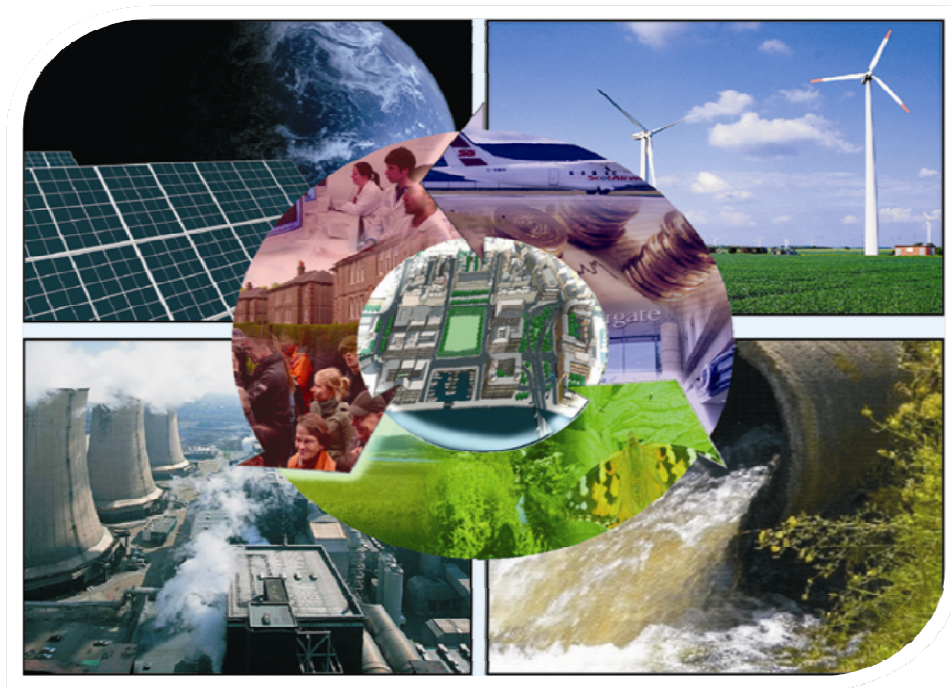


EESD 2009

1st International Conference on
**Energy, Environment, and Sustainable Development
for Growing Economies**
(EESD2009), May 04 – 06, 2009

Conference Report



Organized by:

Institute of Environmental Engineering and Management, Department of Chemical Engineering,
Department of Civil Engineering, Department of Electrical Engineering,
Department of Mechanical Engineering, Institute of Petroleum & Natural Gas Engineering

In collaboration with:

Higher Education Commission Pakistan



Rizvi &
Company



PCM
Karachi

SITE Ltd.
Sindh.

Background

The energy scarcity became one of the major issues in the world in addition to the environmental concerns over the last few decades. These issues became more serious for the energy deficient growing economies having insufficient resources to cater the environmental pollution. The rapid economic and population growth further aggravated the situation. The escalating prices of petroleum products have not only affected the economic growth but also the common man. Keeping in view the importance of the issue, the UN had incorporated Energy and Environment in its Millennium Development Goals (MDGs). It is the need of the time that all the nations jointly take an action to address the issues more seriously than before.

“Escalating prices of petroleum have not only affected economic growth but also common man”

The Mehran University of Engineering and Technology in collaboration with Higher Education Commission has organized 1st International Conference on “Energy, Environment and Sustainable Development for Growing Economies (EESD2009)”. The

conference has provided a platform to the experts from all over the world to present their research work and share their expertise with academia, researchers, stakeholders, policy makers and etc. The experts discussed the possibilities of managing the energy crisis and protecting the environment sustainably.



More than 100 papers were received from various countries i.e. UK, China, Indonesia, Malaysia, Bangladesh, Nepal, Italy, France, Palestine, Iran, South Korea and also from various parts of Pakistan. All

papers were reviewed and only 68 papers were accepted for oral presentation in the conference on the themes:

- Energy Conservation and Management,
- Environmental Engineering and Management,
- Renewable and Emerging Energy Systems,
- Waste Treatment and Management,
- Biological and Chemical Treatment of Waste, and
- Energy and Environmental Sustainability.

