Future Aspects in Green Technology

Atul Singh[1], Dharmendra Pal[2]

Scholar, Department of Chemical Engineering, BBD National Institute of Technology & Managemnt, Lucknow
atulfreak@gmail.com
Assistant Professor, Department of Physics, BBD National Institute of Technology & Managemnt, Lucknow
paldharmendra78@gmail.com

Abstract: ***Green technology is a very wide-ranging term, one that covers all phases of life from computers to cars, using the advances in technology to make things more eco-friendly and lower our carbon footprint. In recent years, companies in the computer industry have come to realize that going green is in their best interest, both in terms of public relations and reduced costs. This paper presents at several green initiatives currently under way in the computer industry, Green computing represents a responsible way to address the issue of global warming. By adopting green computing practices, business leaders can contribute positively to environmental stewardship—and protect the environment while also reducing energy and paper costs.***

Keywords: Green Technology, Future aspects, eco friendly, Non renewable energy resources

1. INTRODUCTION

Any technology which provides the technique of energy production without harming or polluting the environment is termed as green technology. As the name implies green technology is one that has a green purpose, here green means any technology developed in order to support the nature by not polluting it. Green inventions are environment friendly inventions that often involve energy efficiency, renewable resources, recycling and more. Some common examples of the green technology are solar cell, wind mills & hydrogen fuel cells.

See, the world has limited amount of natural resources from which some has been completely depleted and some has on the era of their depletion so in order to protect them it is our urge is to use the green technology inventions. Green technologies not only provides conservation of natural resources but they also protect the environment from the degradation, due to it green house gas emissions will also be low .So, overall we can see the green technologies as the promoter of the usage of renewable resources.

Not from natural point of view but also from business point of view, green technologies serve as a boon. See it is clear that the green technology inventions are costly and for the initial set up of the green technical inventions requires great amount of capital investment and storage problems are also one of the major problems of the green technologies till date.

Already many inventions has been done in the field of green technologies and here I am going to discuss mainly the inventions in the field of green technologies like wind mills, solar panels & hydrogen fuel cells which are happened earlier to current year and then I will going to present my ideas in the further advancements in the field of green technologies related to these three green technologies to be apply in nearby future years for increasing the energy efficiency and to reduce the use of land by these advancements.

2. PREVIOUS RESEARCHES IN THE FIELD OF THE SOLAR TECHNOLOGIES WITHIN FEW YEARS

1. On August 18, 2014 david chandler gives a report on the research done by mit researchers in order to recycling old batteries into solar cells to minimize the lead pollution causing by these batteries.

2. On June 24, 2014 bill scanion of NREL presented a report on batteries with nanotubes which will last longer.

3. On June 18, 2014 sue holmes of sandia national labs presented a report on hoe the novel nanoparticle production method could lead to better solar cells.

4. On May 14, 2014 david chandler presented a report on the research by mit researchers finding the new material for flat semiconductors.

5. On May 6, 2014 chris goddard presented a report on the scientists method to reduce solar panel glare for its better efficiency.

6. On March 24, 2014 stephanie hobby of Sandia National Laboratory presented the report on clearing up cloudy understanding on solar plant output.

7. On February 25, 2014 john toon of Georgia institute of technology presented a report on solar-induced hybrid fuel cell electricity production directly from biomass.

ISBN: 978-81-93024-71-3

8. On November 27, 2013 bill scanion of NREL presented a report on how the solar panel moisture barrier can make better.

9. On November 11, 2013 bill scanion of NREL presented a report on the making of solar cells using heterojunction cells with transparent conductive oxides which lower the cost of fuel cell and increases its efficiency.

10. On September 16, 2014 stephanie holinka of sandia national labs presented a report on harnessing the suns energy with tiny particles.

11. On june 27, 2013 david chandler of mit presented a report on the research done by mit researchers on how the atom –thick photovoltaic sheets could pack hundreds of times more power per weight than conventional solar cells.

