President's address to the Nation on the eve of 59th Independence Day Celebration

ENERGY INDEPENDENCE

"My Dear Citizens of India,

On the eve of the 59th Independence Day, I extend to you my best wishes for your happiness and prosperity. My greetings to all our people at home and abroad. Let us resolve, on this occasion, to remember with gratitude, the selfless and devoted services of our Armed Forces who are guarding our frontiers on the land, over the sea, and in the air. We are also grateful to the Paramilitary and Police Forces for preserving our internal security and maintaining law and order.

I met 137 freedom fighters from 27 States and Union Territories on 9th August 2005 at Rashtrapati Bhavan. I saw their enthusiasm even at their ripe age, to bring back the nationalism as a living movement. Today our country is free, because the freedom fighters gave their best to the nation in their prime of youth. Honouring the freedom fighters is honouring the independent nation and its spirit of nationalism. We must thank them with respect and make their lives happy.

Nature's Fury and its Management

While we are celebrating 59th anniversary of our hard earned political independence, we have to remember the sufferings of our people affected by the recent rain and flood in Maharashtra, Gujarat, Madhya Pradesh, Himachal Pradesh, Karnataka and Orissa. The city of Mumbai and other areas in Maharashtra bore the brunt of nature's fury. The people of these areas are meeting the challenge with courage and fortitude. The Prime Minister had visited some of the affected areas. I spoke to the Chief Minister of Maharashtra while he was visiting various places affected by the floods and I also shared my concern with other Chief Ministers. Maharashtra needs help at this critical juncture to mitigate the sufferings arising out of loss of life and properties inflicted by the fury of rain and flood. All the States need to express their solidarity with the people of Maharashtra in their time of distress and suffering, and collectively help in removing the pain of the people. Mumbai needs an urgent reconstruction to face unexpected heavy rain, as it happened this year.

Rainfall and Floods: Rainfall and floods are annual features in many parts of the country. Instead of thinking on interlinking of rivers only at times of flood and drought, it is time that we implement this programme with a great sense of urgency. We need to make an effort to overcome various hurdles in our way to the implementation of this major project. I feel that it has the promise of freeing the country from the endless cycle of floods and droughts. Also, as a measure for preventing flooding of the streets in the cities due to heavy sustained downpour, I would suggest the Ministry of Urban Development at the Centre and the State governments to mount a programme to rebuild and modernize the infrastructure and storm-water drainage systems including construction of under ground water silos to store the excess water. This water can be treated, processed and used at the time of shortage as practiced in many other countries. Fortunately India has adequate technology and expertise in making underground tunnels for metro rail system. This technology can be used for constructing underground water storage system.

Earthquake Forecasting: Another natural phenomenon that affects and causes damages of high magnitude without pre-warning in many parts of our country is the earthquake. To prevent heavy damage to the people and property, we need to accelerate research for forecasting earthquakes. Research work on earthquake forecasting is being done in many countries. We in India should have an integrated research team consisting of experts drawn from academia, meteorology and Space Departments for creating earthquake forecast modeling using pre-earthquake and post-earthquake data collected from various earthquake occurrences in our country. This can be validated periodically with the proven forecasting data available from other countries.

Earth Systems Science: Many of the countries in the world have experienced successive calamities driven by the nature. Till recently, the researchers world over had been pursuing research in unconnected ways, in Climate, Earthquake, Ocean Sciences and Earth Sciences, without realizing the latent but tight coupling between these areas. This new realization has prompted many countries to pursue the interdisciplinary area of research which is now known as Earth Systems Science. It is in fact fast emerging as an area of convergence between Earth, Climate, Ocean, Environment, Instrumentation and Computer Sciences. I strongly suggest that India should mount a programme in this emerging area of Earth Systems Science. This will call for a dedicated, cohesive and seamless integration between researchers in multiple areas and in multiple organisations. Further, Earth Systems Science doesn't obey political or geographical borders. It is truly a science and its intensive results would make our planet safe and prosperous.

Unlike research in strategic areas, wherein the nations have to maintain superiority over other nations, Earth Systems Science is the ultimate realization of the human kind to collaborate since no nation is safe if its neighbours are not. Nature's fury knows no borders.

Dear citizens, on 26th January 2005, I have discussed with you on the potential for employment generation in eight areas. I am happy that a number of actions are evolving.

Energy Independence

Today on this 59th Independence Day, I would like to discuss with all of you another important area that is "Energy Security" as a transition to total "Energy Independence".

Energy is the lifeline of modern societies. But today, India has 17% of the world's population, and just 0.8% of the world's known oil and natural gas resources. We might expand the use of our coal reserves for some time and that too at a cost and with environmental challenges. The climate of the globe as a whole is changing. Our water resources are also diminishing at a faster rate. As it is said, energy and water demand will soon surely be a defining characteristic of our people's life in the 21st Century.