Participants came from UK, China, Bangladesh, and Palestine and also from various universities and government organizations of Pakistan i.e. MUET Jamshoro, QUEST Nawabshah, NED

Karachi, QAU Islamabad, AKU Karachi, University of Sindh, University of Karachi, SAU Tando Jam, LUMHS Jamshoro, COMSATS Lahore, Fatima Jinnah University Rawalpindi, Baluchistan University Quetta, PIEAS Islamabad, IEP Karachi, Sindh Environmental Protection Agency, Ministry of Environment and Alternative Energy, Sindh, HDA, SIDA, SITE Ltd., WASA, NPO, KANUPP, AKUEB, and PCSIR, also from various NGOs i.e. AWARE, Caritas Pakistan, SSEWA Pak, INN, PVDP, SRSP, and PYDN. The EESD2009 was widely covered by electronic & print media. GEO News, ARY OneWorld, DAWN News, Aaj TV, Express News, Dhoom TV, Sindh TV & other TV channel had covered the conference for the three days. The major daily Dawn, Jang, The news & other national & local news papers had given detailed reports for the proceedings of the conference.

Inauguration

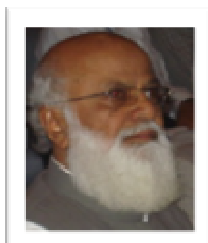
The conference was inaugurated by Prof. Dr. Atta Ur Rehman, *former Federal Minister for Science and Technology and Chairman Higher Education Commission, Pakistan* on 4th May, 2009. The other dignitaries Dr. A.Q.K. Rajput, Vice Chancellor, MUET, Dr. Wahid Bux Soomro, Vice Chancellor, QUEST, Dr. M. Rafique Abro, Pro- Vice Chancellor, Deans of Faculties; Dr. Riaz A. Sohag, Dr. A. Karim Baloch, Dr. M. Ibrahim Panhwar, Dr. Dost Ali Khuwaja, the Academic Heads of all the department of MUET and Sindh University, keynote speakers, authors, overseas & national delegates and representatives of sponsors Mr. Qasim Soomro – KATI, Mr. Ashfaq Lagari – JJVL, PCM, SITE Ltd, HBL, ABL, Bank Al-Habib, PSF, Rizvi & Associates have participated in the inauguration ceremony. The conference started with the recitation from Holy Quran by Hafiz Abdul Aziz, lecturer, Islamic Studies and Ms. Qurat al Ain Mirza, (ELDC, MUET) was the announcer of the event.

Prof. Dr. Abdul Qadeer Rajput, *Vice Chancellor, Mehran University of Engineering and Technology,*



Jamshoro, Pakistan, in his address said that MUET is one of the leading engineering universities in Pakistan. The university is determined to achieve academic excellence in every discipline studied at the university ranging from undergraduate to Ph. D level. He informed the participants that this could be seen by the achievements made of the university in the past few years. The university had signed MOUs with high ranked universities in USA, Australia, UK, Thailand and many

other countries to collaborate in higher education and research. Dr. Rajput appreciated the participation of a large number of experts from different parts of the world in the conference, indicating the anxiety of the crux of international science and reaches communities in hoping to think together about strategies and technologies for sustainable development in the world in general and in Pakistan particular.



Prof. Dr. Muhammad Rafique Abro, *Pro Vice Chancellor, Mehran University of Engineering and Technology, Jamshoro, Pakistan*, welcomed all the participants, the national and international speakers arriving from UK, China, Bangladesh and other parts of Pakistan.

Overview

Prof. Dr. Muhammad Aslam Uqaili from Department of Electrical Engineering, Mehran University of Engineering and Technology, Jamshoro, Pakistan, gave an overview of the conference. Defining the sustainable development that, “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. There is an intimate connection between energy, the environment and sustainable development. Energy related and other environmental concerns such as global warming, air pollution, ozone depletion, forest destruction, emission of radioactive substances, land degradation, water pollution, noise pollution etc are



important factors in sustainable development. Energy is directly associated with all three aspects of sustainable development—economy, environment, and social welfare. He warned that the fossil fuels are may likely be available for coming few decades, yet by all odds they are not a sustainable source of energy.

Realizing the importance of these issues, the International Conference on Energy, Environment and Sustainable Development for Growing Economies was organized by Mehran University.

The conference has provided a platform to the experts from all over the world to present their work and share their expertise with academia, researchers, stakeholders, policy makers and etc. We remained successful in getting response from public and private sector universities, research organizations, stake holders and industries from all over the world in the field of Energy, Environment and Sustainable Development.

He also invited the participants to field trip and sight seeing on the third day of the conference to the first wind farm of Pakistan (Zorlu Enerji Wind Farm) at Jhampir installed by Turkish Company, Zorlu Enerji pvt Ltd about 80 km from Jamshoro and to Keenjhar (Kalri) lake, one of the largest fresh water reservoir of Pakistan supplying water to Karachi.

