set and attitudes

Innovation will not happen unless we are prepared for, and dedicated to, a new mind-set and attitudes, which set innovators apart from conventional ways, traditions, and legacies. Change is the key. Innovation is not for those who cannot change or are afraid of change. Innovation and stability do not go together.



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Let us consider why innovation is such a hot topic in many countries. Japan is faced with a declining and rapidly aging population. The rest of Asia, on the other hand, is growing rapidly, and as a result, is plagued with some pressing issues, such as energy and the environment. These issues require immediate attention so that solutions can be developed in the near future.

When I visit other Asian countries, I am always overwhelmed by the accelerating speed of growth, the magnitude of change, and the vitality of the youth.

When we turn our eyes to the world at large, knowledge-based network societies are progressing, as people, regardless of the physical location, become even more connected, thanks to the progress of ICT. Globalization is progressing further, driven by these trends, and we will never go back to "the good old days."

On the global level, population growth is exploding; the world population reached 6.6 billion, according to a recent report. The population is expected to grow even further to reach 8 billion in 2025 and 9 billion in 2050. As population growth explodes, climate change and environmental degradation are increasing, with their negative impact. At the global level, therefore, the sustainability of humankind is being increasingly threatened. The gap between rich and poor countries, often called the "North-South problem," is widening. What is even more noteworthy is that people throughout the world have become aware and concerned about this rich-poor

divide.

After the G8 summit held in Germany at the beginning of June, a meeting by the Science Advisors of the G8 countries was held in Slovenia. I heard that Prime Minister Shinzo Abe's initiative to encourage an agreement on CO2 targets was very much appreciated at the G8 summit. Prime Minister Angela Merkel's proposal to reduce CO2 levels by 20% in 20 years was not able to win the support of all, as President George W. Bush did not agree. However, after the coffee break, Prime Minister Abe's proposal to shoot for a "50% reduction in 2050" triggered a swift move towards the final agreement among the heads of the G8 summit states. It is extremely important to have a shared understanding and a common view among the heads of state, such as at the G8 summit, when addressing issues such as global warming.

Innovation is one of the few means to resolve the kinds of global issues that we face today. There has been an increasing understanding throughout the world that innovation will be the only effective means to realize both sustainability and economic growth. This is the reason why many nations are now competing in developing and implementing innovation policies.



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While the economies of many nations in the world have made tremendous progress, we are now faced with new limitations. We are under some new constraints.

These constraints include climate change, environmental deterioration, and various types of pollution, as well as resource constraints in water, food, and other natural resources. Recently, the general public has become aware of the North-South disparity and its widening gap. This perception has brought about a sense of inequity, frustration, terrorism, and violence, together with the increasing importance of racial identity.

As the world population is exploding to reach 9 billion in 2050 from 6 billion in 2000, we are faced with the fundamental question, "Is our society sustainable?"



Why innovation for Japan?

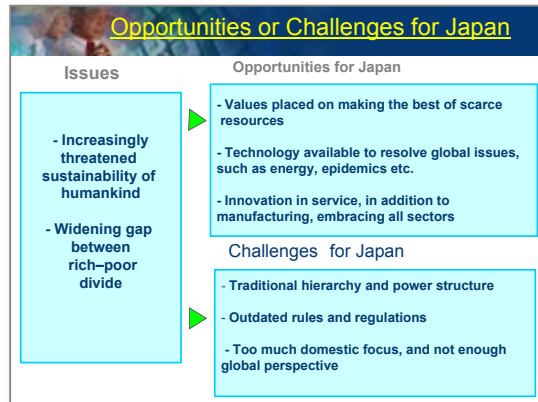
- Innovation is the only means to:
 - resolve existing constraints
 - continue growth
 - survive a declining population
- Innovation will sustain economic growth through:
 - improving productivity
 - improving dynamic productivity through continuous changes
- Many countries already implementing national initiatives

=> Innovation 25

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Let us now turn to the question of why innovation is important for Japan today. How do we respond to the increasingly recognized role of innovation as an engine for international competitiveness and economic growth in the world? How do we sustain economic growth in the face of the declining population and rapidly aging society of Japan, within the larger constraints of the world's problems? These issues cannot be resolved without innovation, as it is the only means of unshackling existing constraints, maintaining continued growth, and surviving a declining population. Other countries have also initiated processes to establish national innovation systems and have already begun implementing broad-based national initiatives. Innovation 25 is to be perceived within this context, as another similar approach.