Energy Security rests on two principles. The first, to use the least amount of energy to provide services and cut down energy losses. The second, to secure access to all sources of energy including coal, oil and gas supplies worldwide, till the end of the fossil fuel era, which is fast approaching. Simultaneously we should access technologies to provide a diverse supply of reliable, affordable and environmentally sustainable energy.

As you all know, our annual requirement of oil is 114 million tonnes. Significant part of this is consumed in the Transportation Sector. We produce only about 25 % of our total requirement. The presently known resources and future exploration of oil and gas may give mixed results. The import cost today of oil and natural gas is over Rs. 120,000 crores. Oil and gas prices are escalating; the barrel cost of oil has doubled within a year. This situation has to be combated.

Energy Security, which means ensuring that our country can supply lifeline energy to all its citizens, at affordable costs at all times, is thus a very important and significant need and is an essential step forward. But it must be considered as a transition strategy, to enable us to achieve our real goal that is - Energy Independence or an economy which will function well with total freedom from oil, gas or coal imports. Is it possible?

Hence, Energy Independence has to be our nation's first and highest priority. We must be determined to achieve this within the next 25 years i.e by the year 2030. This one major, 25-year national mission must be formulated, funds guaranteed, and the leadership entrusted without delay as public-private partnerships to our younger generation, now in their 30's, as their lifetime mission in a renewed drive for nation-building.

Goals and Policies

Now friends, I would now like to discuss with you some goals, strategies and policies for a major national mission to attain Energy Independence.

Energy Consumption Pattern in India in 2005: We have to critically look at the need for Energy Independence in different ways in its two major sectors: Electric power generation and Transportation. At present, we have an installed capacity of about 121,000 MW of electricity, which is 3% of world capacity. We also depend on oil to the extent of 114 million tonnes every year, 75% of which is imported, and used almost entirely in the Transportation Sector. Forecasts of our Energy requirements by 2030, when our population may touch 1.4 billion people, indicate that demand from power sector will increase from the existing 120,000 MW to about 400,000 MW. This assumes an energy growth rate of 5% per annum.

Electric Power Generation Sector: Electric power generation in India now accesses four basic energy sources: Fossil fuels such as oil, natural gas and coal; Hydroelectricity; Nuclear power; and Renewable energy sources such as bio-fuels, solar, biomass, wind and ocean.

Fortunately for us, 89% of energy used for power generation today is indigeneous, from coal (56%), hydroelectricity (25%), nuclear power (3%) and Renewable (5%). Solar energy segment contributes just 0.2% of our energy production.

Energy Independence in Electric Power Generation

Thus it would be seen that only 11% of electric power generation is dependent on oil and natural gas which is mostly imported at enormous cost. Only 1% of oil is (about 2-3 million tonnes of oil) being used every year for producing electricity. However, power generation to the extent of 10% is dependent on high cost gas supplies. We are making efforts to access natural gas from other countries.

Now I shall discuss another fossil fuel, coal. Even though India has abundant quantities of coal, it is constrained to regional locations, high ash content, affecting the thermal efficiency of our power plants, and also there are environmental concerns. Thus, a movement towards Energy Independence would demand accelerated work in operationalizing the production of energy from the coal sector through integrated gasification and combined cycle route. In 2030, the total energy requirement would be 400,000 MW. At that time, the power generated from coal-based power plants would increase from the existing 67,000 MW to 200,000 MW. This would demand significant build-up of thermal power stations and large scale expansion of coal fields.

Changing Structure of Energy Sources:

The strategic goals for Energy Independence by 2030 would thus call for a shift in the structure of energy sources. Firstly, fossil fuel imports need to be minimized and secure access to be ensured. Maximum hydro and nuclear power potential should be tapped. The most significant aspect, however would be that the power generated through renewable energy technologies may target 20 to 25% against the present 5%. It would be evident that for true Energy Independence, a major shift in the structure of energy sources from fossil to renewable energy sources is mandated.

Solar farms

Solar energy in particular requires unique, massive applications in the agricultural sector, where farmers need electricity exclusively in the daytime. This could be the primary demand driver for solar energy. Our farmers demand for electric power today is significantly high to make solar energy economical in large scale.

Shortages of water, both for drinking and farming operations, can be met by large scale seawater desalination and pumping inland using solar energy, supplemented by bio-fuels wherever necessary.

The current high capital costs of solar power stations can be reduced by grid-locked 100 MW sized Very Large Scale Solar Photovoltaic (VLSPV) or Solar Thermal Power Stations. In the very near future, breakthroughs in nanotechnologies promise significant increase in solar cell efficiencies from current 15% values to over 50% levels. These would in turn reduce the cost of solar energy production. Our science laboratories should mount a R&D Programme for developing high efficiency CNT based Photo Voltaic Cells.

