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Chapter 1 : Energy policy of India - Wikipedia

The purpose of this research has been to explore the relationship between energy resource development and economic development in India. The thesis which evolved from the research is that energy resource development has lagged behind and constrained economic development in India.

Wind power in India India has the fourth largest installed wind power capacity in the world. Availability of cheap solar can bring electricity to people, and bypass the need of installation of expensive grid lines. Installation of solar power PV plants require nearly 2. There is unlimited scope for solar electricity to replace all fossil fuel energy requirements natural gas, coal, lignite and crude oil if all the marginally productive lands are occupied by solar power plants in future. The installed capacity of commercial solar thermal power plants in India is The great thing about solar power is that it is a technology and not a fuel. It is unlimited and the more it is deployed the cheaper it would be. The major disadvantage of solar power PV type only is that it can not produce electricity during the night time and cloudy day time also. In India, this disadvantage can be overcome by installing pumped-storage hydroelectricity stations. Also, all existing and future hydro power stations can be expanded with additional pumped-storage hydroelectricity units to cater night time electricity consumption. Most of the ground water pumping power can be met directly by solar power during daytime. To achieve food security , India needs to achieve water security which is possible only by energy security for harnessing its water resources. Electric vehicle industry in India The retail prices of petrol and diesel are high in India to make electricity driven vehicles more economical as more and more electricity is generated from solar energy in near future without appreciable environmental effects. During the year , many IPPs offered to sell solar power below 6. The retail price of diesel is The retail price of petrol is In , India consumed Replacing LPG consumption with electricity reduces its imports substantially. The domestic consumption of Kerosene is 7. The subsidised retail price of Kerosene is During the year , The plant load factor PLF of coal-fired thermal power stations is only Enhancing the PLF of coal-fired stations and encouraging domestic electricity consumers to substitute electricity in place of LPG and Kerosene in household cooking, would reduce the government subsidies and idle capacity of thermal power stations can be put to use economically. During the year , IPPs are offering to sell solar power below 5. Bangladesh, Myanmar and Pakistan have proven reserves of billion cubic metres bcm , bcm and bcm respectively. India can also enter into long term power purchase agreements with China for developing the hydro power potential in Brahmaputra river basin of Tibet region. India can also supply its surplus electricity to Sri Lanka by undersea cable link. There is ample trading synergy for India with its neighbouring countries in securing its energy requirements. Other examples of encouragement by incentive include the use of nuclear energy India Nuclear Cooperation Promotion Act , promoting windfarms such as Muppandal , and solar energy Ralegaon Siddhi. A long-term energy policy perspective is provided by the Integrated Energy Policy Report which provides policy guidance on energy-sector growth. Electricity sector in India The installed capacity of utility power plants is The installed capacity of captive power plants in industries 1 MW and above is 50, MW as on 31 March and generated billion kWh in the financial year Shown here villagers heating tea with the help of firewood. Total installed Power generation Capacity end of April [] Source.

Chapter 2 : India Energy Portal

DOWNLOAD ENERGY AND ECONOMIC DEVELOPMENT IN INDIA energy and economic development pdf Energy development is the field of activities focused on obtaining sources of energy from natural resources.