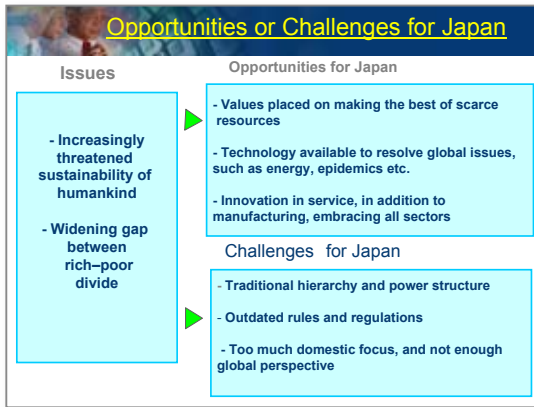
Opportunities or Challenges for Japan

Issues	Opportunities for Japan
<ul style="list-style-type: none"> - Increasingly threatened sustainability of humankind - Widening gap between rich-poor divide 	<ul style="list-style-type: none"> - Values placed on making the best of scarce resources - Technology available to resolve global issues, such as energy, epidemics etc. - Innovation in service, in addition to manufacturing, embracing all sectors
	<p>Challenges for Japan</p> <ul style="list-style-type: none"> - Traditional hierarchy and power structure - Outdated rules and regulations - Too much domestic focus, and not enough global perspective

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What implications then do these global issues have for Japan? I want to encourage the approach of capitalizing on Japan's strengths and to further promote them in resolving these issues. Let me take some specific examples. Since the oil shock in 1973, Japan's economy has continued growing. As many strenuous efforts have been made on the production floor to reduce CO2 emissions, we have been able to achieve excellent CO2 emission efficiency results that are twice as good as those of the U.S. and ten times better than China. The absolute level of CO2 has increased as economic growth has continued, and traffic, for example, has increased. And yet, the emission levels of CO2 on the production floor have not increased. In other words, energy efficiency in Japan is at a top level. Thus, Japan can make a tremendous contribution to the world when we transfer these highly developed technologies to other countries. As Mr. Sadayuki Sakakibara of Keidanren pointed out, Japan is also very advanced in terms of water management, as we dominate the world market. Fifty percent of solar panels are manufactured by Japanese technologies. In fact, Japan is so advanced in these fields that I want to emphasize that we should move very quickly to transfer these technologies to places of need throughout the world.



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Now let me turn to the three policy initiatives of Innovation 25:

- The first initiative is to capitalize on the advanced technologies of Japan to initiate the resolution of energy and environmental issues of global significance. We propose to use global energy and environmental issues as a driver for economic growth, as well as an international contribution and foreign policy. Japan has the necessary advanced technologies to help resolve these immediate issues. Specifically, clean energy and green technologies, as well as other leading technologies in water and food management, are the best candidates. We will serve as a hub not only for continued economic growth, but also for leaving a "good earth" for the next generation.
- The second pillar involves investment in the next generation. We propose to double our investment in the young generation so that they will have many more opportunities for international interactions. Whether they go overseas, or young people from other countries come to Japan, it will be a great opportunity for Japanese youth to be exposed to diverse cultures and value systems.
- The third initiative is the new role of, as well as the reform of, the university system. Competition among the leading universities of the world has become intense, and many other countries are taking aggressive actions and making drastic reforms to attract the best,

brightest, and most motivated students throughout the world. We have a language issue, but we need to recognize the fact that English, whether it is broken or not, has become a defact standard and the common language in the world, and the fact is that 80% of what is available on the internet is in English. Unless we more effectively incorporate English into our educational system, the value and benefits of the knowledge and information made available through advanced ICT will not be accessible to the Japanese. There is no way that we can regain and maintain competitiveness without English. If we continue to have an "allergy" against English and avoid English, the gap between Japan and the rest of the world will widen even further. As we have a sense of urgency about this point, Innovation 25 has some specific policies to reform university systems. For example, a policy stating that there should be no distinction between natural and social sciences at admission time into universities is clearly stated as one of the items approved by the Cabinet.



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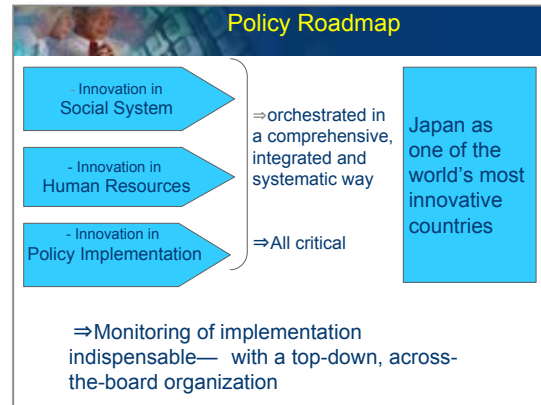
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Investment in science and technology is important. In particular, we are encouraging frontier, cutting-edge, and unique (i.e., different from others) research. Regulatory reform that eliminates obstacles and encourages this ambitious approach is critical to deliver real value.

