

## Environmental Trends in Energy Sector

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**Abstract:** Important environmental issues related to energy, to order and command that is of high priority, not only in attempting to solve problems, but it acts the way from the perspective of economic and energy systems is best considered as an urgent challenge be. building societies to resolve environmental problems and avoid creating it, have a growing awareness. Among the environmentally destructive activities, a significant contribution to the energy sector accounts is because the environmental impact of this sector is enormous. Operating supplies and energy security, prevention of environmental degradation that could potentially result of energy use comes around. This article is based on this foundation that coordination, the same pace and energy and environmental goals, is the ultimate goal.

**Key word:** Energy, Environment, Efficiency, Electricity, Fuel

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### *Relations and Environmental Impacts of Energy Security:*

Results of environmental activities is extensive, but the energy systems that are related by governments and industry to prevent, minimize, control or maintain such effects have been founded. Environmental actions through consideration of some environmental costs on energy activities has affected. This pattern in turn, supply and demand of energy to a very relaxed and subtle has changed. When the more comprehensive environmental relationships and are more accurate, environmental aspects of energy activities (prevention, control, etc.) in an increasing share of overall investment performance and expenses will be. Environmental and safety measures (especially in countries where energy from coal or nuclear energy for electricity use) a significant impact on total production costs have left. Note, all tests necessary environmental impact of policies is used.

### *2. Decision Model for Energy and Environment:*

The purpose of analysis, measures that can be produced by the energy required with minimal effect on the environment, energy security, lowest cost and maximum have. The analysis should present situation, trends, technical and economic measures can industries, consumers and governments pay attention. This includes evaluation of costs and benefits, issues and restrictions with which the positive aspects, and if there are negative aspects as well as mutual economic factors faced by each of these factors can accelerate the process of the desired changes or to that. Factors that are evaluated include application functionality political tool, its effect, special restrictions, micro and macroeconomic effects and the political fence, and consumer behavior characteristics.

### *3 . Increase Energy Efficiency:*

Any action to increase energy efficiency including energy saving measures to be applied by a producer or consumer of energy is taken to reduce energy losses. So can be found through upgrading hardware (technology) and software sector (to improve energy management and ...) was to increase efficiency. Increasing energy efficiency, environmental impact reduces the energy. When about the necessity of pollution control are spoken in the energy sector, the need for support in response to rising energy prices, increased understanding of prices, energy scarcity, especially with the help of technology innovation, has been done.

Most countries in the industrial sector to increase energy efficiency achieved are impressive. Problems and barriers in the industrial sector include lack of information and capital, contradictions in priorities, understand the risks, the desire to avoid failure and more. The most promising potential in the continuing integration of new equipment with more efficient is where the change in the production process is emerging. Successes and limitations placed industry. Combining the best potential in energy efficiency in new structures and equipment

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used in industry, changes in procedures and performance habits. Existing limits and boundaries to achieve the potential remaining the same limits and boundaries in the industrial sector but with different dimensions. Government intervention into pricing policies and assessment tasks, training and informing, stimulating and regulations imposed on access to electricity is more efficient for the consumer is effectively the final gun. In this regard, the legal framework developed to provide economic stimulus to encourage increased efficiency of energy end use, especially when the overall benefit of such measures is the efficiency of the system is paramount.

#### **4. Transforming power:**

Transforming power in containing the size and amount of losses caused by electricity conversion, increasing energy conversion efficiency of fully relaxed, but that is ongoing. Advantage business in the Minor in these systems is that it's so stimulating enough for users to track the best performance and build new systems and more efficient there. This prospect is that somehow the relative size of the likely continued increase in energy intensity of OECD economies, but only increases the success probability of achieving the energy efficiency there. Energy losses must be stopped or reduced slowly. The most likely short-term goal for political action to change the electricity sector should aim at encouraging the technological improvements, such as this strengthen production facilities more efficient and clean energy technologies instead of useful life (just use an older facility and performance gives a less extent) be done.