12. On May 2, 2013 mike ross of SLAC presented a report on how new battery design could help solar and wind energy power the grid.

13. On March 1, 2013 colin poitras of university of Connecticut presented a report on the uconn professor's patented technique key to new solar power technology.

14. On November 26, 2012 david l. chandler of mit presented a report on research done by mit researchers in order to funneling solar energy that is a new way to harness the sun.

15. On July 20, 2012 dr.sibylle orgeldinger presented a report on using plastic foils to make good efficiency solar panels.

16. On December 2, 2011 david l. chandler presented a report on the research done by mit students which gives a novel way to concenterate sun's heat by using photonic crystals.

17. On January 12, 2011 andrea siedsma of UCSD presented a report on how the UCSD engineers improved solar mapping.

18. On, November 8, 2010 karen mcnulty wash of brookhaven national lab presented a report on how a new material combines with elements for electri charge transport over large areas.

3. PREVIOUS RESEARCHES IN THE FIELD OF THE WIND TECHNOLOGIES WITHIN FEW YEARS

1. On January 7, 2014 david glickson of NREL presented a report on new test facility to improve wind turbines by using dynamometer testing.

2. On May 27, 2013 joel Scruggs of france presented a report on a recent study ids two compressed air energy storage methods and sites for the northwest.

3. On May 3, 2013 mit researchers searched a innovative storage system which could enable offshore wind farms to deliver power when it is needed as per report presented by the david chandler of mit.

4. On August 22, 2012 mark halper presented a report on the kite gen research in which kite power seeks high altitude power.

5. On May 21, 2012 bibiana bonmati, scientific editor of university of Barcelona presented a report on the research done by the faculty of physics which is a wind prospecting system designed to be used in marine environments.

6. On December 14, 2011 mike krapfl, science writer of lowa state university presented a report in research by the engineers on how hills, nearby turbines affect wind energy production.

7. On May 28, 2010 john r. weiner of Caltech presented a report on how wind farming can be done through vertical rotors inspite of propellars.

8. On April 9, 2010 claude r olsen of the the research council of Norway presented a report on how the companies along norways west coast are making the leap from offshore oil to offshore wind power.

9. Riso national laboratory for sustainable energy developed the smart wind turbines which can predict the wind, before it hit the blades by using the laser system according to a report presented on January 12, 2010.

10. On June 19, 2009 according to a report by the Carnegie institution for science in which the researchers assessed potential for wind in terms of "wind power density", which takes into account both wind speed and air density at different altitudes.

11. On May6, 2009 according to a report by emil venere, of purdue university which shows that how researchers have developed a technique that uses sensors and computational software to constantly monitor forces exerted on wind turbine blades, a step toward improving efficiency by adjusting for rapidly changing wind conditions.

12. On January 4, 2008 according to a report by Louis Bergeron and Stephanie kenitzer of Stanford university states the dispersing of wind farms to solve intermittence.

ISBN: 978-81-93024-71-3

4. PREVIOUS RESEARCHES IN THE FIELD OF HYDROGEN TECHNOLOGIES WITHIN FEW YEARS

1. On March 31, 2014 according to a report presented by the bill scanion of NREL, which states about the u.s. driving research on hudrogen fuel cells.

2. On August 15, 2013 according to a report by antoni szafranski of IPCPAS states about the electrochemical step towards better hydrogen storage.

3. On July 4, 2013 according to a report presented by mike janes of sandia national laboratories states about that how power for seaports may be the next job for hydrogen fuel cells.

4. On May 16, 2013 according to a report presented by jussi solin of technical research centre of finland which states about the joining of hydrogen to electricity in ending traffic pollution.

5. In 2012, university of Birmingham also done a frequent research on hydrogen and fuel cell.

6. On October 10, 2007 european commission take-up of hydrogen cars and the development of hydrogen technologies.

7. On April 18, 2011 a team of scientists at Lawrence Berkeley national laboratory, DOE, us have discovered a new material called air-stable magnesium nano composites which can help in storing hydrogen without complex methodology.