Prof. Dr. Muhammad Aslam Uqaili announced the establishment of a Multi-disciplinary Research Group “Energy and Environment Engineering Research Group” (EEERG) at MUET, Jamshoro. He also invited the participants to the second international conference on the same theme by November 2010 at Mehran University, Jamshoro, Pakistan.

“Fossil fuels are likely to be available for coming few decades, yet by all odds they are not a sustainable source of energy”

Keynote Speeches

Prof. Dr. Atta Ur Rehman gave his presentation on the Higher Education, Science &



Technology - Striving for Excellence! He said that, Socio-economic development is no longer dependent on natural resources (e.g. Japan, European countries). Knowledge is the main driving force of world economies, and the basis of socio-economic development and industrialization key to high GDP growth. He emphasized the higher engineering education saying that the universities are the backbone for national development; Pakistani engineering universities were really low level “colleges”, which need to be given first priority.

He appreciated the efforts undertaken by the conference organizers to gather such a gala of the researchers under one roof and to think for a combined theme and issues having global importance.

Prof. Dr. B. K. Bala, Professor at Bangladesh Agricultural University, Mymensingh, Bangladesh delivered his



keynote speech on the energy, environment and sustainability. He said that energy is needed to meet the subsistence requirements and economic development and per capita consumption of electrical energy is a measure of physical quality of life development. He also warned that energy production and use is a major source of serious environmental impacts. At regional and global levels, fossil fuel consumption leads to acid rain, and most likely to global warming; both phenomena

could disrupt normal system and economic productivity.

At the local level, continued reliance on traditional biomass fuels would result environmental degradation, local air pollution especially from transport sector and industries. Sustainability is meeting the needs of current and future generations through integration of environmental protection, social advancement and economic prosperity. The indicators of the sustainability are economic indicator, social indicator and ecological indicator.

Prof. Dr. Nie Yongfeng from Department of Environmental Sciences and Engineering, Tsinghua University,



China delivered his keynote speech on the Development of Solid Waste Management in China. He reported the state of art development stages of Municipal Solid Waste (MSW) management system from early 1970 to date. He described various MSW management technologies and their merits and demerits. He emphasized that decision makers should employ/adopt MSW management technology carefully otherwise all resources will go waste. Prof. Nie is also patent of Incineration technology and he developed the hybrid system of pyrolysis and gasification to recover the refused derive fuel (RDF)

and gas from the waste. He said that this technology is being used to treat the hazardous waste

and MSW for energy recovery purposes. He reported that China is recovering the landfill gas from the landfills and utilizing for electricity generation, leachate treatment and also converting it to CNG.

Engr. Shah Zulfuqar Haider, PEng,



Mymensingh Rural
Electric Society-2,
Bangladesh,
delivered his
keynote speech on
“Tariff – Its
Importance for
Sustainability of
Power Sector”. He

said that for the sustainability of power sector should run on No-Loss No-Profit, Sound financial basis & lowest cost, tariffs rationalized, revenue from consumer - main Income, all new extension on revenue criteria. He suggested that for sustainability of the power sector:

- The cost of electricity up to consumer should be minimum
- Use Superior quality products
- Reward and Punishment
- Power Factor improvement
- Load & Demand Side Management
- Reduction of losses
- Consumer education
- Pilferage proof good quality meters

Prof. Dr. Khan Muhammad Brohi,
Director Institute of Environmental
Engineering and



Management,

Convenor of EESD 2009, thanked all the participants for their active participation in the conference. He also thanked the volunteers for their day and night work to make this conference successful. He also thanked the sponsors of the EESD 2009, especially the Higher Education Commission, Islamabad and hoped that sponsors will continue to support the conference organizers to organize the events of international level in the future as well.

