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# Energy scenario in Himachal Pradesh and make in India vision 2030

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**Abstract**
The slogan of Make in India aims at converting India into a developed nation and boosting up the Indian economy by 2030. It is a visionary initiative involves manufacturing the goods and services within the national boundaries. This initiative has framed plans which will help in boosting up investments in 25 different sectors in India.
Himachal Pradesh holds the population of around 6,856,509 as per the census data of the year 2011, and such a big population demands more energy. Government also makes use of the non conventional sources of energy such as solar, wind, hydro to generate electricity. This paper is based on secondary data and attempts to study the vision of Make in India 2030, correlate it with the energy sector of Himachal Pradesh and efforts taken up to generate electricity using types of renewable energy sources so as to cater to the needs of every individual household.

**Keywords:** make in India, renewable, gross domestic product

## 1. Introduction
The initiative of the programme was firstly announced by the Prime Minister on September, 2014 as a reactive measure for the fall in the India's growth rate and continuous break down of the stock market. The movement so started demanded cooperation, dedication and patience from the manufacturers, stakeholders, partners etc. With Make in India came the promise to quit the practice of importing goods and services from other countries and take steps in order to manufacture the goods within India and within the own capacity. A full- fledged plan was framed so that all the sectors of the Indian economy gets benefit out of it including the service sector, agriculture, aviation, education, energy, horticulture, pharmaceuticals etc.
The programme saw immediate success and one of the indicators of success was increase in foreign direct investment in most important sectors such as medicine, insurance, aviation, space, railways and defence. As far as renewable energy sector is concerned, Make in India has added up to the benefits for the energy sector as well by permitting 100% FDI in the sector so as to generate the energy as well as distribute it, thus attracting more foreign investors. India is the fifth largest power generation portfolio in the world and its current renewable energy contribution stands at 44.812 GW which includes 27.441 GW of Wind power and 8.062 GW of Solar power installed capacity in the country as on 31.07.2016. Ambitious targets include 175 GW of renewable power by 2022 which will include 100 GW of Solar power, 60 GW from wind power, 10 GW from biomass power and 5 GW from small hydro power[1].
The journey to fully developed nation will be fuelled up when every state will realise its responsibility and will discover its own strengths and weaknesses and will add up towards the vision 2030. The present paper is in special reference to Himachal Pradesh and steps taken up by the state to device new ways to generate electricity and contribute towards the 2030 vision of Make in India. Himachal Pradesh is a state catering the electricity needs of 6,856,509 individuals as per the census data of the year 2011 and for this renewable resources are used and number of hydro power projects are taken up for the same and numerous solar heaters have been installed and made many factories equipped with solar roof tops. All this added up to the attainment of vision 2030 and making India a developed nation in coming 15 years.

## 2. Objectives
Following are the objectives of the study:
i) To briefly study the vision of Make in India – 2030
ii) To highlight the steps taken up by the government towards attaining vision 2030.
iii) To study the scenario of energy sector in HP and the challenges faced in initiating the plan.

## 3. Research Methodology
The present paper is a result of extensive literature survey and secondary data has been collected from various websites, journals, research paper so as to get exact statistics regarding the renewable energy scenario in India as well as Himachal Pradesh.

## 4. Energy scenario in India
The Make in India slogan added up to the list of responsibilities of different states. It aimed at improving the overall economic growth of India till 2030 by benefitting 25 major sectors including hospitality, biotechnology, renewable energy, automobile, aviation, oil and gas, roads and railways etc. India holds approximately 1.34 billion population[2] and a nation with so many individuals and households demands a large quantity of electricity for fulfilling day to day needs. In order to serve such a big population, India has set up various projects at different locations and tries to extract out energy from renewable resources such as sun, wind, water etc.
There are number of renewable resources such as solar energy which makes use of the sun rays in order to generate electricity with the help of high level technologies such as solar heating, solar thermal energy, photo-voltaic etc. Wind energy refers to the process where wind turbines are used to grab the wind and

generate electricity out of it by converting kinetic energy into mechanical energy. On the other hand water energy is also known as hydro power where electricity is generated using the flow of running water. The running water is captured in dams through which electricity is generated.