8. On June 29, 2010 a new process is being tested by chemical engineers of Purdue University to get high hydrogen production at fuel-cell temperature level with no catalyst use with the help of chemical ammonium borane (one of the solid materials with highest hydrogen content).

9. On August21, 2009 italy has come up eith worlds first hydrogen power plant.

10. On September10, 2009 according to a leading chemistry general angewandte chemie, makes a claim about recycling hydrogen containing fuel materials.

11. On April 22, 2009 researchers at the Weizmann institute organic chemistry department under the leadership of prof. david Milstein have develop a novel way of splitting water molecules that can separate oxygen from water and bind the atoms in different molecules.this techniques leaves the hydrogen free to combine in other compounded as well.

12. On May 25, 2009 bucher city cat H2 the worlds first municipality utility vehicle powered by fuel cells debut in basel, Switzerland.

13. On May 4, 2010 according to the doctoral student Karin willquist of applied microbiology at lund university developed a bacterium named caldicellulosiruptor saccharolyticus which nearly doubles the hydrogen gas production.

14. On March23, 2010 material scientists at the university of Wisconsin-madison have taken the help of piezoelectric effect to harness random energy available in the atmosphere to turn water into usable hydrogen fuel.

5. GOALS OF GREEN TECHNOLOGIES

The basic five goals of green technologies are as follows:

1. **SUSTAINABILITY**:- meeting present needs without compromising the ability of future generations to meet their own needs.

2. **SOURCE REDUCTION**:- reducing waste and pollution by changing patterns of production and consumption.

3. **"CRADLE TO CRADLE" DESIGN**:- by creating products that can be fully reclaimed or re-used.

4. **INNOVATION**:- developing alternatives to technologies that have been demonstrated to damage health and the environment.

5. **VIABILITY**:- speeding the implementation of green technologies and creating new carriers in the field of green technologies.

6. THE FUTURE OF GREEN TECHNOLOGY

- It is expected that in the coming years the use of green technology will extend into more areas.
- The future economic activities will depend on creating products that are safer and more beneficial to the environment.
- Creating awareness among people about the use of green energy and environmentally friendly products will improve the scope of this technology.
- There will be new career openings in the field of green technologies.
- The governments of various countries are recognizing the need for using green technology.
- The future economic activities will depend on creating products that are safer and more beneficial to the environment.

ISBN: 978-81-93024-71-3

7. NOW MY IDEAS IN ADVANCEMENTS OF GREEN TECHNOLOGIES WHICH CAN BE IMPLEMENTED IN NEAR BY FUTURE ARE(IDEA NO.1):

See as per seen most of the good researches in the field of green technologies especially using technologies like solar panels, hydrogen fuel cell& wind turbines to generate energy for fulfilling the energy need of human society, we have seen that really the researchers really left no stone unturned for generating electricity using these three of the green technologies.

See, as per i think that time has really come to use these green technologies in excessive way in order to stop the degradation of the environment.

Now what my idea in terms of advancements in green technology is that to create a green technical station in order to install these three green technologies there and by the interconnection of these three green technologies, we produce the electricity for the human society in order to fulfilling their basic needs.

See here I want to describe about a green technical station such as any thermal power station but instead of using non-renewable resources, we will use the renewable resources for generating energy in terms of electricity and then we will supply this electricity to a part of the human society in order to fulfill their energy needs.

Now in this green technical station we can use the combination of the three green technologies i.e. solar, wind & hydrogen fuel cell technologies in order to produce much more energy efficiency as compared to the normal solar power stations or to produce the good amount of efficient energy at lower capital cost as compared to the wind turbines arrangement stations, which produce very good efficient energy but at a very high capital cost price.