Keynote Speakers of Technical Sessions

Environmental Engineering & Management (Session I-A)

Engr. Naseer A. Memon, LEAD Pakistan

Dr. Tauseef Lateef, The Aga Khan University-Examination Board, Karachi, Pakistan

Prof. Dr. Khan Muhammad Brohi, Institute of Environmental Engineering and Management, MUET, Jamshoro, Pakistan

Energy Management & Conservation (Session I-B)

Dr. Musarrat Jabeen, International Relations, University of Baluchistan, Quetta, Pakistan

Prof. Mushtaque Mirani, Department. Of Electrical Engineering, MUET, Jamshoro

Engr. Shah Zulfuqar Haider, Mymensingh Rural Electric Society-2, Mymensingh, Bangladesh

Renewable and Emerging Energy Systems (Session II-A)

Engr. Asad Mehmood, NPO, Islamabad, Pakistan

Prof. Dr. B. K. Bala, Bangladesh Agricultural University, Mymensingh, Bangladesh

Waste Treatment & Management (Session II-B, & III-B)

Dr. Nie Yongfeng, Tsinghua University, Beijing, China

Dr. Rasool Bux Mahar, Department of Civil Engineering, MUET, Jamshoro

Dr. A.J. Leghari, Chemistry Department, University of Sindh

Energy and Environmental Sustainability (Session III-A)

Prof. Dr. Susan Buckingham, Brunel University, UK

Prof. Dr. B. K. Bala, Bangladesh Agricultural University, Mymensingh, Bangladesh

Prof. Dr. Abdul Khaliq Ansari, MUET, Jamshoro, Pakistan

Environmental Engineering & Management (Session IV-B)

Dr. Ahmad Hussain, KANUPP, Karachi, Pakistan

Mr. Aqeel Ahmed Bazmi, COMSATS, Lahore, Pakistan

Chemical & Biological Treatment of Waste (Session IV-A)

Dr. Mukhtar-ul-Hassan, Brunel University, UK

Dr. Asma Jabeen, F J W University, Rawalpindi, Pakistan

Technical Sessions

About 68 papers were scheduled to be presented orally over eight back to back sessions on first two days of the conference. The sessions were divided according to the theme of the papers. Twenty two papers were presented in Environmental Engineering & Management, 7 in the Energy Management & Conservation, 8 in Renewable and Emerging Energy Systems, 15 in Waste Treatment & Management, 8 in Energy and Environmental Sustainability, and 8 papers were presented in the Chemical & Biological Treatment session.

The keynote speakers and authors who presented their work in EESD2009 were Prof. Susan



Buckingham, UK, Dr. Mukhtiar ul Hasan, UK, Dr. Nie Yongfeng, China, Dr. B.K.Bala, Bangladesh, Engr. Shah Zulfqar Haider, Bangladesh, Dr. Musarrat Jabeen, Quetta, Dr. Asma Jabeen, Rawalpindi, Dr. Ahmed Hussain, KANUPP, Mr. Aqeel Bazmi, COMSATS Lahore, Mr. Naseer Memon, LEAD Pakistan, Mr. Asad Mehmood, NPO Islamabad, Dr. Tauseef Lateef, Agha Khan Education Board, Ms. Razia Begum, PCSIR Laboratories, Dr. A.J. Laghari, University of Sindh, Dr. Hanif Memon, Dr. Khan M. Brohi, MUET, Dr. Khanji Harijan, MUET, Dr. Mukhtiar A. Mahar, Mr. M. Hayat Jokhio, Mr. Dur. M.

Pathan, Dr. A.K. Ansari, MUET, Ms. Zeenat M. Ali, MUET, Dr. A.J. Laghari, Sindh University, Ms. Shaheen Aziz, MUET, Mr. Suhail A. Soomro, MUET, Prof. A. Rasheed Memon, MUET, Mr. Imran Nazir, MUET, Mr. Aitibar Abbasi, MUET, Mr. M. Yasir, MUET, Mr. Gordhan Valasai, Mr. Hossam Adel Zaqoot, Mr. Zeeshan Khatri, MUET, Mr. Shamshad Ali, MUET, and Raza Haider Leghari, MUET.



Each technical session was chaired by renowned researchers assisted by the secretary of the session. Among those were Dr. M.Y. Khuhawar, Prof. Susan Buckingham, Dr. M. Aslam Uqaili, Dr. A.K. Ansari, Dr. Saleem Raza Samoo, Dr. Ahmad Hussain, Dr. Hafeez ur Rehman Memon, Dr. B.K. Bala, Dr. Nie Yongfeng, Dr. Mukhtiar ul Hasan, Engr. Shah Zulfqar Haider, Dr. Khan M. Brohi, Dr. R.B. Mahar, Prof. Mushtaque Mirani, Engr. Kishanchand Makwana, Engr. Suhail A. Soomro, and Dr. Khanji Harijan.



The conference was attended by more than 500 authors & delegates from overseas & from all over Pakistan.

Concluding Ceremony

In the concluding ceremony, the Chief Guest was Mr. Askri Taqvi, Minister for Environment & Alternative Energy, Government of Sindh.