International Energy Agency IEA has measured that towards limiting the temperature rise to two degree centigrade ppm, or, ppm scenario by [32], the total installed capacity of renewable energy sources for electricity production needs to be augmented GW by India is the fourth largest energy consumer in the world after the United States, China and Russia [18]. As of March , the per capita total electricity waster in India was Electricity waster in India is expected to rise to around Bkwh by â€”22 and around BkWh by â€”32 [9]. The reasons for according renewable energy may vary in case of developed and developing economies. Developed nations are promoting clean energy technologies due to their heightened sensitivity towards the environment and being mandated under the various international climate conventions like the United Nations Framework on Climate Change, or, UNFCCC [16]. India has its own sets of reasons for pursuing a low-carbon growth direction. The electricity requirement is projected to increase to Billion units BU by the year [30], from the present levels of about BU [27]. Renewable Energy projects are associated with high opposite capital cost and lower levels of energy generation due to limited availability of natural resources like solar radiation and wind velocity , leading to higher cost of energy generation. Besides, they lack the ability to reach economies of scale due to limited availability of contiguous land area in resource rich regions ; most wind and solar projects are limited to not more than few hundred megawatts of capacity. The developing economies, there are constraints in terms of availability of monetary resources at competitive terms due to competing demands from other sectors like education, healthcare, agriculture and infrastructure. As such, it is of paramount importance that utilization of scare resources is done in the most prudential manner. Power generation Mix of India 2. Despite tremendous grow thin electricity generation, country continues to face both energy and peak deficit. During the year â€”15, there would been energy shortage of 5. As the economy grows in coming years the electricity demand will further rise as there is strong correlation between rise in energy consumption and economic growth. India has been putting steady efforts at increasing its energy generation capacity. However, the demand for energy has been continuously out stripping supply. The table given below indicates the region wise installation capacity of different sources of electricity. The Indian power sector is one of the most diversified in the world. The sector has been continuously progressing in generation capacity addition through conventional like Coal, lignite, gas, hydro and nuclear power as well as non-conventional sources like Wind, solar, small hydro and biomass. Total installed capacity of power plant in the country stands at Sources of electricity of India Table 2. Renewable Energy Renewable energy is derived from natural processes that are replenished constantly. India is blessed with a variety of renewable energy sources, the main ones being biomass, biogas, sun, wind, geothermal, tidal and small hydro power. Large hydro power is also renewable energy in nature, but has been utilized all over the world for many decades, and is generally not included in term new and renewable source of energy. As of 31 March , India had an installed capacity of about Climate change is one of the primary concerns to go with renewable energy. Power infrastructure and energy dependencies. There are huge amount of potential available in the renewable energy system which can be explored and harnessed to meet the energy demand. The potentially most important environmental problem India is facing alarming challenges to build up its energy infra- structure to meet its economic and social targets due to increasing demand of electricity. In terms of wind power installed capacity, India is ranked 5th in the World. The present total installed capacity stands at Today India is a major player in the global wind energy market. Tamil Nadu, Maharashtra, Karnataka, Rajasthan, Gujarat are the key states which have been focusing on wind energy development in India. Initial cost for wind turbines is greater than that of conventional fossil fuel generators per MW installed. Despite the high installed capacity, the actual utilization of wind power in India is low because policy incentives are geared towards installation rather than operation of the plants. This is why only 1. Lack of wind or high speed of wind affects variability of power generation through wind. Among the various renewable energy resources, solar energy potential is the highest in the

