

## ASSESSMENT OF CLIMATE CHANGE WITH ENERGY EXPANSION FOR DEVELOPING COUNTRIES

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**ABSTRACT:** *The burning of fossil fuels, greenhouse gas emissions (GHG), especially CO<sub>2</sub> may cause climate change. Environmentally friendly energy progress has major consequences for developing countries as a major emitters because their population growth and fast. This article presents an overview of the developing countries in their efforts to reduce greenhouse gas emissions by energy price reform, promote energy efficiency and renewable energy. The paper focuses on the challenges facing developing countries, such as emission standards conflicting objectives realistic and motivation is hard and social consciousness. There are some options that may be, the paper concludes that reducing greenhouse gas emissions can be achieved if the policies, standards and targeted support and motivation that is practical and flexible, and the community is actively to respond environmental degradation.*

**KEYWORDS:** Energy efficiency, Climate change, Energy progress, Developing countries

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### INTRODUCTION

Energy is essential for economic development. That is to say Material comfort in the industry, however. Ways to reduce poverty in developing countries for three centuries have seen many men. The increasing dependence on fossil fuel use (Coal, oil and gas) for industrial and urban expansion. As a result, fuel combustion emissions of greenhouse gases (GHG) emissions, particularly carbon dioxide (CO<sub>2</sub>) as possible. 'Potentially contribute to climate change. The most serious consequence of the use of modern energy; at the same time the human threat of health and settlements, agricultural ecosystems and water resources as well. The most important Changes in the Earth's atmosphere began with the Industrial Revolution in the early centuries ago and were elected. Due to the increased speed domestic industry has not only responsible for their initial release of CO<sub>2</sub> during that time. But also in an increase in the level of emissions due to increased consumption, particularly fuel of fossil developing countries on the other hand, indisputable law emitter in general (see Fig. 1) given their population and population, rapid economic growth. World now is about 6 billion according to 1992 estimates by the World Bank, the world population will increase by two-thirds than double 2150. The increase is expected to occur in 2050, 95% of. Growth will occur in developing countries (World Bank 2012) population growth. Increased demand for energy and increase the average. Environmental damage, as well as a world power council predicts that the current trend of energy. Demand in developing countries will grow by 2.6%. Every year until 2020, compared with 1.4% in the world and 0.7% for the OECD (World Bank 2000: PP.20-21) If the dependence on fossil fuels for the economy. Construction remained unchanged at a very high level. CO<sub>2</sub> will be produced, particularly from developing countries (see

Figure 1).

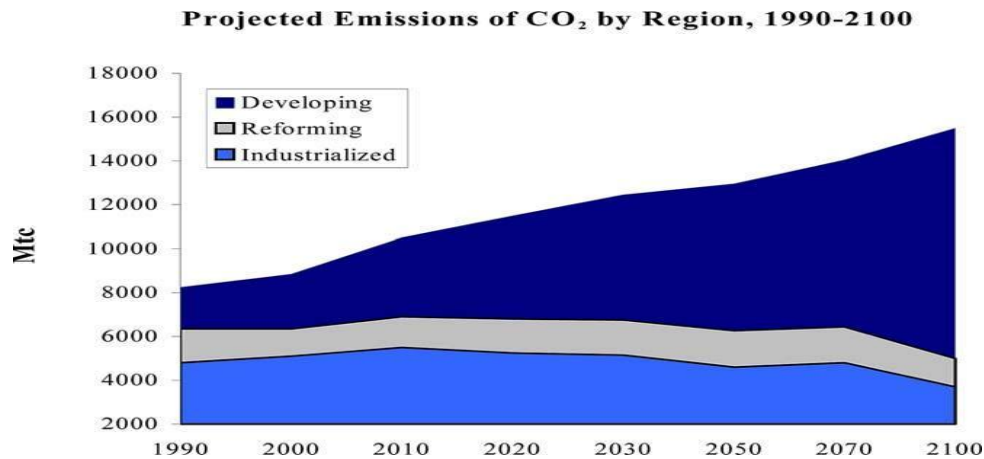


Fig. 1. Source: Johansson and McDade (2010: the World Bank).