The respectful dignitaries attended the concluding ceremony were Dr. A.Q.K. Rajput, VC, Dr. Wahid Bux Soomro, VC, QUEST, Dr. M. Rafique Abro, Pro-VC, Deans; Dr. Riaz A. Sohag, Dr. A. Karim Baloch, Dr. M. Ibrahim Panhwar, Dr. Dost Ali Khuwaja, the Directors & Chairman of all the department of MUET, Ms. Seema Khan, Ms. Nida Dossa, British Council, overseas & national delegates and representatives of sponsors Mr. Ashfaq Lagari, JJVL, and ABL. Ms. Sabeen Qureshi and Ms. Sahiba were the announcers for the concluding ceremony.



The concluding ceremony started with the recitation from Holy Quran by Hafiz Abdul Aziz, lecturer, Islamic Studies, MUET, Jamshoro.

The Vice Chancellor, Prof. Dr. A.Q.K. Rajput welcomed the Chief Guest & the all the delegates from UK, China, Bangladesh & from all over Pakistan. The Vice Chancellor said that the Mehran University is one of the leading Engineering Universities of Pakistan. He said that the university is not only fulfilling the higher education needs of the province of Sindh but also aware of the current international developments in science & technology. The university is regularly arranging international conferences where experts present their work.

In the concluding ceremony, “Hayat-e-Nou” an NGO, presented a tableau on environmental awareness among the people. Audience appreciated the children’s performance. The children presented themselves as trees, air, and birds. They also presented the hazards made by the usage of plastic bags in the society. They sung a song, requesting people for lesser usage of plastic bags, stop burning of plastic bags and waste and keeping the environment clean.



Mr. Askri Taqvi, Chief Guest, and the Minister for Environment & Alternative Energy, Government of Sindh



called for the joint efforts to save environment from hazardous impact of residential and industrial waste. He said energy and environment were major concerns of all the nations, specially the underdeveloped countries. Air and water quality deterioration was very serious environmental issue that people were facing. Gas emissions from industries, sea water intrusion and indiscriminate disposal of domestic and industrial waste water into fresh water bodies had caused degradation of wetlands, rivers, and lakes, he added.

The minister appreciated the efforts of the organizers for holding a purposeful international conference on very important issues. He emphasized the role of all and sundry for ensuring better environment in the country. He expressed the hope that the papers presented in the technical

sessions of the conference would be beneficial for our future planning and policy making of the government.

Ms. Susan Buckingham, *Professor at Centre for Human Geography, Brunel University, UK*, said in her keynote speech that, Energy decisions must take place in the context of effective environmental and social impact assessment, as well as long term economic assessment. She illustrated the importance of taking a gender perspective in making decisions about planning for sustainable development. Drawing on international examples, she discussed the importance of involving more women in decision making on sustainable development, including energy. As well as being an equal opportunities strategy in itself, gender balanced decision making is becoming increasingly recognized as producing better, more creative, decisions.



Prof. Dr Rasool Bux Mahar, *Department of Civil Engineering, MUET, Jamshoro* presented a detailed report and the recommendations made by speakers and participants of the three-day international conference, EESD 2009. He emphasize about creating awareness in the public about energy conservation and environmental pollution. He urged the governments that the academicians should be involved in policy making and planning. Dr. R. B. Mahar also recommended that the R & D in the educational and other research institutes should be supported.



Engr. Suhail A. Soomro, *Organizing Secretary of EESD 2009, & Coordinator, HEC-BC Waste Treatment & Management link program* thanked Mr. Askri Taqvi, for sparing his valuable time to grace the occasion of the concluding ceremony. He paid gratitude to the international & national participants for attending and presenting their research work. He praised the untiring efforts taken by the members of the various organizing committees & dedicated student volunteers for organizing this successful event. He appreciated the commitment & interest shown by the sponsors for supporting the cause of higher education & research. He encouraged the participants to participate the 2nd International Conference (EESD 2010) at Mehran University, Jamshoro, Pakistan in 2010. He hoped that the sponsors would show the same enthusiasm & commitment during EESD2010.