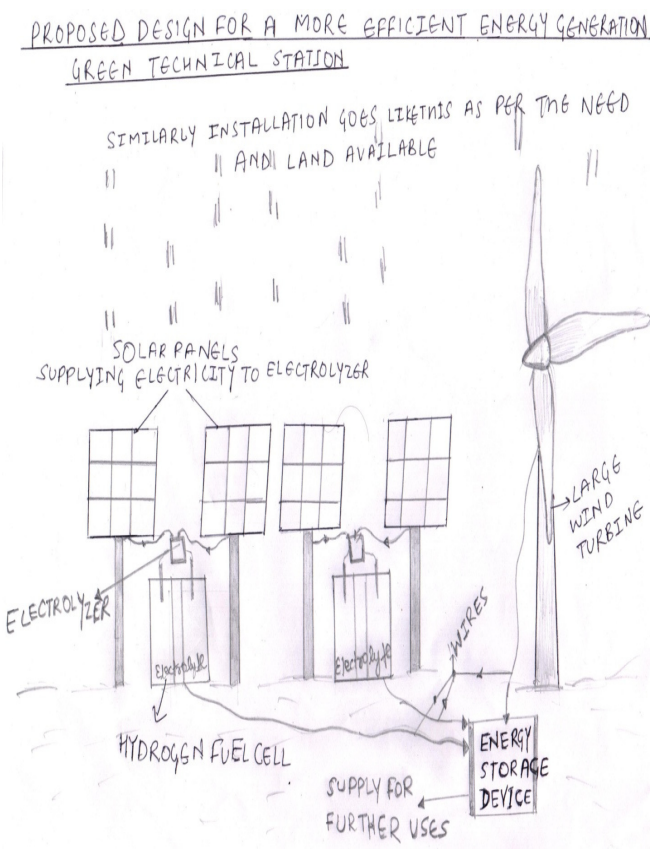
The first way of using them is like to set up the solar panels, few large size wind turbines and some hydrogen fuel cell technologies together in and then by using the energy from the solar panels to charge the electrolyzer(which is basically a improved lithium ion battery) and then with the help of this charged electrolyzer now the water inside the hydrogen fuel cell will breaks into the hydrogen and oxygen ions and after the recombination of these ions electric energy will going to produce from the hydrogen fuel cell . Now from the wind turbines installed in the proposed green technical station also efficient electrical energy will going to produce, now due to the coordination of hydrogen fuel cell and wind turbines the combined energy production will be going to very efficient with very less emission of pollutants and green house gases and now the energy will sent to the homes and places with the help of transmission lines.

Here the proper care is to be given for the fuel cells in terms of the fuel storage and fuel delivery in order for the better energy efficiency production from the proposed green technical station.

Now, here I also want to proposed the designing idea of using these three technologies in such a way such that within a limited amount of land we can produce more and more amount of energy.

See in the design given below I have installen the solar panels in upto a good height from the ground, and between the spaces between the solar panels I have installed the hydrogen fuel cells whose electrolyzers are connected through the solar panels and in my proposed green technical station I have also installed few of the large wind turbines which is less in number as compared to solar panels and hydrogen fuel cells and these wind turbines and hydrogen fuel cells, whatever the energy they generated get directly supply to the users via transmission cable wires for their further use the main advantage of this type of energy production is that-

1. Land saving is there in terms of use and cost both.
2. More energy efficiency is there.
3. The emission of environmental pollutant and green house gases is very less.



ISBN: 978-81-93024-71-3

8. NOW MY IDEAS IN ADVANCEMENTS OF GREEN TECHNOLOGIES WHICH CAN BE IMPLEMENTED IN NEAR BY FUTURE ARE(IDEA NO.2):

As from previous all the discussions we can easily say that it is not our need but it is our necessary duty to use most of the green technologies in our daily life to conserve not only the natural resources which are fast depleting but also for the betterment of our loving mother nature.

