

World Energy Needs-It's Time to Shift to Sunlight Based Vitality

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Abstract:-The demand for energy is growing at a substantial rate. The power generation in fact, does not suffice the demand. Hence it is high time when the world needs to think of alternative energy sources, which are renewable and sustainable. Solar energy is one such source. It will help to sustain the lives of millions of underprivileged people in developing countries, especially as it more competitive with other energy sources in terms of cost. This article focuses on the world energy needs, energy generation, the alternative sources available and how various countries are taking their best step forward when it comes to opting for renewable energy.

I. WORLD ENERGY- PRESENT SCENARIO

Today we need energy for every single activity we perform throughout the day in various forms. The global demand for energy is currently growing beyond the limits of actual energy generation capacity. To meet future energy demands efficiently, energy availability and reliability must be improved as well as alternative energy sources should be investigated aggressively. An optimum energy solution should be able to address long-term issues by utilizing alternative and renewable energy sources. Out of the available renewable sources of energy, solar energy is a promising option, as it is extensively available. Solar power may help sustain the lives of millions of underprivileged people in developing countries, especially as it more competitive with other energy sources in terms of cost, also, the solar energy devices can benefit the environment and economy of developing countries.

Jonathan Cullen along with fellow researchers Julian Allwood & Edward Borgstein in their research paper titled "Reducing Energy Demand: What Are the Practical Limits?" projected about how much of current global energy demand could be avoided. There is an increasing concern over the global energy system, whether driven by climate change, national security, or fears of shortage, is being discussed widely and in every arena. They identify physically credible options for change to key design parameters and also predicted the energy savings possible for each system. The outcome states that 73% of global energy use could be saved by practically achievable design changes to passive systems. And with further efficiency improvements in conversion devices, this reduction could still be increased.

As per Robert Dixon, Richard Scheer, Gareth Williams, the global energy demand is predicted to increase by almost 45% during the next 20 years, and the growth would be the fastest in developing and transition countries. In last 20 years, the "Global Environment Facility (GEF)" has invested in a varied portfolio of sustainable energy projects with a special emphasis on energy efficiency, renewable energy, and transportation. These projects address many different national priorities including infrastructure, technologies, policies, best practices, institutions, and capacity building. GEF renewable energy investments of US\$1,298 billion, with co-financing of US\$7,555 billion, have advanced demonstration and deployment of solar thermal heating, solar thermal power, photovoltaic, wind power, geothermal energy, biomass, small hydropower, and combined technologies and many such best practices across 5 continents. These projects by GEF contributed to the direct reduction of about 1.7 billion tons of greenhouse gas emissions. There are several other tangible environmental benefits that arose from these GEF investments.

António Marques, Fuinhas Cardoso & Alberto José for their article "Is renewable energy effective in promoting growth?" did collect a panel data to understand whether economic growth in European countries is anyways linked to various energy sources, controlling for energy consumption and energy dependency. The study suggested growth does not appear to improve with the change towards renewables that the negative effect of the use of renewables supplants the positive effect of creating income by exploiting a natural resource locally, and thus, the high costs of promoting renewables are probably being placed excessively upon the economy.

To suffice the requirement more energy is to be produced. To produce energy fuels are used which result into emission of hazardous gases like CO₂. In order to reduce CO₂ emissions those are energy-related, different options have been considered: energy efficiency improvements, structural changes to low carbon or zero carbon fuel/technologies, carbon sequestration, and reduction in energy-service demands (useful energy). The efficiency and technology options have been extensively studied within the context of climate change mitigation. The results of the CO₂ emission decomposition indicate that a reduction in energy-service

demand can play a limited role, contributing around 5% to global emission reduction in the 21st century.

The world is running out of the sources for energy. We need to understand that there are also alternative energy sources like, wind, water, and solar power, which can provide all of the world's energy needs. And at the same time can eliminate fossil fuels. There is a huge need to construct millions of wind turbines, water machines, and solar installations. These can provide energy to the entire world. We really need to use clean energy such as geothermal energy & solar energy that has near-zero emissions.

II. WORLD MOVEMENT TO RENEWABLE ENERGY

The world is changing dramatically. Global providers of energy and energy-intensive commodities are strategizing to confront the huge energy demands of the world by the year 2015.

With the faster economic growth, particularly in developing economies, the world is consuming natural resources at an unmatched rate. In China, the oil consumption nearly doubled from 1995 to 2004. Similarly, China, India, the Middle East, and Russia are also struggling to build power generation capacity and grids fast enough to meet growth in demand.

In addition to all this countries which are rich in local resources e.g. such as countries in the Middle East and Russia are cheaply extracting the reserves and are increasingly exerting control to seek a greater share of the profits. The security of energy supplies is a matter of growing concern--particularly in countries and regions which consume more energy than they produce like China, Europe, and the United States. The environment is becoming more and more important to business. There is a growing pressure on the businesses to reduce greenhouse gas emissions (especially carbon dioxide). In the power generation industry, the biggest emitter of greenhouse gases uncertain carbon dioxide regulation in Europe is confounding investment in new generating capacity. The renewables have become a substantial business, accounting for 30 % of power generation investments globally in 2005. By 2020, renewables should be able to provide more than 10% of all electricity generated, and technologies such as wind, solar, and biomass could be economical even without subsidies.

Countries across the globe are working on usage of clean energy. There was a clean energy technology trade between the U.S. and China in 2011. The U.S. has \$1.63 billion surplus in clean energy trade compared to China despite China's success in mass production and low-cost assembly of solar cells. It is notable that China holds advantages of in terms of high volume manufacturing and assembly and the leadership of the U.S. in innovation, entrepreneurship, and presence of well-positioned companies.