Field Trip & Sight Seeing

After two days of the technical sessions, a dinner and light musical show was arranged for the participants on the lawns of Mehran University Auditorium. Famous folk singer Tameer Hussain entertained the audience with his melodious voice. One of the participants from Bangladesh Ms. Zahida Alam presented two Ghazals of Rabindar Nath Tagore and applauded heavily by the audience. The musical night converted into fun time when Dr. Brohi had some dance on the stage, whole the auditorium clapped heavily for Dr. Brohi. On the third day of the conference, the participants of the conference visited the Zorlu Enerji Wind Farm, where the Turkish Company Zorlu Enerji PVT Ltd has installed first wind farm in Pakistan near Jhampir, about 80 km from Jamshoro.

Geographically, it is located in the wind corridors, coastal area of Sindh. The total capacity of the wind farm is 50MW. 04 Wind Turbines of 1.2 MW each have been installed. The wind farm was inaugurated by the Prime Minister of Pakistan, Syed Yousaf Raza Gilani on April 19, 2009.

After visiting the Zorlu Enerji Wind Farm, the conference participants visited Keenjhar (Kalri) lake is the one of the largest fresh water lake of Pakistan, supplying water to Karachi, situated at about 90 km from Jamshoro. Legend love story, Noori Jam



Tamachi took place near the lake and grave of the Noori is in the center of the lake. In winter season, the lake is one of the major resorts for the migratory birds from Siberia.

During the conference evenings the foreign participants and national delegates kept themselves busy in shopping and visiting some historical places like Qadam Gah Maula Ali, Sindhology Museum, Pakko Qillo, Eid Gaah,

Tomb of Mian Sarfaraz Kalhoro, Sindh Museum, Rani Bagh, and Kotri Barrage.

Energy & Environment Engineering Research Group

Website: <http://www.muett.edu.pk/eeerg>

Location: Mehran University of Engineering & Technology, Jamshoro, Pakistan

- **Dr. Muhammad Aslam Uqaili**

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Members of Energy & Environment Engineering Research Group at Mehran University Jamshoro

From left to right: Engr. Suhail A. Soomro, Dr. Muhammad Aslam Uqaili, Dr. Khan Muhammad Brohi, Dr. Khanji Harijan, Engr. Gordhan Valasai, Dr. Mujeeb uddin Memon, Dr. Rasool Bux Mahar, Dr. Hafeez Ur Rahman Memon

Recommendations

As a result of the 1st International Conference on Energy, Environment, and Sustainable Development for Growing Economies (EESD2009), arranged from 04 – 06 May, 2009, following recommendations were made by the participants and speakers of the conference:

- Energy system should be transitioned from non-sustainable to sustainable energy sources.
- The collaboration of public-private partnership is crucial to the development of renewable energy technologies. Private sector should be invited and encouraged to invest in the renewable energy development.
- Indigenous renewable energy sources like solar energy (power generation, water pumping, cooking and heating, drying of agricultural products etc.) wind power, hydropower, biomass, bio-fuels etc should be developed to substitute oil and gas and enhance energy security.
- Energy saving plans should be implemented to manage the gap between supply and demand. Economic analysis of power shortages should be done and tariff should be prepared.
- Indigenous energy resources should be developed and utilized properly, i.e. coal with clean coal technologies for power generation, industrial processing heat, and coal gasification as a substitute to natural gas.
- Natural gas should be utilized in the domestic, commercial, transport and fertilizer sector only. Its use in the power generation sector should be minimized.
- Import of oil should be minimized by substituting it with CNG, bio-diesel, ethanol in the transport sector and coal, wind power, solar energy and hydropower in the power generation and industrial sector.

- The technologies for utilization of coal, biomass, wind power and solar energy should be developed locally to minimize the costs.
- MSW should be managed properly by using land-filling, incineration and composting technologies and dumping sites should be rehabilitated through appropriate methods.
- Landfill gas (LFG) should be recovered from bio-reactor landfill and from the incineration process for power generation and heat recovery.
- Women should be involved in the energy & environmental decision making.
- Illegal and improper disposal of largely untreated municipal and industrial waste water in the fresh water reserves should be stopped.
- All the industries should install waste treatment plants.
- Wastage of water must be stopped in irrigation and urban areas.
- NEQs should be implemented to control air, water, land and noise pollution.
- Environmental tribunals should be established to implement the environmental laws.
- Centers of excellence for energy and environment should be established in every university and research institutes. All the universities should start programs in the energy and environment at under-graduate and post-graduate level.
- Policies should be made for efficiency improvement and conservation of energy for management of the energy sector.
- Awareness about energy applications, their environmental impacts and socio-economical benefits should be created.
- Academicians should be involved in policy making and planning.
- R & D in the educational and other research institutes should be supported.
- Investors should be facilitated to invest in the energy and environmental sector.