

I am deeply pleased and honored to receive this prestigious award. I sincerely thank His Highness Sheikh Mohammed Bin Rashid Al Maktoum for his generosity from the bottom of my heart. Also, I'd like to express my sincere thanks to all the people who make this happen.

Figure 1 please.

Now we are living a very special era in human history. This figure shows this fact clearly. Please note that the horizontal axis shows a thousand years.

Human activities have continuously been growing, but very slowly in the history. However, in the 20th century, human activities began to expand dramatically and rapidly.

The atmospheric CO<sub>2</sub> concentration soared. The global average per capita GDP has increased seven times. What surprised me is the average life expectancy.

It was 31 years at 1900. It was short. But now 72 years. Because the average life expectancy is presumed to be 25 years in the Greek or Arabian days, only 6 years grew in thousands of years. But, 41 years increased since the 20th century.

The driving force of this abrupt change is the improvement of productivity by the Industrial Revolution. Thanks to the industrial revolution, humans became affluent, able to enjoy longevity, and at last began to change our planet the earth.

This fact is the basic reason for concern about the sustainability of human civilization. Can we solve the trilemma of affluence, environment and human happiness on our finite earth? This is the very fundamental question of today.

I am confident we can do it. So, I wish to share with you the

essence of my vision 2050 and a platinum society. In the 15 minutes allowed for my short speech it's a very difficult task, but I will do my best.

One of the important concepts of my vision is saturation. Sooner or later, the population of the world will be saturated on the finite earth. But how many will be the maximum population and when will it occur? That is important.

According to the latest demographic research, the world population, which is 7.3 billion now will continue to grow for a while, but it will peak at 9.6 billion around the end of this century. The world population will not explode but peak.

Even now, in about half of the world, the birthrate is smaller than the birthrate that maintains the current population. Given that the fertility of the world has continuously been declining, saturation of population at a reasonable level within this century is very convincing.

Manmade objects will also be saturated. For example, the number of cars owned is saturated when there is one car for every two people. This saturation of artifacts is not hypothetical, but the reality in most developed countries.

How many new cars are sold every year. Saturated! The answer is straightforward. In Japan, 60 million cars are running now. This number has been nearly constant in the last 20 years. The average life expectancy of the car is 12 years. 60 divided by 12 is equal to 5.

5 million cars are scrapped each year. The same number of new cars are sold and the total number of 60 million is kept constant. This is what is going on in developed countries. Cars are saturated there.

What is the fortune of the scrapped cars? They are not thrown away but they are recycled. Iron is melted and used for making new steel. This is the cycle of cars. And it is the same for buildings, bridges, refrigerators, televisions and all artifacts. The accumulation of the artifacts, therefore, is called urban mines.

Importantly, the iron once manufactured from iron ore goes through the society permanently. This means, under saturation, the steel we need to make new artifacts is equal to the steel scrapped. This also means that under saturation we do not need iron ore anymore. The urban mines will replace natural mines.

This story holds true for other metals as well. Please be cautious in investing.

Could you show Figure 2?

Next key question for considering sustainability of human civilization is when saturation will occur worldwide.

This red line shows total amount of iron existing in Japan. The blue line shows annual increase. Before 1950, very small number of cars and buildings existed in Japan. During the high economic growth period of sixties, seventies and eighties, many artifacts were accumulated. Surely now, saturation of iron has occurred in Japan.

The total amount of iron is 1.4 billion tons. This is the reserves of Japanese urban mines. This amount corresponds to 11 tons per person. It is reasonable to assume this value, 11 tons per person is the measure of saturation of iron.

Now in China, 9 tons per person of iron already exists in Chinese urban mines. If going on as it is, within 5 years, it will exceed 11 tons per person, the saturation value and iron will be saturated in China. Soon it will come.

How about the world? Now 4 tons per person. I presume in 2050 world saturation of iron will come. Because iron saturation means saturation of the basic infrastructure, it will change our civilization from the ground, including society, industry and jobs.

This is the reason why I think that the year 2050 will be the crossroads of human civilization and why I drew Vision 2050, instead of 2010 or 2070.

Next question. Which is better, iron scrap or iron ore as a raw material for making steel?

Iron ore exists in the form of iron oxide due to the presence of oxygen in the atmosphere. On the other hand, iron scrap is iron itself chemically. Then, which is more energy efficient, removing oxygen from iron oxide or melting iron scrap, for making steel?

The answer is obtained from theoretical reasoning and factory survey. Melting requires energy 27 times less than that of removing oxygen. One-twenty-seventh is the theoretical value derived from the law of thermodynamics. The actual value in the real factories is one third.

Theory predicts the superiority of the scrap over the ore qualitatively and furthermore the quantitative gap between one-twenty-seventh and one third indicates the possibility of energy saving by improvement of technology. So, the world of recycling will be a highly energy efficient society.

Also, without doubt recycling of aged artifacts is much more comfortable for people than digging rocks from underground.

In conclusion, it is possible to build a better society based upon urban mines with keeping the earth more clean and beautiful and making people happier.

If I wish to tell the whole outline of Vision 2050 and Platinum Society by talking about global warming, energy, water, food, nature, forests, and in particular, human and society, my talk would last for days. So now, let's rush a conclusion.

The vision that I talked today is new knowledge, isn't it? I believe it is. But, most of the pieces of knowledge which compose my vision are not new. They are existing knowledge. What I did is to mobilize the right pieces of knowledge from the ocean of knowledge for building a vision for sustainability.

Figure 1 again, please

Over the last hundred years, atmospheric CO<sub>2</sub> increased 1.5 times, the average life expectancy tripled, and the per capita GDP 7 times. These are huge increases. But knowledge has increased by far the more. It can be 1 million times or even 1 billion times.

Increase of knowledge is a good thing as a matter of course. However, it was so much that nobody could grasp the whole picture.

We do not have any means to properly use the excess knowledge. If we use the right knowledge for the right purpose, we can solve most of the challenges we face now. I define this process as structuring knowledge.

The target of this award is production and dissemination of knowledge. This is very correct and timely because it is the era of knowledge explosion. I believe that the bridge between production and dissemination is structuring, and I hope that what I did and you commend is structuring.

Thank you very much again for the award.