International Journal of Scientific & Engineering Research, Volume 4, Issue 5, May 2013

ISSN 2229-5518- JOURNAL PAPER FOR AIEAIE_E&T_240

Green Energy
Innovations - Integration & Adoption

Ms. Fathima Rifaa .P

Author

Student of Bachelor of Engineering

(Electronics & Communication Engineering)

Excel College of Technology, Komarapalayam, TamilNadu, India

mailto:fathimarifaa@gmail.com

Abstract— ***Green power refers specifically to electricity generated from a subset of renewable resources, including solar, wind, geothermal, biogas, biomass, and low-impact hydroelectric sources. Green Energy sources produce electricity with an environmental profile superior to conventional power technologies and produce no anthropogenic greenhouse gas emissions. Green Energy is reducing dependence on foreign sources and act as a stimulant for clean-energy companies paving the way for Protecting resources and reducing Global warming. Green Energy leads Innovation to Deployment through Comprehensive approach to innovation, Collaboration withPrivate Indusry.***

Key Words—Green energy, solar, wind, geothermal, biomass, global warming, electricity, innovation, integration, adoption, deployment

1) GREEN ENERGY

THE Term Green Energy is used in different ways. In the broadest sense, green Energy refers to environmentally preferable energy and energy technologies, both electric and thermal. This definition of Green-energy, include many types of power, from solar photovoltaic systems to wind turbines to fuel cells for automobiles. Green power refers specifically to electricity generated from a subset of renewable resources, including solar, wind, geothermal, biogas, biomass, and low-impact hydroelectric sources. These electricity sources are derived from natural resources that replenish themselves over short periods of time. Green Energy sources produce electricity with an environmental profile superior to conventional power technologies and produce no anthropogenic greenhouse gas emissions.

2) WHY CLEAN ENERGY?

Using clean, renewable energy is one of the most important actions you can take to reduce our impact on the environment. Electricity production is our #1 source of greenhouse gases, more than all of our driving and flying, combined, and clean energy also reduces harmful smog, toxic buildups in our air and water, and the impacts caused by coal mining and gas extraction.

International Journal of Scientific & Engineering Research Volume 4, Issue 5, May-2013

ISSN 2229-5518- JOURNAL PAPER FOR AIEAIE_E&T_240

3) CONCENTRATED SOLAR POWER TECHNOLOGIES

Concentrated solar power technology stands for both efficient and sustainable power generation.

1. Solar energy is concentrated by the mirrors to the receivers. Solar collectors track the sun in order to maximize the solar energy yield.
2.Heat transfer fluid is circulated and heated through the solar field loops. Cooled heat transfer fluid is returned and reused.
3. Pumps circulate the heat transfer fluid through the solar field.
4.Heat exchangers transfer the thermal energy from the heat transfer fluid system to the water steam cycle.
5. The water steam cycle transfers the thermal energy from the heat exchangers to the steam turbine.
6. The steam turbine converts thermal energy to electric power.
7. The cooling tower cools the water cycle.
8. Clean power is delivered to customers via the power grid.
9. Central control optimizes solar power plant.

4) TO WHOM DO CLEAN ENERGY TECHNOLOGIES BENEFIT?

Development and application of clean technology and renewable energy can offer organisations a variety of environmental, financial, stakeholder relations, economic development, and national security benefits.

5) Green Energy Imperatives

Reducing dependence on foreign sources

Stimulating clean- energy companies and growth

Protecting resources and reducing global warming

6) To-day's Green Energy System

• Dependent on non-domestic sources
• Subject to price volatility
• Increasingly vulnerable energy delivery systems
• 2/3 of source energy is wasted
• Significant carbon emissions
Role of electricity increasing

7) Future Green Energy System

• Carbon neutral
• Efficient
• Diverse supply options
• Sustainable use of natural resources
• Creates economic development
• Accessible, affordable

8) Innovation to Deployment

• Comprehensive approach to innovation
• Collaboration with private industry Connects science to the marketplace and Delivers market relevant technologies and competitive clean energy products

9) KEY CHALLENGES IN GREEN ENERGY SYSTEMS INTEGRATION

• Increase overall energy system efficiency
• Integrating new technologies in existing infrastructure
Engagement of consumers in energy use – increases complexity but also increases system flexibility.
Gaps in the ability to address these questions
• Difficult to test large-scale deployments of new technologies
• Difficult to obtain information on actual performance

10) GREEN ENERGYPOTENTIALS IN INDIA

Geothermal generation has a potential of 10,000 MW but there are no plants presently installed. The main factors restricting the development of this sector are the long gestation period and the lack of record for this technology in India. In India there is a demand of expertise for R&D in this field and scope also for Transfer of Technology.