country. The equivalent energy potential is about million GWh of energy per year. India lies in the sunny regions of the world. Most parts of India receive 4â€”7 kWh of solar radiation per square meter per day with â€” sunny days in a year [28]. The National Solar Mission targeting 20,MW grid solar Power, MW of off-grid capacity including 20 million solar lighting systems and 20 million square meters solar thermal collector area by is under implementation [2]. The sector has been growing rapidly for the last decade. SHP is by far the oldest renewable energy technology used to generate electricity in India. The current total installed capacity of small hydro power plants is The energy of running water has been exploited for many years. However, Hydro projects can be un reliable during prolonged droughts and dry seasons when rivers dry up or reduce in volume. Renewable source of energy other than hydro power energy, solar, wind and geothermal sources, currently provide only a small fraction of global energy use. The most prevalent source of energy is bio mass. Bio mass is biological material derived from living, or recently living organisms. It most often refers to plants or plant-based materials which are specifically called lignocellulosic bio-mass [24]. Biomass include wood, logging wastes and sawdust, animal dung and vegetable matter consisting of leave, crop residues and agricultural waste. According to the CEA, India had at least 3. A large amount of biomass used for electricity generation comes from bagasse cru- shed sugarcane or sorghum stalks , which can be used in combustion-powered generators. In India, the bio mass programmes are mainly targeted to meet the needs of rural and remote areas and have helped in reaching electricity to the interior un-reached section of the population. Bio mass is one such source that can be used to provide sustainable supply of the required energy through bio gas, vegetable oil, bio diesel, producer gas, and by directly burning the bio mass. Bio mass can be con- verted in to suitable form of energy through different conversion technology. Bio mass power generation in India is an industry that attracts investments of over Rs. Wind Energy in India Scheme 2. Solar Energy in India Figure 2. Renewable Energy in India Figure 3. Renewable Energy future in India 4. The Government of India provides subsidy under various schemes to promote the use of renewable technologies till they attain commercial status. B Accelerated depreciation Allows investments in renewable projects to be fully or partially deducted from tax obligations or income; it is a kind of production tax credit. For remaining years, the company has to pay corporate tax present rate is In case of India, the price is determined by the respective state electricity regulatory commission SERC , or central electricity regulatory commission CERC as the case may be [35]. E Renewable purchase obligations Designated consumers distribution utilities and large power consumers are required to procure a certain percentage of their total power consumption from RE sources. Economic Viability of Renewable Energy Table 4. Levelized cost of electricity Production The initial capital cost of installation is higher in most of the renewable sources except hydro. But the cost of operation and maintenance is comparatively cheaper than thermal or nuclear power plants. Also since the cost of fuel is none for renewable energy sources. With increase in prices of coal, gas and other fossil fuels renewable sources will become comparable or cheaper than conventional power sources and will thus become economically viable. Renewable energy is the best option. Shortage of fossils fuel and awareness towards global warming enhance the clean energy production. Therefore use of renewable sources increasing gradually in coming years [23, 3]. Renewable energy technologies require large initial capital investments, making the levelized cost of generation higher than it is for many conventional sources. These include interest and capital subsidies. The broad aim of the Ministry is to develop and deploy new and renewable energy for supplementing the energy requirements of the country. MNRE at the central level. A number of institutions have been created in India for promotion of renewable energy. Conclusions Developing economies have set ambitious Renewable Energy capacity addition targets to reduce energy exportation on estimate of their growing and developing economy. India has sufficient potential of renewable energy but combination of the right technology and correct human behaviour is needed because every technology have their own limitation, then having peoples readiness to accept of Renewable Energy. India will can be use many of these tools innovatively to achieve an impressive growth in its Renewable Energy sector with a high impact on the ground green power generation and a low dependency upon financial support. Hyderabad; May 23, Integrated plan for desert power development. Power Grid Corporation Limited; World Energy Outlook Special Report. International Energy Agency; Book [6] Energy Sources A: Recover Utile Environ Evaluating policies in support of the deployment of renewable

power. The International Renewable Energy Agency; Book chapter [7] Executive Summary Power Sector. Ministry of Power, Government of India; May Book [8] Garg, P. Energy Scenario and Vision in India. JSustain Energy Environ ; 3: Book [9] Growth of electricity sector in India from

Chapter 3 : Partnership for Clean Energy | India | U.S. Agency for International Development

Energy Security and Economic Development in India: a holistic approach attempts to construct an appropriate definition for the concept of energy security. The evolution of energy security is traced at both the global level and in the Indian context.