#### **5. Performance Vehicles:**

where the fuel consumption in the transportation sector heavily in 1973 and 1987 in OECD countries increased efficiency of vehicles is very important. The results suggest that the greatest increase in fuel efficiency of cars by improving existing technologies has been made. But the pattern of change driving the process of buying bigger cars, increased road network and numerous other factors that largely affect economic growth and the success in recent years have been neutralized. Assess the potential environmental benefits of more efficient transport is obtained should be the technical potential success in obtaining the effect of increasing efficiency and vehicle efficiency standards and ... Will consider.

The number of sections, the technical ability to increase the frequency of potential energy efficiency can be achieved there but due to economic factors and consumer characteristics, is much less than this limit. In the short term in all sectors, allowing rapid replacement technology energy savings there. What such a demand for services provided in the power sector and transportation, with success rates of current rise in energy efficiency in these sectors can be achieved will be neutralized. Achieving change in the amount of performance increase, largely to drive prices for various classes of consumers, features and other factors affecting consumer decisions, the rate of replacement of equipment and technology progress depends. Price increases to its impact on consumers of energy efficiency measures are necessary because such action by using energy efficient systems leads. Energy prices significantly (for maintaining the energy consumption in the late twentieth) should be increased. Continued economic growth, the key to maintaining fast development of technology and capital will return. Energy prices significantly (for maintaining the energy consumption in the late twentieth) should be increased. Continued economic growth, the key to maintaining fast development of technology and capital will return. Additional pollution control technologies for fixed and mobile sources of energy consumers, extensive use is to act. Development and use of this technology primarily photos and reactions of governments to restrict the pollutants are publishing. The only exception in cases of this type of technology that can improve the value of products (which otherwise apply these technologies will be lost) should help. These technologies separately, with each other and used in combination and can greatly reduce pollutants emission effect. Despite that there are things that even using the best technology available, complementary technologies alone are not held accountable, but under control with new sources of pollutants and, no doubt the use of these technologies will expand. Now, in order to control the CO<sub>2</sub> emission from fossil fuel consumption, new technologies have been considered.

#### **6. Alternative fuel:**

Among the factors involved in the historical changes of fuel, the most important factor, accessibility to economic and technological options for the use of fuel. Alternative fuel requires constant movement between the options of energy (eg fossil fuels, nuclear fuels or renewable energy), Change the current fuel to minimize the effects of seasonal or short-term (eg from gasoline to natural Gas), or use a higher quality fuel (eg, percent sulfur coal with high sulfur coal with a low percentage) is. Determine the comparative effects of various fuels on the environment, considering the full fuel cycle and its environmental impact at all stages is essential.

Terms of market penetration, increased natural gas supplies over the projected amount (more than 10%) might be able to facilitate the industrial sector, residential, commercial and power generation to replace. Substitution in the transportation sector requires major structural changes, technological development and perhaps somewhat stimulus to achieve a change. Existing gas pipelines, planning and distribution networks are capable of without spending too much time and volume of additional gas to supply. Modest increase in the use of natural gas, probably a little energy security risks is to follow.

Some of the measures so far to spread the use of natural gas have been carried out is mainly due to energy security. Governments actively considering policies and measures that are within the production and use of natural gas increased. Recently, limits access to pipelines and distribution networks, development of gas supply or transportation systems to make or store has also been considered. Before 2005, according to the alternative fuel in power generation, a significant proportion of electricity demand to nuclear power facilities that are under construction, will provide. Possible increased use of natural gas and energy production from renewable energy sources, particularly hydroelectric and biomass in some countries in the near future there. Continuing progress in technology development and cost reduction related to wind energy, photo voltaic, etc. can share the renewable energy sources increase. However, current trends indicate that increasing the share of these resources cannot require that coal growing increasingly on the use of coal to be removed will.