We thus need to embark on a major national programme in solar energy systems and technologies, for both large, centralized applications as well as small, decentralized requirements concurrently, for applications in both rural and urban areas.

Nuclear Energy

Nuclear power generation has been given a thrust by the use of uranium based fuel. However there would be a requirement for a ten fold increase in nuclear power generation even to attain a reasonable degree of energy self sufficiency for our country. Therefore it is essential to pursue the development of nuclear power using Thorium, reserves of which are higher in the country. Technology development has to be accelerated for Thorium

based reactors since the raw material for Thorium is abundantly available in our country. Also, Nuclear Fusion research needs to be progressed with international cooperation to keep that option for meeting the large power requirement, at a time when fossil fuels get depleted.

Power through Municipal Waste

In the Power generation Sector of the energy economy, we need to fully use the technologies now available for generating power from municipal waste. Today, two plants are operational in India, each plant generating 6.5 MW of electric power. Studies indicate that as much as 5800 MW of power can be generated by setting up 900 electric power plants spread over in different parts of the country, which can be fueled by municipal waste. The electric power generation and creation of clean environment are the twin advantages.

Power System Loss Reduction:

Apart from generating power and running power stations efficiently without interruption, it is equally essential to transmit and distribute the power with minimum loss. The loss of power in transmission and distribution in our country is currently in the region of 30-40% for a variety of reasons. Of about one thousand billion units of electrical energy produced annually, only 600 billion units reach the consumer. This is the result of transmission loss and unaccounted loss. We need to take urgent action to bring down this loss to 15% from 30-40% by close monitoring of the losses, improving efficiency, and increasing the power factor through modern technology. By this one action alone we will be able to avoid the need for additional investment of around Rs. 70,000 crores for establishing additional generating capacity.

Transportation Sector

The Transportation Sector is the fastest growing energy consumer. It now consumes nearly 112 million tonnes of oil annually, and is critically important our nation’s economy and security. The complete substitution of oil imports for the Transportation Sectors is the biggest and toughest challenge for India.

Use of biofuels: We have nearly 60 million hectares of wasteland, of which 30 million hectares are available for energy plantations like "Jatropha". Once grown, the crop has a life of 50 years. Each acre will produce about 2 tonnes of bio-diesel at about Rs. 20 per litre. Biodiesel is carbon neutral and many valuable by-products flow from this agro-industry. Intensive research is needed to burn bio-fuel in internal combustion engines with high efficiency, and this needs to be a urgent R&D programme. India has a potential to produce nearly 60 million tones of bio-fuel annually, thus making a significant and important contribution to the goal of Energy Independence. Indian Railways has already taken a significant step of running two passenger locomotives (Thanjavur to Nagore section) and six trains of diesel multiple units (Tiruchirapalli to Lalgudi, Dindigul and Karur sections) with a 5% blend of bio-fuel sourced from its in-house esterification plants. In addition, they have planted 75 lakh Jatropha saplings in Railway land which is expected to give yields from the current year onwards. This is a pioneering example for many other organisations to follow. Similarly many States in our country have energy plantations. What is needed is a full economic chain from farming, harvesting, extraction

to esterification, blending and marketing. Apart from employment generation, bio-fuel has a significant potential to lead our country towards energy independence.

The other critical options are development of electric vehicles; hydrogen based vehicles, electrification of Railways and urban mass transportation.

Conclusion

By 2020 the nation should achieve comprehensive energy security through enhancement of our oil and gas exploration and production worldwide. By the year 2030, India should achieve energy independence through solar power and other forms of renewable energy; maximize the utilization of hydro and nuclear power and enhance the bio-fuel production through large scale energy plantations like Jatropha.

We need to evolve a comprehensive renewable energy policy for energy independence within a year. This should address all issues relating to generation of energy through wind, solar, geothermal, bio-mass and ocean. The nation should also work towards establishment of thorium based reactors. Research and technology development of Thorium based reactors is one of the immediate requirements for realizing self-reliance in nuclear power generation and long term energy security for the nation.

We should operationalize a 500 MW capacity power plant using integrated gasification and combined cycle route within the next three years from the existing pilot plant stage.

Bio-fuel research should be extended in collaboration with R&D Laboratories, academic institutions and automobile industry to make it a "full fledged fuel" for the fleet running in the country in a time bound manner. This should lead to a mission mode integrated programme encompassing various ministries and industries. Also there is a need to formulate a comprehensive Bio-Fuel policy from research, development, production to marketing.

Energy security leading to Energy independence is certainly possible and is within the capability of the nation. India has knowledge, natural resources; what we need is planned integrated missions to achieve the target in a time bound manner. Let us all work for self-sufficient environment friendly energy independence for the nation.

JAI HIND.

May God Bless you all".