Director General of Meti, Mr. Hiroshi Asahi.
Dignitaries.
Ladies and gentlemen,

I´am truly honoured to address this distinguished audience of the Japan-Iceland Geothermal Forum 2010.

This is my first visit to Japan. I have a suspicion it will not be my last.

In Iceland, we have known for a long time that there is a lot to be learned from Japan. Your technological prowess has of course been the envy of other countries. That is why in Iceland, we have for 30 years purchased all the heavy equipment and turbines for our geothermal plants only from you.

Japan is also a very sophisticated civilization with strong moral values. Your ethics make it very desireable to do business with you, as we have experienced. However, the most remarkable character of your culture, is the high value you place on loyalty, to your family, to your employees, and loyalty to your friends.

In Iceland we have been fortunate enough to be counted among the friends of Japan. I can say, as a Minister of Foreign Affairs in a country that is emerging from the economic recession, that in Iceland we know your loyalty first-hand. When the financial crisis hit us in 2008 and we entered an economic restructuring with the IMF, Japan was the first nation to declare her strong support, and did so throughout.

I want to use this occasion to say formally on behalf of my government and the Icelandic people: Thank you Japan for your friendship. We shall not forget.

Ladies and gentlemen,

We all know, that the Japanese and the Icelandic people are vastly different, not least in size, culture and language, and the distance between our countries is long.
With that in mind, isn't it remarkable then, how many similarities, values and characteristics we nevertheless share as nations?

If you want to live to a sprightly old age, you would be well advised to be born either Japanese or Icelandic. The fact is, that to the envy of the rest of the world our people share the distinction of having the highest life-expectancy of all nations.

No doubt this is related to another common trait in our culture, the fact that our nations are voracious consumers of fresh seafood, stuffed with Omega-3, that not only keeps the brain agile, but the body young and active into very old age.

You, in the course of history, produced the most famous warrior class of all times, the samurayas, whilst we in Iceland are the offspring of some very belligerent people also known for their warring abilities, the famous vikings.

One thing, that fascinates us about Japan is that very early on you started to chronicle your own history, whilst we of course produced the famous Icelandic Sagas, that not only described almost every step in our history since settlement, but also the history of several European nations. Indeed, we sometimes say, in jest, to our much bigger Scandinavian neighbours, that if it wasn't for us they wouldn't have a history.

Probably our similarities can be traced to the fact, that both our nations live on islands.
People of islands are a bit peculiar. They tend to be stubborn, fiercly independent, and they develop a sturdy self-reliance in order to survive. That has helped both the Japanese and the Icelanders to endure some very difficult times in our past.

There is one more important thing that we share, and that is the reason for us being here today.

We are geothermal nations.

For centuries our nations have been accustomed to living dangerously in the shadows of volcanos and earthquakes. Whilst we have learned to respect the elements, we have also learned to harness the power of the erupting earth and turned a potential source of disaster into a great advantage, in the form of geothermal energy.

Today, geothermal is an ingrained part of the Icelandic identity. It colours the life of every citizen. Indeed, in Iceland, renewable energy laid the foundation for a very successful society, with a welfare system that is second to none.
But it wasn´t always like that.

Let me tell you our Cinderella story, of how we rose from rags to riches.

In the early part of the last century, Iceland was amongst the poorest countries in Europe. At the end of the Second World War, Iceland was as dependent on oil and gas to drive its economy as any other western country. For centuries we

thought that our only natural resources were the fishing stocks in the sea, but didn't realize that we had something akin to goldmines under our very feet, or in front of us, in the form of geothermal geysers and the glacial waterfalls.

When we realized the potential in these resources around the middle of the last century, we decided to invest heavily in two things: Research on renewables, and the generation of renewable power and power infrastructure. This totally changed our society.

In the lifetime of only one generation Iceland managed to transform herself from being an oil-dependent economy to being able to meet 80% of our energy needs from green, clean renewables.

Today, virtually all electricity in Iceland is derived from renewables. Geothermal covers more than 90 % of our space heating requirements. Only about 20% of our energy requirements are met by imported oil, to drive our large fishing fleet and for transport.

We haven't done this alone. We have had a good supporting partner, that supplied us with first-class equipment. The geothermal industry in Iceland is in fact a running tribute to the Japanese industry. Almost all of our turbines are made in Japan, designed by Japanese ingenuity, and put together by Japanese craftmanship.

Our cooperation has been going on for well over 30 years and we want it to continue. The age of the geotermal is just beginning.

Three important lessons are to be drawn from the Icelandic experience that might be of use elsewhere:

Firstly, we need to find ways to better use the full potential of geothermal. Yes, we use the geothermal to generate electricity, heat houses and huge swimming pools, for high-class geothermal spas, health clinics for skin diseases, geothermal vegetables and salmon, and even to melt the snow from our pavements. Nevertheless, as yet, we only harness about 7-11% of the full themal energy generated by each field. Geothermal as a resource has to be approached as a multiple stream of revenue.We need innovations to branch out and utilize further the vast amount of energy that goes to waste.

Secondly, it is possible to design geothermal structures and harness geothermal sources with minimal effects on nature. Geothermal areas quite often are located in places of scenic beauty, and understandably, you will always encounter some environmental resistance. Some places you will simply have to leave alone, but

do not forget, that the production cost of geothermal is so low that it is possible to accommodate quite a lot of expenses due to environmental demands, such as going underground with the necessary structures.