But as we know that the major challenge for the slow growth and implementation of the green technologies are its cost, less efficiency and its unreliability **.** See it is true that the initial set up for any green technology requires a good amount of money and other requirements, even some of the green technologies requires proper care also after the installation, but after installing all these green technologies really serves very well not in terms of overall profit, but also in terms of the betterment of the environment by reducing the emission of the green house gases and also by minimizing the degradation of the environment.

Now the general problem which is basically arises in any of the green technologies is the energy storage problem. See it is useless to produce a large amount of efficient energy if we do not have a proper medium to store it. A better energy storage medium provides high reliability to the green technologies, not only in terms of reliability but also in terms of the reducing costs it greatly helps the green technology users. With the help of a better energy storage system, the distribution of the electricity generating will also becomes easy and efficient and a large mass of the people of the world are also greatly benefitted by this.

Now, another problem which generally comes out during the installation of the green technologies is the land problem. As we seen at the various places that all the solar panel power station and the wind mill power station have two things in common, first one is their initial heavy capital cost and second thing is their need of a large land mass for the large amount of set up in order to produce efficient energy for the general use of the people.

As in the general scenario, capital cost and land cost both play a crucial role in the installation for these green technologies, so in order to protect the land area, I have proposed an idea(**This idea is basically for the countries like India, Bhutan, Nepal etc. Where only solar panel stations and wind turbine arrangement systems are there only and to those countries which are really having good amount of wind power potential for electricity production, as take the case of India, it has about 20, 000MW of wind power potential, out of which 1000MW has been installed as of 1997)** to make a green technical station in which there are many solar panels are going to install and few wind turbines or mills are also install and with the combination of both of these green technologies the energy which is going to be generated and the energy which will be generated must have a greater efficiency than the normal solar panel power stations and the wind turbines power station, so by this method we can easily save a greater amount of land area which were required previously for the energy generation, but as we all know that most of the good things have certain limitations also, same in this idea also . let it I will clear you this by describing that in this method of using solar power and wind power together initial cost of installation will really going to be high, but the efficiency of the power which will be generated by this will be much more than the normal solar power stations and more cost efficient than wind turbines arrangement systems. I am an Indian

and if I will try to put a light on my thought in terms of Indian expenses of the installing these two powers together or by interconnecting these powers with each other then it will going that in india a 1 sq. feet solar panel costs Rs. 4500/- which is a very good amount from the Indian point of view and a large single wind turbine costs Rs. 3.5-4.5 crores which is a very huge amount in terms of Indian point of view . See for the better production of the electricity the solar panel depends on large area because for more amount of energy the sources which are going to produce this energy should also be more so in order to save the land its better to use limited amount of solar panels with few of the wind turbines, which will not give better and efficient energy but it will also provide the land security and this process is really going to helpful for those countries which are going through or facing the problems like overpopulation which in turns also requires more land area for the people to live suitably so it will only achievable if we will try to use the existing land in a very prudent way because the land area is fixed for any country so we will have to use this property in a very judicious way.

See as per my idea has concerned then it will also take a very high initial cost to set up a green technical station having interconnection of solar power and wind energies together so what will do now:

There are only two options for us to implement this idea which are as follows-

1. Either government provide great amount of financial help in setting up of this idea because this idea not only protects the environment but it also conserves the land.

2. We need further researchs in terms of green technologies function so that it will be more energy efficient and less cost efficient which also takes a very long time and during this time environmental degradation will continuously goes on so what will we do-

Now for the second point implementation, I have also got a point that till the new technologies is going to be developed it is better to use it in few places to try to minimize the process of environmental degradation during the research period of time.

See, government members and people of each and every country have a need to understand that we will have to conserve the natural resources and the environment, because it is the root of the human life and after excess using it and contaminating the environment it will also going to difficult for the future human races to survive.

So inspite of having a drawback of high installing cost of this idea it is our need to use this idea in the near days.

