Challenges and Strategies for Universal Access to Energy

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ABSTRACT

Energy sustainability is a major challenge for today's development. The energy availability and the universal access of energy is essentially required for sustaining the civilization else humanity will roll back to stone age. As per the recent reports the estimate by International Energy Agency which says that around 1.3 billion people lack access to electricity and 2.7 billion people lack clean cooking facilities. These deficiencies can be met by the two pronged strategy of enhancing energy availability and facilitation of universal energy access. The sustainable energy can bridge the gap for critical requirement of eliminating poverty, reducing gap between rich and poor along with minimizing adverse impact on climate. In this paper an effort is made as to how to identify the area and make sustainable energy for future development.

Keywords *: Sustainable Energy, Energy Transformation, Energy Economy.*

1. INTRODUCTION

Present day civilization relies primarily on the availability of energy. Energy has become the driver for betterment of humanity. Due to continuous efforts for replacing muscle power with machine in industrial revolution in last 100 years the time has come when the energy availability plays its role in all processes and services i.e. electrification, transportation, human comfort, communication , health services etc.. Thus the energy availability and the universal access of energy is essentially required for sustaining the civilization else humanity will roll back to stone age. World Energy Outlook ,2011 reports the estimate by International Energy Agency which says that around 1.3 billion people lack access to electricity and 2.7 billion people lack clean cooking facilities. These deficiencies can be met by the two pronged strategy of enhancing energy availability and facilitation of universal energy access. Statistics also indicate that the present global annual energy investment is 1.3 trillion US Dollar but in order to have sustainable energy for all the global annual energy investment needs to be increased to 1.8 trillion US Dollar. Also the past industrialization has led to climate change due to global warming, ozone layer depletion etc. Therefore, in order to have energy availability and universal access to energy the efforts should be made for sustainable future which also include due care for environment. The chronological energy transformation and future energy scenario is given in Fig.1. Graphical depiction also underlines the prominent role of efficiency leading to large scale demand reduction and large scale increase in contribution of renewable energy sources . The improvement in efficiency actually leads to avoiding the energy demand - 'Negawatts', which can act as key mechanism for meeting the future energy challenge to a reasonable extent. Statistics indicate that if the renewable energy contribution and rate of efficiency improvement is doubled then it will lead to 30% reduction in global energy demand and 60% reduction in green house gas emissions. Thus, the transformation to clean energy will eventually lead to well being of humanity through better health, energy security, new jobs, reducing poverty and revitalize economy.

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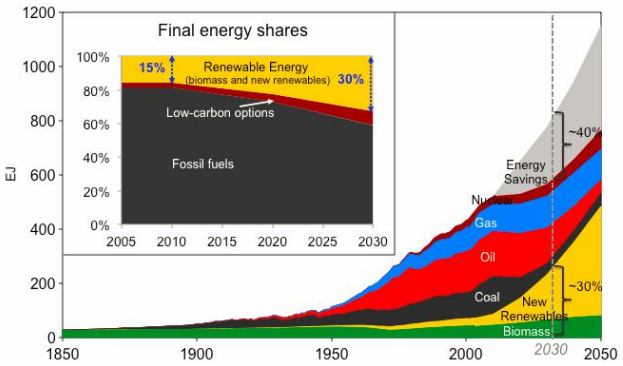

Fig. 1. Energy transformations and sustainable future energy scenario [Source: Global Energy Assessment- Toward Sustainable Future 2012, International Institute of Applied Systems Analysis, USA]

2. APPROACH FOR SUSTAINABLE FUTURE

Sustainable energy for all is a big challe nge and actually refers to the situati on in which there has to be 30% less consumption of energy for producing same products and services as of today. There is critical requirement of eliminating poverty, reducing gap between rich and poor along wi th minimizing adverse impact on climate which can be achieved through sustainable energy for all. Fo llowing three approaches can significantly help in sust ainable future.

a) To have Universal access to modern energy services
b) To double the global rate of i mprovement in energy efficiency
c) To double the share of renewable energy in the global energy mix

These approaches can be realiz ed through a robust coordinated framework with par ticipation of all stake holders in an open transparent and identifiable manner along with accountability.

Universal access to energy has capability of increasing human well being an d improving quality of life for poor along with econ omic development as it leads to availability of elect ricity for lighting and work applications leading to increa sed productivity, modern clean cooking options for clean environment etc.. Enhancing energy access will lead to improved productivity & quality of serv ices along with increased income which will automaticall y improve the state of civilization. Efforts in this direction should be integrated with the reduction in utilizin g limited non-renewable energy sources and increased u se of renewable energy resources.

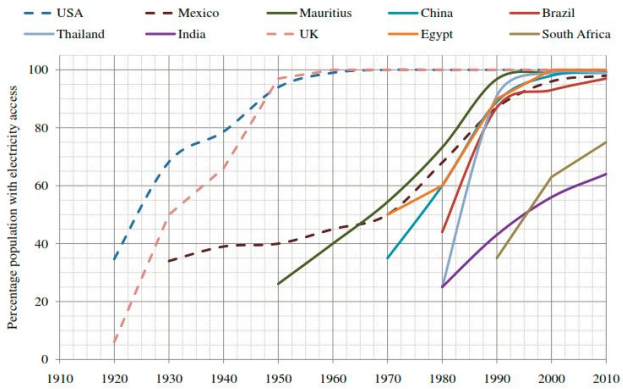

Fig. 2. Access to electricity in different countries [Global Energy Assessment]

Fig. 2. shows the state of access to energy in different countries. It indica tes that the universal access to energy although a herculean task has been accomplished by some countries. This agenda of ensuring universal access to e nergy will have different perspectives when looked on to different sectors such as access for industry, house hold, services etc. but some of the general ways as detailed below may help in realization of the obj ectives significantly.