Thirdly, you have to protect the source and not be tempted to over-exploitation. In Iceland, we have decades of experience that has tought us how to match utilisation with the capacity of the area, and thus avoiding over-exploiting the resource. That is an art, that only experience and good science can ensure. In some places, such as in the USA, greed and a short-term view led to over-exploitation that gave geothermal a bad name, and frightened capital away. That is totally unessecary.

Earlier in my speech I made a bold statement when I said: The age of the geothermal is just beginning.

Let's explore for a few minutes my arguments for this.

Of course, geothermal will not solve the energy problems in the world. Geothermal will not rid the planet of the damaging emissions that are the price we pay for industrialization. Geothermal is not the silver bullet that will smash the roots of the climatic problems.

Yet, geothermal will play an increasing part in the portfolio of solutions that for a long time will be needed to combat the climatic changes caused by human activities.
There are three reasons for my confidence:

First, we have hardly started to utilize low-temperature areas for generation of clean geothermal energy.
Secondly, there will be new technological advances that will increase enormously the yield of energy from geothermal sources, and I shall in a short while tell you about one.
Thirdly, there still is an array of countries in at least four continents with significant geothermal potential, some even enormous, that is not being used.

Let's explore the first argument: Today, the use of geothermal for generation of of power is based on high-temperature areas. But such areas are comparatively scarce. There is, however, a multitude of places all around the world where you have rich low-temperature sources, either from old and cooling volcanic areas, or in the vicinity of fold mountains, or you simply drill very deep into the earth and encounter water that is being heated by the normal temperature gradient that increases with depth. You can exploit it for all sorts of uses, such as district heating. Big cities like Paris and Amsterdam, even parts of Beijing, are literally

floating on a pool of low-temperature water. In Abu Dhabi Icelandic experts are using old oil-wells to produce low-temperature water that can be used for air-conditioning. In the world, we have tens of thousands of left oil-wells, most of them in countries that use huge amount of energy for air-conditioning.

This of course requires new technological approach, and new innovations, but I'm sure this is one of the future possibilities for the geothermal industry.

My second argument was that new technology would be developed that in some places will revolutionize the yield from existing geothermal areas.

Well, this is being done as we speak. In Iceland we are presently experimenting with a new break-through technique that is based on the so called deep-drilling technique.

The conventional method is to drill holes of 2-3 km depth, extract steam that drive turbines, Japanese of course, to generate electricity. The deep-drilling technique entails going further down, at least 4-5 km, close to the magmatic intrusions. The depth and the intense heat conducted from the magma places the geothermal liquid under extreme pressure, existing in what the physics call supercritical stage. When such water seeps into a borehole it explodes with much greated force, generating a power that is 5-10 times greater than a normal well, perhaps generating up to 25 MW from a single hole. This may, if honed to perfection in terms of drilling and turbine technology, increase the yield from each area 4-6 times.

I believe that the innovative human mind can solve all problems. That is why I also believe that the deep-drilling technique will be a standard, off-the-shelf practice, some time in the future.

My third argument was that we still have quite a few countries with unused potential. Well, I should apologize for having in fact made an understatement. In fact, the number of such countries is upwards of 100. That figure reflects the huge potential still to be harnessed and provides ample proof for the validity of my statement.

Iceland is already active in quite a few of them. Last summer China signed an agreement with Icelandic companies on collaborating on more geothermal district heating systems, having successfully finished the first one, serving 400 thousand people. In China alone, there are 500 possible geothermal sites. Last month the Russian Premier, Putin, sanctioned a big project in Kamtchatka using Icelandic technology. In the audience today we have Icelandic companies that

are involved in Indonesia, the Philippines, some places in Africa, as well as in several countries of Central Europe.

Indonesia has to import energy. Yet, it is placed on a great ring of fire, with unused geothermal potential of 30 thousand MW.
East Africa contains some of the poorest countries on the globe. The biggest single reason for their dire situation is energy-poverty. Yet, it is a host to numerous strong geothermal systems, with a potential of 14 thousand MW.

Do we, the western affluent societies, not have an obligation to break off their bondage, by advancing them our geothermal tecnhology? Yes, we do.

What is remarkable, companies in our two countries can do it by joining forces, joining expertise with finance, on a purely market-based, that will create a win-win situation for everyone: the investors, the people of these countries, the work-force of our own nations, and not least, to Mother Nature.

Don't forget, that geothermal is not a bird in the wood, it is a tested, proven technology. It is the cheapest form of renewable energy available today. It is the cleanest source of energy, apart from hydro, but with much less environmental impact.

I´ll leave you with one final thought. What if the Icelandic deep-drilling technique would be perfected? For East Africa it could mean a potential of 65 thousand MW and for Indonesia of 120 thousand MW if we use the simple formula of four times the energy potential. Not to mention other hot spots such as our own countries. For the energy industry in our countries such a future would open up great possibilities.

Ladies and gentlemen,

I want to thank you for attending this important conference. I want to thank the sponsors and the Japanese government for making it possible.

For 30 years Iceland and Japan have had very good relations, and a very good cooperation within the geothermal field. We should strenghten that cooperation, in Japan, in Iceland, and in third countries. Thank you.