There is a strong two-way relationship between economic development and energy consumption. On one hand, growth of an economy, with its global competitiveness, hinges on the availability of cost-effective and environmentally benign energy sources, and on the other hand, the level of economic development has been observed to be reliant on the energy demand. Energy intensity Table E. The energy intensity of India is over twice that of the matured economies, which are represented by the OECD Organization of Economic Co-operation and Development member countries. This could be attributed to several factors, some of them being demographic shifts from rural to urban areas, structural economic changes towards lesser energy industry, impressive growth of services, improvement in efficiency of energy use, and inter-fuel substitution. The energy sector in India has been receiving high priority in the planning process. The total outlay on energy in the Tenth Five-year Plan has been projected to be 4. An increase of It has, therefore, called for acceleration of the reforms process and adoption of an integrated energy policy. In the recent years, the government has rightly recognized the energy security concerns of the nation and more importance is being placed on energy independence. Primary commercial energy demand grew at the rate of six per cent between and Planning Commission India ranks fifth in the world in terms of primary energy consumption Table E. Despite the overall increase in energy demand, per capita energy consumption Table E. India is well-endowed with both exhaustible and renewable energy resources. Coal, oil, and natural gas are the three primary commercial energy sources. Coal was by far the largest source of energy. However, other forms of commercial energy of a much higher quality and efficiency are steadily replacing the traditional energy resources being consumed in the rural sector. Resource augmentation and growth in energy supply has not kept pace with increasing demand and, therefore, India continues to face serious energy shortages. This has led to increased reliance on imports to meet the energy demand. Coal India now ranks third amongst the coal producing countries in the world. Being the most abundant fossil fuel in India till date, it continues to be one of the most important sources for meeting the domestic energy needs. Despite this increase in production, the existing demand exceeds the supply. India currently faces coal shortage of This shortage is likely to be met through imports mainly by steel, power, and cement sector MoC India exports insignificant quantity of coal to the neighbouring countries. The traditional buyers of Indian coal are Bangladesh, Bhutan, and Nepal. The development of core infrastructure sectors like power, steel, and cement are dependent on coal. The country has made significant progress towards the augmentation of its power infrastructure. The country experienced energy shortage of 7. Per capita electricity consumption rose from merely However, it is a matter of concern that per capita consumption of electricity is among the lowest in the world. Oil and natural gas The latest estimates indicate that India has around 0. The production of crude oil in the country has increased from 6. The production of natural gas increased from 1. The quantity of crude oil imported increased from Besides, imports of other petroleum products increased from 1 MT to 7. The exports of petroleum products went up from around 0. The refining capacity, as on 1 April , was The production of petroleum products increased from 5. Natural gas demand has been growing at the rate of about 6. Industries such as power generation, fertilizer, and petrochemical production are shifting towards natural gas. Several LNG terminals have been planned in the country. Two LNG terminals have already been commissioned: Renewable energy sources Renewable energy sources offer viable option to address the energy security concerns of a country. Today, India has one of the highest potentials for the effective use of renewable energy. Other renewable energy technologies, including solar photovoltaic, solar thermal, small hydro, and biomass power are also spreading. Greater reliance on renewable energy sources offers enormous economic, social, and environmental benefits. The potential for power production from captive and field-based biomass resources, using technologies for distributed power generation, is currently assessed at 19 MW including MW of exportable surplus power from

bagasse-based cogeneration in sugar mills MNES Future scenario Increasing pressure of population and increasing use of energy in different sectors of the economy is an area of concern for India. Driven by the rising population, expanding economy, and a quest for improved quality of life, the total primary energy consumption is expected to about MTOE million tonnes oil equivalent and MTOE in the terminal years of the Tenth and Eleventh Plans, respectively Planning Commission Coal consumption is expected to increase to MT over the forecast period. The use of coal for electricity generation in India is expected to increase by 2. Oil demand in India is expected to increase by 3. It is quite apparent that coal will continue to be the predominant form of energy in future. However, imports of petroleum and gas would continue to increase substantially in absolute terms, involving a large energy import bill. There is, therefore, an urgent need to conserve energy and reduce energy requirements by demand-side management and by adopting more efficient technologies in all sectors.

Chapter 4 : Home Page | SmartPowerIndia

Power & Energy Power and Energy are two essential inputs for economic development and improving the quality of life in India. Development of conventional forms of energy for meeting the growing energy needs of society at a reasonable cost is the responsibility of the Government.

Chapter 5 : Solar Energy to Power India of the Future

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Chapter 6 : Journal of Energy and Development

*Energy and economic development in India (Praeger special studies in international economics and development) [R. K Pachauri] on blog.quintoapp.com *FREE* shipping on qualifying offers.*

Chapter 7 : Renewable energy in India - Wikipedia

The Office of Indian Energy and Economic Development (IEED) was established within the Office of the Secretary, Indian Affairs, U.S. Department of the Interior to provide high-level support for the Department's goal of serving tribal communities by providing access to energy resources and helping tribes stimulate job creation and economic development.

Chapter 8 : Power & Energy | National Portal of India

Energy development is an integral part of enhanced economic development. The fact that expanded provision and use of energy services is strongly associated with economic.

Chapter 9 : Impact of Renewable Energy Consumption on Economics in India

India is the fourth-largest energy consumer in the world, trailing only the United States, China, and Russia. In India had the tenth-largest economy in the world as measured in U.S. dollars (converted at official exchange rates), and the third largest economy in the world when GDP is adjusted for inflation and purchasing power.