11) TIDAL-ENERGY

Tidal energy has a potential of 9,000 MW, with site identified mainly in Gujarat and in the Ganges delta in West Bengal. There is no significant installation but the government of Gujarat has announced, in January 2011, a project of 50 MW that will be eventually the first commercial tidal project in India.

12 List of Companies, Research Organizations and NGO's

A) Solar Energy

National Physics Laboratory (NPL)
Physical sciences
Bharat Heavy Electricals Limited (BHEL)
Heavy electrical equipment industry
Department of Science and Technology (DST)
Science & technology
Indian Association for the Cultivation of Science (IACS)

B) Wind Energy

Centre for Wind Energy Technology (C-WET)
Wind energy
http://www.cwet.tn.nic.in

About the Author

Miss. Fathima Rifaa, F'93,

An aspiring Young Scientist pursuing II Year of B.E., Department of Electronics and Communication Engineering; EXCEL-College of Technology, Namakkal District, Tamil Nadu, India.PH: +91 999 447 8678

International Journal of Scientific & Engineering Research Volume 4, Issue 5, May-2013

ISSN 2229-5518- JOURNAL PAPER FOR AIEAIE_E&T_240

Wind turbine manufacturing
http://www.suzlon.com

RRB Energy Limited (RRBEL)
Wind power generation
http://www.rrbenergy.com
/
Bharat Heavy Electricals Limited (BHEL)
Heavy electrical equipment industry
http://www.bhel.com/

C) Small Hydro Energy

National Hydro Power Corporation (NHPC)
http://www.nhpc.co.in

Alternate Hydro Energy Centre (AHEC)
Small hydropower development
http://ahec.org.in

Jyoti Ltd.
Hydraulic engineering equipment
http://www.jyoti.com/

D) Biomass Power

Sardar Patel Renewable Energy Research Institute(SPRERI)
Research and development of renewable energy
http://www.spreri.org/

National Botanical Research Institute (NBRI)
Plant sciences
http://www.nbri.res.in/
Combustion gasification and Propulsion laboratory (CGPL)
Research and developmental activity in the field of bio-resource
http://www.nbri.res.in/

Radhe Renewable Energy Pvt. Ltd.
Biomass power production
http://www.radheenergy.com/

13 The Conclusion:

The World needs more Energy and it needs Cleaner, Low Carbon Energy. We have to move quickly in order to deliver concrete results in harnessing the Green Energy with Innovations, Integration and Adoption of Green Energy Technologies.

14 Acknowledgments

I am highly inspired by our Former President of India His Excellency Dr. APJ Abdul Kalam, who represents the Billion Hearts of India to the World of Science.

I am thankful to Most Respected His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and
Prime Minister of UAE and Ruler of Dubai, who has always been a great inspiration to me and who made me believe that “In the race for Excellence there is no finishing line” and also made me dream big by his words “The Time is limited, my dream is boundless” and inspired me to ask myself, “WHY NOT? ” to accomplish this Endeavour.

I am also thankful to Most Respected His Highness Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, the Crown Prince of Dubai who is my Role Model for being a person of Responsibility and Commitment.

I must not forget to thank my dear friend and sister,
Ms. Barbara Hüning, the Chairperson of SüdTaxen Lünen Inc., Germany, for all her constant supports and encouragements.

I thank the Department of EEE, Excel College of Engineering and Technology, and the Organizing Committee for having accepted my Paper and for permitting me to present the Paper in this fantastic NATIONAL CONFERENCE ON ADVANCEMENT AND INNOVATIONS IN ELECTRIC TECHNOLOGY & ALLIED SCIENCE IN ENGINEERING.

REFERENCES

[1] National Centre for PV Research and Education

[2] (NCPRE)

[3] PhotoVoltaic (PV) research

[4] http://www.ncpre.iitb.ac.in/

[5] NTPC Energy Technology Research Alliance

[6] (NETRA)

[7] Power generation

[8] http://www.ntpc.co.in/

[9] Solar Energy Centre (SEC)

[10] Solar Energy Society of India (SESI)

International Journal of Scientific & Engineering Research Volume 4, Issue 5, May-2013

ISSN 2229-5518- JOURNAL PAPER FOR AIEAIE_E&T_240

[11] www.irena.org

[12] www.masdar.ae