The generation of power is taken up in different states and with this India has become the fifth largest country to make use of renewable energy in order to generate electricity. Renewable energy refers to the energy which is naturally present on the earth and through which electricity is generated by natural means. Generation of electricity on its own helps in achieving the 'Make in India' vision and also helps in balancing out the 'Balance of Payment' accounts. It will also reduce the dependency of the nation on expensive imported fossil fuels therefore the money saved from non-importing can be utilized in improving other areas of the nation.

Data as on 31 July, 2016 reveals that India's contribution towards renewable energy is 44.812 GW including 8.062 GW for solar powers, making it third largest installed solar power capacity and 27.441 GW of wind power thus making it fourth largest capacity of wind power. The overall renewable energy contribution can be counted to be 14.7% of the total installed capacity in the country. The Make in India program aims at benefiting the renewable energy sector by reaching the target of 175 GW of total renewable power by 2022 and adding up to the installed capacity of solar power to 100 GW, 60 GW from wind power and 10 GW from biomass. In order to enhance the working of energy sector and add to the benefit and profits of this sector Government have taken various steps to ensure success such as by allowing 100% FDI for energy generation and distribution projects as a result number of investments will increase.

Table 1 indicates the production of electricity and heat from different sources along with the domestic supply for the year 2014. From the table it is clear that the maximum production of electricity is from the use of coal i.e. 966520 GWH followed by the generation of electricity using hydro power around 131643 GWH. The entire production of electricity from different sources added up to 1287398 GWH. Table 1 also reveals that apart from the self-generated electricity, India also imported 5008 GWH of electricity thus adding up to the overall domestic supply to 1292406 GWH.

**Table 1:** Energy Scenario in India for the year 2014

| Production From | Electricity (Gwh) | Heat (Tj) |
|---|---|---|
| Coal | 966520 | 0 |
| Oil | 22696 | 0 |
| Gas | 62929 | 0 |
| Bio-fuels | 23908 | 0 |
| Waste | 1536 | 0 |
| Nuclear | 36102 | 0 |
| Hydro | 131643 | 0 |
| Geothermal | 0 | 0 |
| Solar PV | 4909 | 0 |
| Wind | 37155 | 0 |
| Total Production | 1287398 | 0 |
| Imports | 5008 | 0 |
| Exports | 0 | 0 |
| Domestic Supply | 1292406 | 0 |

(***Source*:** International Energy Agency statistics 2014)

**Table 2:** Renewable power capacity targets to be achieved by 2022

| Sector | Target (MW) | Achievement (as on April-Sept 2016) (MW) |
|---|---|---|
| Wind Power | 4000 | 1305.50 |
| Solar Power | 12000 | 1750.38 |
| Small hydro Power | 250 | 49.40 |
| Bio Power | 400 | 51.00 |
| Waste to Power | 10 | 7.50 |
| Total | 16660 | 3163.78 |

(***Source*:** http://mnre.gov.in/mission-and-vision 2/achievements)

## 5. Drivers for Growth

The energy generation using the renewable sources is a visionary attempt in order to serve all the individuals and households with continuous power supply and also reduce the dependency on foreign countries for high quality fossil fuels. As for now India is the fourth largest importer of oil and the 15th largest importer of petroleum products and Liquified Natural Gas (LNG) globally. The increased use of indigenous renewable resources is expected to reduce India's dependence on expensive imported fossil fuels.[3]

Generating electricity by using natural resources such as wind, water, sun needs full support from the government and the higher authorities with high level of coordination and commitment. There are a number of steps that are taken up by government in order to add up to the growth of energy sector in India:

1. Number of incentives has been offered by the Government of India through the Ministry of New and Renewable Energy (MNRE) such as capital and interest subsidies, concessional finance, fossil based energy options, generation based incentives etc.
2. More lenient environment has been created for the foreign investors for investing in the energy sector by allowing 100% FDI for both generation as well as distribution. With such a liberal scenario more investors are attracted towards this sector which brings in more money for the nation.
3. The importance of energy generation has been shifted from fossil- based generation to the use of renewable energy sources for producing energy and for example due to the increase in the demand for this technique the solar module prices have declined by almost 80% since 2008.
4. It is evident that in order to generate energy from renewable resources high level of expertise is required and the employees should be fully skilled to do so. The Government while focusing on developing the skills of the workers has lunched "Suryamitra Scheme" as on May 2015. Under this scheme training within a period of 5 years, is being provided to 0.05 million personnel so as to enhance their training skills and make them fit for making use of renewable resources.
5. Reserve Bank of India (RBI) has also taken up steps to support the moment. It has revised its guidelines to be followed by all the commercial banks and has included a category of renewable energy for the priority sector lending. It has eased the procedure for taking loans by the priority sectors related to renewable energy and also now the bank loans taken up for solar rooftop systems shall be treated as a part of home loan or home investment loans along with certain tax benefits.

6. Government apart from avoiding the use of fossil fuels for power generation also aims at reducing the cost of solar power generation in the country through long term policy, various research and development programs, domestically producing the raw materials etc.
7. Apart from this fiscal concessions and tax benefits have also been given such as concession in the custom duty for specific critical components, exemption from the excise duty, tax exemption on any kind of profit from generating power etc.
8. The Ministry of New and Renewable Energy (MNRE) has taken steps to set up small scale hydro projects in both the public as well as private sectors and also providing them with financial assistance. Even the respective state governments are being supported and encouraged for identification of new potential sites, preparation of the detailed project reports and expansion as well as modification of any old projects.
9. There are certain key provisions in the budget 2016 such as the excise duty on solar water heater and system has been restructured from earlier 12% to either NIL (without CENVAT credit) or 12.5% (with CENVAT credit). Not only this full exemption has been provided on excise duty on round copper wire as well as tin alloys that are used in constructing the solar photovoltaic (PV) ribbons and solar photovoltaic (PV) cells.

There are a number of fast developing renewable resources that are managed by the Ministry for New and Renewable Energy (MNRE) and for the fulfilment of the vision 2030 certain targets have been set up in different sector and types of renewable energy sources.

## 6. Energy Scenario in Himachal Pradesh

The make in India initiative will turn out to be a big success if fully supported by all the states individually and every state finds out new ways to generate electricity using renewable sources. A number of states have joined hands in the program such as the State Electricity Regulatory Commissions of states like Andhra Pradesh, Haryana, Punjab, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Gujarat, Kerala, Punjab, Orissa and West Bengal etc are providing tariffs to the individuals who purchase power generated from the wind power projects.

**Table 3:** State Wise breakdown of the renewable energy targets by 2022

| States/ UT's | Solar Power | Wind Power | Small Hydro Power | Biomass Power |
|---|---|---|---|---|
| Uttar Pradesh | 10697 | | 25 | 3499 |
| Rajasthan | 5762 | 8600 | | |
| Punjab | 4772 | | 50 | 244 |
| Haryana | 4142 | | 25 | 209 |
| Delhi | 2762 | | | |
| Jammu and Kashmir | 1155 | | 150 | |
| Uttrakhand | 900 | | 700 | 197 |
| Himachal Pradesh | 776 | | 1500 | |
| Chandigarh | 153 | | | |
| Northern Region | 31120 | 8600 | 2450 | 2450 |

(Source: http://www.livemint.com)

Table 3 indicates various targets to be achieved in relation to the renewable energy sources in the northern region of the country. The main sources of energy listed are solar, wind, small hydro and biomass. The unit of target is MW. Uttar Pradesh aims at the maximum target of 10,697 MW in utilizing solar power by 2022 as compared to other northern region states. Himachal Pradesh aim at the maximum target of 1500 MW small hydro power capacity in comparison to other states. Himachal Pradesh is a state covering an area of around 55,673 sq km and having a population density of 93 persons per square km. It becomes very important for the state to generate electricity on its own instead of importing expensive fossil fuels and adding up to the balance of payments deficit. Himachal Pradesh is involved in the power supply mainly through the use of hydro and solar energy.