### **7. Clean Energy Technologies:**

This process technologies from the standpoint of those who have a combined energy efficiency and produce more pollutants without a change in the energy use, reduce. So far, the efforts taken to develop cleaner technologies on existing energy sources has helped. Fossil fuels is an example of this is due to the abundant emission of these technologies should be applied on the exercise because the cost of environmental regulations for fuels are at their maximum. Clean technologies sometimes a good feature to reduce pollution levels are complementary, despite technology, mainly for new equipment are designed. The development of clean technologies, the main purpose is to use coal. Often these technologies are not entirely commercial.

### **8. Set Field Decision:**

#### **8-1. Tool of Political Interference and the Effects of Macroeconomic:**

Political measures imposed to preserve the environment, not only a direct impact on producers, consumers and investors on the leaves, but costs and other direct economic benefits are also on. In order to preserve the environment in line with the economic and social terms are acceptable, apply the effort necessary. Despite the macroeconomic effects of such trends to the ethical environment often is not known, but to little anticipation and making such measures, would be useful.

#### **8-2. Social Analysis:**

What such a comprehensive analysis, social and economic adjustments required is a strong need for additional energy to produce better quality fuel or solid waste due to increased air pollution control technology is complementary. Because of the linkage between decision processes and balanced energy and environmental goals, Now should be to ensure environmental considerations become remain in decision-making power (in the early stages), policy decisions be taken into consideration. Some countries currently developing methodological tools in order to establish a better basis for determining a balanced and comprehensive solutions to decision makers are able to implement multi-dimensional analysis help out.

#### **8-3. Exercise Quality Control and Environmental Impact:**

Study a wide range of tools used to consider in order to unpredictable effects desirable or undesirable in policy and its implementation to determine and specify. The study areas that require new methods and is revised to specify quality requirements for exercise energy security without sacrificing environmental success is achieved. These areas include the use of fuel constraints, positioning problems, and forming air pollution rules are. Restrictions on fuel use can be for all or part of the fuel cycle to apply because of the direct and inseparable activities are energy. Types of fuel consumption, influenced by the direct effects that are most common in the production and transfer energy. Such restrictions on social and economic costs associated with the frequency that these factors often changes in energy activities, such as changes in fuel selection or related technologies or approaches to structure a longer delay. In some cases, the use of other approximation methods and environmental (environmental degradation or threats) very much remains unacceptable. In such circumstances, other criteria seem to damage the fundamental energy activities, such as out of all fuel cycle into formation. For example, decisions about new facilities applying coal-ho, especially the shift to greater use

of such fuels that, in many countries increasingly are problematic. Although the current problems in the production and use of coal has not been reflected. decision processes should to the extent they achieve results and improve the fuel usage restrictions as possible to avoid. Energy Bottlenecks positioning equipment from damage to the facilities available for the range of energy supply and energy values of various forms of exploitation, or are produced affect the choice of fuel. In some countries the problems in expanding production capacity of a energy, hydroelectric, or even coal, the balance between fossil fuels and electricity in cases where both are replaceable (such as home heating) has changed. In other countries that generate electricity entirely dependent on fossil fuels, the burning of various methods of fossil fuels, is balance. Location problems, along with the uncertain status of many industries, threatening the reliability of the system caused some countries have been. In order to solve the environmental aspects of energy locate new activities, it is necessary decision-making process be reviewed. Cumulative effect of local, locate bottlenecks and somewhat separate, comparable damage limitation National and recession are created. Tuesday the fuel cycle: nuclear fuel (due to existing concerns about safety, waste disposal and decomposition), coal (due to the pollution problems in the process or even in any of the fuel cycle, particularly If global climate change measures should be prevented) and hydroelectric (through its effects on sensitive environmental sites) do not have. Intensity of these processes are affected. In order to accelerate the positioning decisions with regard to public participation, the new approach is required. About global issues and cross-border environment, resorting to approaches such as the use of international conventions and international treaties are on the rise. Current and future efforts to improve and expand globally coordinated and aligned, as a growing challenge for governments and relevant international organizations has been made. Not only international but also national and individual pollutants should also among the acceptable environmental standards (environmental impact, cost impact, frequency and flexibility) on the one hand and energy security measures (reliability, availability, ability to adapt and diversity) on the other hand, the balance will be placed. Considering all the attention in the development and implementation process is essential. It is important to be clear in the past in the development and implementation of coordinated approaches and possible softening in the world (especially when pollutants emission reduction is considered) What has been done.