Not only in manufacturing, where Japan is known as a world leader, but also innovation in the service sector should be encouraged. In order to promote innovation in the service sector, we have to have a comprehensive review of regulations, norms, and rules to identify obstacles to service innovation. By asking for the help and cooperation of existing committees such as the Regulatory Reform Committee and the Economic and Fiscal Policy Committee, we will implement necessary reforms. Constant review to monitor the progress and direction of our efforts will be conducted in the future.

So far, Japanese strengths have been based on supply-side innovation, where products of high quality are produced on the assembly line. The most important strength of the Japanese lies in the manufacturing of hardware. This strength will play a significant role in the Asian market, for example, as the potential is huge for these types of products. In addition, we will promote demand-driven innovation. One effective tool to market demand-driven innovation is the use of branding. In China, for instance, where the economy is growing so rapidly, the top-selling liquor is Chivas Regal. The tremendous success of Chivas Regal is due to the power of branding. This example shows that we need not only good products but also the ability to brand them effectively to meet diverse customer needs.

We want to bring about this transformation from a linear-innovation model to a demand-driven innovation model. In the former, the new knowledge discovered in science and technology is translated into new products and services along a linear approach. In the latter, we start innovation with the demands of the marketplace.



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Let me now talk now about our roadmap. Innovation, as is promoted in Innovation 25, consists of three types: (1) innovation in the social system and social infrastructure, (2) innovation in human capital, where mavericks and those who can think "out-of-the-box" are developed, and (3) innovation in policy implementation, based on the facts and not on precedents. Not only Japan, but also the world as a whole, is the arena where the innovation game is played and issues are resolved.

In order to make Japan one of the most innovative countries in the year 2025, these three types of innovation need to be orchestrated in a comprehensive, integrated, and systematic way. With any one of them missing, policies will not work, as all three are critical components of the total package. Thus, monitoring the implementation of the policy roadmap and checking the progress against the target goal are indispensable. Policies that are top-down, across-the-board, and go beyond existing ministries, are crucial. It will be a tough uphill battle to make this happen, but it is needed now for Japan.

Technological Revolution and Techno-Economic Paradigm

- First: Industrial Revolution, UK, 1771-1830
- Second: Age of Steam and Railway, UK, 1829-1873
- Third: Age of Steel, Electricity, and Heavy Engineering, US and Germany to Euro, 1875-1918
- Fourth: Age of Oil, Automobiles and Mass Production, US to Euro, 1908-1974
- Fifth: Age of Information and Telecommunication, US to Euro and Asia, 1971-20??
- Sixth: Biotech, Nanotechnology? But, CONSTRAINTS!!= sustainability

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You may wonder what brought these changes and what factors have played a significant role in the environment surrounding Japan. Let me step back to give a historical perspective by combining technology and the economic/social structure. We have undergone several paradigm shifts since the time of the Industrial Revolution. When we reflect back on history from a global perspective with the focus on new technology, we note that both society and the paradigm change drastically after about 50 years from the initial emergence of a new technology. After about 50 years, the new technology emerges, penetrates, and matures to bring about changes in society, leading to the new paradigm.

The first wave came in the United Kingdom in the form of the Industrial Revolution. It covers the period from 1769 to 1830, taking some 50 years for new technologies to peak and saturate the markets. The second wave, which also originated in the UK and was transferred to the U.S., covered the period from 1829 to 1873. This was the era of the steam engine and railways. The third wave extended from 1875 to 1918 and was called the age of steel, electricity, and heavy engineering. It originated in the U.S. and Germany, then moved to other parts of Europe. Around 1920, the technology matured and the world underwent a drastic paradigm shift. The fourth wave is characterized by mass production of standard products and consumption, well represented by the auto industry, with its typical energy source of oil. This is when the Model-T

was introduced by Ford. Car ownership spread rapidly, due in part to the low price of gasoline. This wave originated in the U.S. and moved to Europe and then to Japan. It began in 1908 and lasted until 1974, when it peaked and matured, partially triggered by the oil shock in 1974. The fifth wave is underway now and is often called the age of Information and Telecommunications, which began in 1971 when Intel launched the MPU (Micro-Processing Unit). It originated in the U.S., and was transferred to Europe and Asia. It is still in progress and has not yet peaked.