Japan actually has had no fossil energy sources of its own; it powered much of its economic growth over the past few generations with its home grown nuclear energy. In the beginning of 2011, more than 50 reactors provided Japan with 30 percent of its electricity, and the plan was to increase that share to 50 percent. That scenario was upended on March 11, 2011, when the most powerful earthquake ever to shake Japan touched off a tsunami that breached the defenses of Fukushima Daiichi nuclear power plant on the east coast.

Germany is the world leader in solar energy since the early 2000s. In reality, Germany accounts for nearly 70 percent of the world market for solar panels as well as the equipment required to make them. And it's just over a decade that began in the early 2000s, the country has created thousands of production jobs and hundreds more in R&D through an incentive program, had encouraged number of businesses and households to mount solar panels on their rooftops. In today's scenario, the country has as much installed solar power generation capacity as the rest of the world combined, generating almost 6 percent of its yearly electricity needs from the sun alone.

India can meet its energy needs without N-plants. Two professors at the Indian Institute of Science (IISc) in Bangalore conducted a study and concluded that India's energy needs can be met entirely by solar and other renewable sources. Their report published in the journal *Current Science* may add ammunition to the anti-nuclear agitation in India. The analysis carried out by Hiremath Mitavachan and Jayaraman Srinivasan of IISc's Divecha Centre for Climate Change, India overturns the argument that nuclear power is a must for India because the country is in short of enough land to exploit the potential of solar energy in India.

They say, 4.1 percent of the total uncultivable and waste land area in India is enough to meet the projected annual demand of 3,400 terawatt-hours (TWh) by 2070 just by the solar energy (1 terawatt-hour per annum equals to 114 megawatts). They also conclude that land availability is not a limiting constraint for the solar source as believed. It is noteworthy that these scientists say that their calculations are based on present-day solar photovoltaic (PV) technology and do not include higher efficiencies achieved by new solar cells.

RELiance Industries' Chairman Mukesh Ambani, owner of world's largest oil refinery, said solar power will be at the core of the shift in future source of energy needs -

"We will transfer from hydrocarbon presence which is coal, oil and natural gas over the next few decades into a fully renewable, sustainable future and the solar energy will be at the heart of it,"

Reliance has an exclusive solar division that was established to bring solar energy systems and solutions primarily to the remote and rural areas. "There had been a fundamental transformation in the energy scene in the US. For several

decades, we have heard that the US will be independent of foreign imports of energy. Realistically, I can now tell you that this is my judgment that this will happen in the next 5 or 7 years," he said. "The US has truly found non-conventional energy in shale oil and gas which is really bringing out the advantages not only to the population in the US, but to the entire world," he added.

The solar power is better than electricity generated by coal or natural gas because it does not pollute the environment, saves security costs, and the construction of big and expensive power stations. Solar energy ventures and environmental organizations claim that electricity generated by gas and coal is far more expensive than the end price when all the costs and damage to the economy from the production and supply are factored in.

BIBLIOGRAPHY

- [1]. Barkat Amiram (Jul 10, 2013). No need to subsidize solar energy. *National Economic Council*
- [2]. Blau John, (Mar/Apr2013) Outlook Cloudy for Germany's Solar R&D. *Research Technology Management*. Vol. 56 Issue 2, p4-6. 3p.
- [3]. Bozon, Ivo J. H., Campbell Warren J., Lindstrand Mats. (2007) Global trends in energy, *McKinsey Quarterly*. Issue 1, 46-55.
- [4]. BROWN, ALAN S. (Jul2013) BY THE NUMBERS: AMERICA TOPS CHINA IN CLEANENERGY TRADE. *Mechanical Engineering*. Vol. 135 Issue 7, p30-31.
- [5]. *Chemical Business*. Feb2013, Vol. 27 Issue 2, 19-20.
- [6]. *Chemical Business*. Oct2012, Vol. 26 Issue 10, p14-14. 34p.
- [7]. Cullen Jonathan M., Allwood Julian M., Borgstein Edward H. (2/15/2011). Reducing Energy Demand: What Are the Practical Limits? *Environmental Science & Technology*. Vol. 45 Issue 4, 1711-1718.
- [8]. Devabhaktuni Vijay, Alam Mansoor, ShekaraSreenadh Reddy Depuru Soma, Green Robert C, Nims Douglas, Near Craig. (Mar2013). *Renewable & Sustainable Energy Reviews*, Vol. 19, 555-564.
- [9]. Dixon Robert, Scheer Richard, Williams Gareth. (Jan2011). Sustainable energy investments: contributions of the Global Environment Facility. *Mitigation & Adaptation Strategies for Global Change*; Vol. 16 Issue 1, 83-102.
- [10]. Jacobson, Mark Z. Delucchi, Mark A. (Nov2009,) *Scientific American*; Vol. 301 Issue 5, 58-65
- [11]. Kesicki Fabian, AnandarajahGabrial. (Nov2011). The role of energy-service demand reduction in global climate change mitigation: Combining energy modelling and decomposition analysis. *Energy Policy*, Vol. 39 Issue 11, 7224-7233.
- [12]. Marques, António, Cardoso Fuinhas, José Alberto. (Jul2012). Is renewable energy effective in promoting growth? .
- [13]. Yvonne Chang in Tokyo For *National Geographic* Published on August 14, 2013