**9 . next steps:**

A - A comparative analysis of a wide range of reactions to the final consumer of energy sector (including transport and electricity) devised strategies aimed at exercising quality, safe and effective (in terms of cost).

B - according to political tool considering the application and effect capabilities and according to the evaluation of specific environmental issues and determine possible effects of such actions on the tool consumption, energy efficiency and intensity and also the costs and effects of the combination of parts energy in general.

C - according to the facilities and the effect on effective measures to encourage energy efficiency in environmental protection is achieved.

D - considering the amount of fuel availability and the effects of political tool to replace fuel

E - devised strategy to allow greater penetration of clean energy technologies in the market, many technologies that have potential but still quite have not been commercially.

F - better understand the complexities of decision-making process related to energy and environment. Particularly in relation to issues that benefit from the ability of industry related tools market.

G - Methods developed in order to provide better context for decision makers in planning the full fuel cycle, multiple pollutants and coping strategies.

H - help to effectively prioritize and design Research and development efforts to put on display and expand these efforts, the efforts to incorporate these measures in energy policy and international cooperation in order to lead to an energy system acceptable (in terms of health and money) is.

I- testing measures such as reducing CO, effects using photo voltaic and other renewable energies and nuclear fusion (before 2005) which can be important effects in the years after 2005 to put on instead

**Conclusion:**

Actions that the current situation should be taken include: better communication with consumers of energy (because informing the public requires dissemination is good) and more effort to improve its energy efficiency and conservation. Regardless of the method used to achieve goals, new measures led to a more global environmental costs will be. This undoubtedly cause major changes in the relative price of energy supply, energy use by changing fuel selection and changes in all areas of energy demand will be. Due to the potential reactions of various specific, high technical and economic potential to improve energy efficiency (especially

in electricity, transportation, and industrial use), which can often be beneficial for the environment, also be considered. And perseverance in order to maintain efforts to provide cleaner energy technologies comes to action research and energy development in national and international level 0 is critical. The research and development not only in increased efficiency and cost-effective implementation of environmental energy technologies before 2015 should be used. Technologies but to build toward sustainable use of environmental energy seems to be absolutely necessary. International cooperation in the field of energy technologies, such as technologies that are under the global energy organization, very useful.

#### REFERENCES

- Bijan, A., 1996. *Advanced Thermodynamics*, Wiley.
- EL- Sayed Y.M. and M. Tribus, 1982. "A Specific Strategy for the Improvement of process Economics", Center for Advanced Engineering Study, M.I.T., Cambridge, A, U.S.A.
- EL- Sayed Y.M. and M. Tribus, 1983. "Strategic use of thermodynamics for system improvement", in R. A. Gaggiolied., *Efficiency and Costing*, ACS Sym., Ser. No. 235.
- Frangopoulos., C.A., 1992. "Optimal Synthesis and Operation of Thermal System by the Thermoeconomic Functional Approach", *Journal of Engineering for Gas Turbine and Power*, ASME 114: 707-714.
- Kirchmayer, L.K., 1958. *Economic Operation of Power Systems*, N.Y. Jhon Wiley and Sons, Inc, pp: 8-47.
- Lozaro, M.A., 1993. "Theory Energy Cost " *Energy*, 18(3): 939-60.
- Perry's, *Chemical Engineers, Hand book*, McGraw-Hill, 1999.
- Wagner, W. and A. Kruse, "IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam " Berlin, Springer
- Wall, G., 1985. "Thermoeconomic optimisation of a Heat pump system", physical Resource theory Group, chalmers university of technology, Swedon september.
- Water Power and Dam Construction, Yearbook, 2001.
- Yoshikawa, M., N.Toshida, *et al.*, 1997. On -Lina Economic Dispatch Based on Fuel Cost Dynamics , *IEEE Transaction on Power Systems*, 12(1).