Table 4 indicating the total power supply position of Himachal Pradesh reveals that there is a deficit of 63 MW in the energy as the requirement of 8821 MW exceeds the availability of 8758 MW.

**Table 4:** Total Power Supply Position of H.P

| State | Requirement | Availability | Surplus/ Deficit | |
|---|---|---|---|---|
| | (MU) | (MU) | (MU) | (%) |
| Himachal Pradesh | 8821 | 8758 | -63 | -0.7 |

(***Source*****:** http://www.cea.nic.in)

As far as solar power potential of HP is concerned, according to the National Institute of Solar Energy (NISE) estimation is done regarding the potential of 34 GW taking into account 3% of total wasteland and roof top surface areas of the consumers. IREDA has estimated a potential of about 53 GW taking in to account 5% of the waste land. Therefore, the State has huge solar power potential.[4] In Himachal Pradesh there is only one solar park (is a concentrated zone of development of solar power generation projects, and providing the developers an area that is properly infra-structured) is located in the Spiti Valley having a capacity of around 1000 MW and is implemented by HP State Electricity Board Ltd. Apart from this MNRE has plans to set up 25 additional solar parks across India having a capacity between 500 to 1000 MW and as a result fulfilling the target of around 20000 MW of installed solar capacity.

Also a solar power policy, 2016 has been launched by the government of India having main objective of contributing towards the vision 2030 by increasing the share of renewable energy in the total energy consumption by the nation and to create awareness regarding the importance of renewable energy among people. Under this scheme number of solar roof tops, solar heaters, solar bulbs have been installed in different parts of the state.

Most of the energy is generated using hydro power to serve large number of individuals and households of Himachal Pradesh. The state government is making efforts in setting up various small hydro power projects and as on October 2015, around 655 small hydroelectric projects have been allotted holding the total capacity of 1596.805 MW. Out of which 67 major projects have already been commissioned and have an aggregate capacity of 262.55 MW. A total of 13 projects holding 16.87 MW capacity have been allotted to Himurja for development in the state sector. Himachal is rich in water sources and has a number of tributaries flowing by the state and government makes use of the hydro for the generation of electricity to large extent. Number of projects has been allotted for the purpose of electricity generation and achievement of the Make in India vision 2030. Following table 5 reveals the list of projects offered for allotment having a capacity of up-to 5.00 MW. It should be noted that the table highlights only few important projects out of a total of 655 projects and indicating the name of the project, district and the capacity.

**Table 5:** List of Hydro Projects in HP with capacity of 5.00 MW

| S. No | Project Name | District | Capacity (MW) |
|---|---|---|---|
| 1 | Dhugli | Chamba | 3.50 |
| 2 | Chirchind | Chamba | 5.00 |
| 3 | Chobia –I | Chamba | 5.00 |
| 4 | Manikaran | Kullu | 4.00 |
| 5 | Gajeu Gunadev | Kangra | 2.00 |
| 6 | Uhl Barah | Mandi | 4.50 |

(Source: http://himurja.nic.in/mousigned.html)

## 7. Challenges faced in implementing the Plans

On September 2014 Mr. Narendra Modi took a step ahead in order to make the country a global hub, increasing the growth rate and making India a developed country by 2030 and launched a visionary scheme of Make in India. The launched scheme named Make in India refers to the program whereby steps are taken up to make India self-reliant in itself and encourage to manufacture goods and services within the boundaries of India. This will help in reducing the dependency of the nation on foreign countries for expensive raw materials which in turn will help in maintaining the balance of payments situation.