Let us take the example of e-mail. The internet has been around since the 1980s as a technology that was available to universities and research institutions. Its wide use and applications were limited, and few ordinary people were able to use them. New technology does not produce social benefits unless a majority of the people can access and use them. What triggered the widespread use of the internet was the development of the World Wide Web by Tim Bernard Lee in 1991. Around that time, desktop and laptop personal computers were commonly used but software available was limited to operation systems such as MS Dos and application software such as word processing. No software was widely available for the internet.

What followed in the World Wide Web in 1991 was Mosaic, a browser developed in 1993. Netscape's action of distributing Mosaic free of charge in 1994 triggered proliferation of software for internet and many more new entries into the market, such as Yahoo, etc. resulted. Bill Gates of Microsoft, who was surprised and shocked at the unprecedented diffusion of web and explosive use of internet, launched Windows 95 in 1995. Various new business model innovations such as Amazon.com (founded in 1994, entry in July 1995) and eBay (founded as AuctionWeb in September, 1995, and changed name to eBay in 1997) have emerged since then.

At about the same time, the internet became available to people in Japan. However, it did not initially become popular as telecommunications costs were based on measured rate, making "being on-line" prohibitively

expensive in Japan. Japan had to wait until the year 2001 when the IT Basic Law was inaugurated by Minister Taichi Sakaiya and regulations were reformed to open access to the internet. It became possible to go online at the cost of some 3,000 yen a month, using the Yahoo BB, for example. This regulatory reform triggered a wave of internet use among the Japanese, thus making e-mail an everyday tool. When the new technology became accessible to ordinary people, their behavior was modified drastically.

What this example shows is that innovation "makes or breaks," depending on how quickly we can change existing regulations based on vested interests. Innovation does not depend solely on technology and ideas. Without the regulatory reform that corresponds with the times, even the newest technologies cannot become diffused throughout society. As a result, they do not create new value.

The cell phone is an example in a similar category. Sixty-five percent of the component parts of cell phones are Japanese made, which indicates the strength of Japanese manufacturing. And yet, in the world market for handsets, Nokia is No. 1, followed by Motorola and Samsung. Fourteen Japanese manufacturers make handsets today, yet none of them are ranked in the top three. This is because the Japanese manufacturers focus their efforts on the domestic market and try to accommodate Japanese regulations. They do not see the world market. It is thus critical that we are aware of the strengths and weaknesses of Japan, based on the facts and not illusion. We must also focus on the world and not just on the domestic market.

Age of Information and Telecommunication
1971-20??

- Information-intensity (microelectronics-based ICT)
- Decentralized and integration / network structures
- Knowledge at capital / intangible value added
- Heterogeneity, diversity, adaptability
- Segmentation of markets / proliferation of niches/ brands
- Economies of scope and specialization combined with scale
- Globalization/ interaction between the global and the local
- Inward and outward cooperation clusters
- Instant contact and actions/ instant global communications

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Let us return to the historical development of paradigm shifts. We are now in the fifth age, that of Information and Telecommunications. This age is characterized by information-intensity, the co-existence of decentralized and integrated/network structures, and knowledge and intangible assets. In this context, diversity and adaptability is "the name of the game." Segmentation of the market has produced a large number of niches, cutting across the globe. Brands play an important role. In this era, globalization and interaction between "the global and the local" becomes the key. Clusters, where collaboration and competition are both significant, are playing an increasingly important role.

Innovation in Globalized World

- Invest on Human Capital
- Nurture Entrepreneurship
- Heterogeneity, Diversity, Adaptability
- Focus on the Strength- Compete
- Recognize the Weakness- Collaborate
- Speed is the Essence of the Game
- Think locally, Act globally

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Innovation in a globalized world has a very different set of requirements from the previous era. Investment in human capital, and not just people, is the key. Entrepreneurs, and not just corporations, have to be nurtured. Heterogeneity, diversity, and adaptability need to be identified, explored, and developed. Any region, country, and organization should capitalize on their own strengths as the basis for competition. At the same time, they need to recognize their own weaknesses and collaborate with others to supplement these weaknesses. This is what is called the Global Innovation Ecosystem.

In today's world, speed is the name of the game, as

real-time instantaneity is the rule. "Think locally and act globally" is what is needed today. Thank you.