9. PROBLEMS FACING BY THE GREEN TECHNOLOGIES:

1. **MASSIVE INITIAL FUNDING-** Any green technology requires a very good amount of initial funding for the proper set-up and care. So sometimes its high budget really comes as a obstruction in the path of its installation.

2. **CLIMATIC FACTORS-** The other common problem regarding green technology is its unreliability due to its dependeancy on climatic factors. Some green technologies like solar panels have got less effectivity during cloudy days and the efficiency of wind mills also goes down, if there is a lack of wind.

3. **CORPORATE PROBLEMS-** See the growth and demand of any new industries really affects the functioning and market demand of some other companies which can leads into conflicts among various industries.

4. **STORAGE PROBLEMS-** The storage problem has been seen in most of the green technologies especially in the hydrogen fuel cells. So for the better energy storage we have to use the affordable new technological improved lithium batteries and also to develop and research some more efficient storage devices. See a better energy storage device should be such that it not only gives higher reliability but can also lowers the cost.

Conclusion: (IMPLEMENTATION OF THIS IDEA IN TERMS OF INDUSTRIES):

See in many countries there are so many thermal power plants and production industrial units which requires a great amount of energy to run and they are fulfilling this need by using natural resources which are non- renewable like fossil fuels etc.. which provides a very efficient energy but having two very serious drawbacks and these two drawbacks are as follows:

1. Non-renewable natural resources are fast depleting so we have to 4conserve them.

2. Due to the burning of the non-renewable natural resources like fossil fuels, these factories releases very harmful gases in the atmosphere like harmful green house gases.

So we can easily see that due to the use of the non-renewable energy sources like them not only the naturally resources are continuously depleting but also the air or environmental pollution also occurs which are also harmful for the human society.

A great amount of water has been also polluted by this method which in turns result in the water pollution because wastes from the industries are directly put into the rivers, lakes etc which is not only dangerous to human life but it is also dangerous for the aquatic animals life also.

So now the idea of mine of using the solar and wind power technologies together requires a great installing urgency in these industries and power plants because it will not only provide them the efficient amount of energy in terms of eco-friendly energy generation for their proper running but also it conserves the natural resources, which are fast depleting now these days. It will also lower the emission of the green house gases and make the environment pollution free.

See the problem of high initial cost funding and energy storage will also be going to arise here. So, for the cost factor one has to take the help of the government and the government also has the need to understand the usage of the idea. Now in terms of storage problem we have to use the new technologies for making batteries, has to use the improved lithium ion batteries.

Government should also has the need to fully support and motivate the research and development departments of the industries.

REFERENCES

[1] www.deepgreenrobot.org
[2] www.green_technology.org/what.htm
[3] www.brighthub.com
[4] Whitney005.hubpages.com
[5] www.paragonind.com/sustainable_chem....
[6] www.americanelements.com/A green tec.....
[7] apexeco.com/what is green_technolog……..
[8] www.slideshare.net
[9] www.unapcaem.org
[10] tgeink.com
[11] www.greenbiz.com

ISBN: 978-81-93024-71-3

[12] mddb.apec.org
[13] www.birmingham.ac.uk
[14] Ec.europa.eu
[15] www.alternative_energy-news.info
[16] www.climatetechwiki.org/technology/
[17] www.greenenergynetwork.org/hydrogen
[18] www.altenrgySTOCKS.com/archieves/fuelcell
[19] www.renewableenergyworld.com
[20] www.technologyreview.com/featuredstory/411023/sun_water_fuel
[21] e360.yale.edu/feature/the_challenge_for_green_energy …/2170/
[22] An article written by the expert anna Schwartz miller
[23] Through Wikipedia
[24] An online international journal available at http://www.cibtech.org/jgee.htm 2012 vol.2(2) may-august, pp.121-128/ Maurya et al .

ISBN: 978-81-93024-71-3