Making India self-reliant will help in generating employment for skilled youth, will help attract more foreign direct investment from around the world and will ultimately boost up the entire economic growth. Apart from the above mentioned benefits there are a number of challenges that are faced in the proper achievement of the Make in India vision 2030. Following are the main hurdles that are experienced:

1. One of the biggest challenge is the stringent behavior of the government regarding the procedural and regulatory clearances of the projects. In compliance with Make in India a number of projects have been planned in order to make all the respective sectors self-reliant but implementation of the projects is always delayed due to the lengthy and delayed procedure of approval of the projects. As a result a healthy environment is not possible.
2. Another factor is the existence of un-favorable factors in the environment that must be removed in order to make India a manufacturing hub. Also government should always be willing to give tax concessions to the companies who willingly set up units in India.
3. Another challenge is to frame proper and achievable plans for the small and medium sized industries as these industries contribute a lot towards making India manufacturing hub. Giving all the industries various incentives on the basis of their capacity and seeing that there is an increase in their working capacity is a big time challenge.
4. Next hurdle are the efforts to be taken up by India in order to be edge to edge with the China's 'Made in China' campaign launched on the very same day. India should try to keep up to the pace of the competition and add up to the strengths of the nation.
5. Creating a better platform for the high degree of research and development is a big hurdle for the implementation of Make in India program. In order to improve the manufacturing standards technology up-gradation is must which should be supported by high level of R&D department.
6. For the growth of the manufacturing sector high level of infrastructure is required and the World Economic Forum's Global Competitiveness Report (2015-16) has ranked India on 81st position out of 140 countries in relation to infrastructural deficiency. Quality infrastructure is one the major issues faced by most of the manufacturing industries which hampers the growth of nation towards easily achieving the Make in India Vision 2030.

## 8. Conclusion

Make in India campaign can turn out to be a big success by the efforts of Narendra Modi. The primary aim of the campaign is to convert India into a fully self-reliant manufacturing hub by the end of 2030. For this number of policies have been framed taking into consideration 25 sectors in all. The sectors that are benefited by this campaign are energy, automobile, roads and railways, aviation, defence, oil and petroleum etc. Energy is very important part for the survival of every individual and is needed for day to day activities. In order to benefit the entire sector it is important to ensure full utilisation of sources of energy and generate electricity on its own rather than importing from outside. Use of renewable sources such as solar, wind, water, biomass is more affordable as compared to the non-renewable resources such as oil, fossil fuels etc.

India is the fifth largest power generation portfolio in the world and its current renewable energy contribution stands at 44.812 GW which includes 27.441 GW of Wind power and 8.062 GW of Solar power installed capacity in the country. Under Make in India campaign the target is to reach 175 GW of total renewable power by 2022 and adding up to the installed capacity of solar power to 100 GW, 60 GW from wind power and 10 GW from biomass. There are a number of steps that are taken up by government in order to add up to the growth of energy sector in India such as number of incentives have being offered by the Government of India through the Ministry of New and Renewable Energy, various fiscal and tax benefits, full exemption on duties of round copper wire etc.

Contribution of all the states is required in order to meet the targets of vision 2030 and as far as HP is concerned the total power supply position of Himachal Pradesh reveals that there is a deficit of 63 MW in the energy as the requirement of 8821 MW exceeds the availability of 8758 MW and the targets set for 2022 are 776 MW for solar power and 1500 MW for small

hydro power. Various small hydro projects are also allotted with total capacity of 1596.805 MW and total of 13 projects holding 16.87 MW capacity have been allotted to Himurja for development in the state sector. As far as solar power potential of HP is concerned, IREDA has estimated a potential of about 53 GW taking in to account 5% of the waste land hence the State has huge solar power potential. Attaining such targets and making India self-reliant will reduce the dependency for purchasing expensive raw materials, will generate employment opportunities for young India and will help in achieving the targets of Make in India vision 2030.

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