- A broad, high level commitment by a country's political leadership to the objective of energy access.
- A realistic energy access strategy and clear implementation plans linked t o overall national development and budget process es.
- Strong communication campaigns to inform stakeholders of planned changes and related benefits.

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- Sufficient funding to support the delivery of energy services, from appropriate sources and at affordable rates.
- A robust financial sector, willing to lend to the energy sector and to provide end user financing.
- A legal and regulatory framework that encourages investment.
- The active promotion of project/business opportunities and a consistent flow of deals or transactions to attract a critical mass of private sector
- Processes to match actors around specific projects/proposals, particularly in public private partnerships.
- Energy access for community institutions
- The means to support successful small scale projects/solutions to reach larger scale.
- Robust and effective public utilities.
- Strong internal capacity potentially supported with external technical assistance.
- A deliberate effort to improve the availability of accurate and timely information.
- Reconciliation of regional and national interests in energy projects.

There shall also be the requirements of enabling environment for achieving the desired goals. Hence the Government has to play lead role in ;

a) Fostering a technology neutral systems approach within a climate conscious setting
b) Filling policy, capacity and funding gaps and delivering transformational change
c) Broad engagement and strong coordination with full disclosure and transparency

Thus it is obvious that for achieving universal energy access there should be efforts with full involvement and commitment of Government, realizing the requirement of the need for extensive public- private- people's participation, and a focussed response by donating Institutions, international organizations, society and others.

Public sector should facilitate and create an enabling environment through having smart policies to promote generation of renewable energy, energy efficiency, promote innovations by supporting new technologies and entrepreneurs, encourage private investment through suitable policies and incentives, support knowledge dissemination and use of public procurement to create market "pull" for energy efficiency and renewable energy technologies. Private sector should come forward and make investments in clean energy technologies, including through public/ private and innovative investment models, contribute expertise for creation and sharing of best practices for increasing energy efficiency and the use of renewable energy technologies.

With the concerted efforts for enhancing use of renewable energy resources and increasing energy efficiency the projected energy scenario for 2030 is shown in Fig.3.

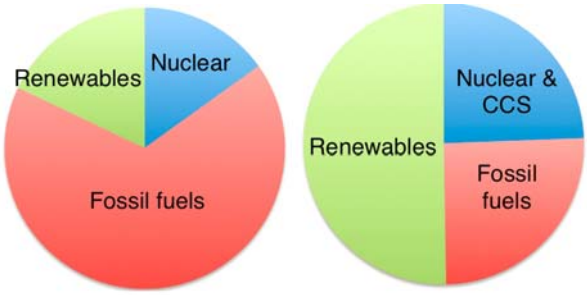

Fig. 3. Energy Scenario of 2005 and projections for 2030 [IEA, 2011.World Energy Outlook.Paris]

Fig. 4 shows the significant gain that can be had through improvement in energy efficiency in different sectors namely transportation, buildings and industry. Apart from having new sources of energy it is reasonably beneficial to go for efficiency improvement of existing power plants, monitoring and control of

existing industrial processes, design of energy efficient systems for all applications. Studies have shown that there occurs degeneration is performance of various energy producing and energy utilizing systems which needs to be regulated for optimal energy utilization.

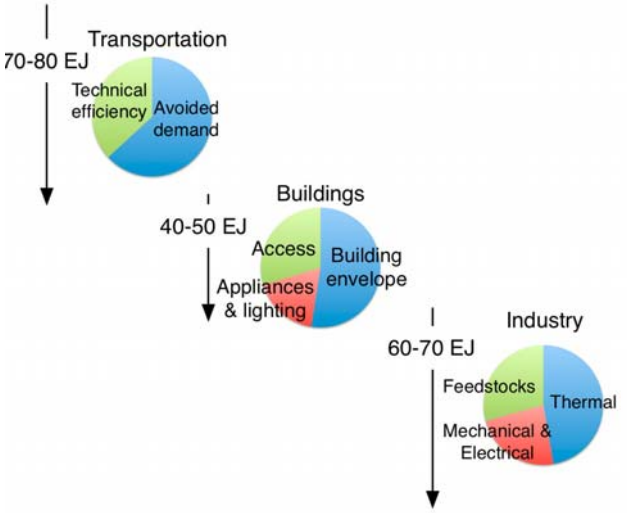

Fig. 4. Energy efficiency gains in different sectors [Source: IEA, 2011. Energy efficiency policy recommendations, Paris]

3. CONCLUSION

It is evident that the universal access to energy can not be achieved through some meticulously designed policies or technological innovations only rather these may continue to occur organically on their own, if there is commitment for improving energy economy through appropriate public sector decisions, private sector investments and the society acting as catalyst. Need is to have proactively catalysing actions by all stakeholders for high impact commitments in order to have sustainable energy for all by 2030. Government has to come forward with commensurate objectives & policies, achievable milestones and road map for energy security, energy access and clean energy transformations.

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