Compared with developed countries, the situation; Population and economic growth have a significant impact for developing countries to achieve economic growth to feed a growing population without resistance. Since the destruction of the environment Economic situation is a little weak. Of the lack of effective implementation of the policies limited financial resources, good paper. Please describe the current practice in development. Countries such as the reform of the energy price promotions. The energy efficiency and renewable explore and Energy consumption in an attempt to reduce its CO<sub>2</sub> emissions. The second part focuses on the problems faced by developing countries in the process of reducing CO<sub>2</sub> emissions and. suggest some possible policy options that last part. Draw conclusions that can reduce emissions can be achieved with the support and targeted. These are realistic and emission standards and flexibility motivation and active community involvement

### **Energy pricing improvement**

#### **Eradication of downbeat subsidies**

Most energy prices are based on the principles of social and political rather than market value in developing countries (Sanderson and Islam, 2000) Pro- energy fields such as coal in China, India, Poland and Turkey have been subsidized (World Bank. 2000: p. 25), which leads to the power of folly, as well as acting as a disincentive to control greenhouse gas emissions. 1993 Bank estimates show that developing countries and transition economies to spend more than \$ 230 billion. Per year on energy subsidies More than half of the air pollution in the former Soviet Union (FSU) countries and countries in Eastern Europe as a grid, this attribute price distortions and abolish subsidies to their own will dramatically reduce the growth in energy use and can reduce global carbon emissions by 10% (World Bank, 2000: p. 41) states. Developing shows the next step 'environment more practical in the development of them. (Asia News Energy, 1999) between 1990-1991 and 1995-1996, the amount of fossil fuel subsidies in 14 developing countries that make up

25% of global carbon emissions from the industrial sector, down 45% from US \$ 60 billion - million, about \$ 33000000000 (World Bank 1997: p. 125).

In the case of China, with more than 10% of the worlds total primary energy supply, energy subsidies, on average, almost 11% of the reference price. (Asia News Energy, 1999), China has released more than 3 billion tons of CO<sub>2</sub> equivalent to 13% of global CO<sub>2</sub> emissions (ibid), beginning in 1980, China was very reform energy prices are subsidized. decreased from 37% in 1984 to 29% in 1995 and subsidized oil fell from 55% in 1990 to 2% in 1995 (Reid and Burke 1998: p 235). From 2001 to 2010. World CO<sub>2</sub> emissions totaled 338.9 million tons, China produced 54.8 million tons, accounting for 6.2% (Davies, 2000) -a decline. During characters over 6 years ago, the country ranked in the top 25 emitters CO<sub>2</sub> industries, such as India, Mexico. , South Africa, Saudi Arabia Brazil and the efforts made to reduce energy subsidies. According to World Bank estimates based on the price elasticity of demand and fuel prices, adjusted for inflation, the 26 million tons of carbon dioxide per year, the savings can be achieved by energy price reform in these countries.

### **Internalization of externalities**

Energy price reform has resulted in a greater or less than the price that reflects the cost of production. But most are still far from reflecting the social costs. Manufacturing and energy production, the benefits and costs of environmental conservations are traded in markets outside the back. The application of economic incentives, such as the cost of emissions has been shown to be an option to adjust the price in the market to reflect externalities.

For example, the introduction of oil in Mexico, along with steps will quickly reduce greenhouse gas emissions from transport China has experimented with releasing the license or permit since 1991, which determines the level of pollution, is allowed to air. Charge the cost of their disobedience to the required level. Coupled with subsidies began in 1993 to promote the latest installment of the equipment in the energy sector behavior is regulated pollutants significantly in many urban areas of China. In July 2003, more scientific mechanism for charge debit card was introduced in release, as well as inputs and pollution showed a greater effort by China to fight against emissions.

However CO<sub>2</sub> majority of economic incentives in developing countries has not led to behavior change, pollution 'as well, because they are set too high, the following countries are OECD . The cause of hunting gamekeeper continuous game (ibid, page 14), or because they are poor and selection operations this will be discussed further. The following section

### **Encourage energy efficiency with renewable energy**

#### **Encouragement of energy efficiency**

Reducing CO<sub>2</sub> emissions can be achieved by using energy more efficiently. Increasing energy prices on the market value, to reduce excessive energy use, it helps to reduce greenhouse gas emissions. High prices is to save energy, reduce emissions, lower costs for critical power transmission and distribution as well as exert a significant incentive to reduce is the fact that is

connected to the level. Because part of the theft loss, however: Thailand, 31 per cent of Bangladesh in the Philippines, Pakistan 28%, 22%, only 8% in the United States, Japan, compared with 7 percent, this loss, to the country I represent a loss.

In China, all large-scale industrial boilers, you will need to be converted to cogeneration facility. 1993 end operating results, 12% of China's electricity-installed power capacity of 14.6 GW produced by the cogeneration. (Red and gold charcoal 1998: P 235) as well as the type of energy intensity and energy, along with a standard set of management tasks include energy saving, China has managed to increase the power efficiency. Pollution prevention and closed end of a small coal mine pollution in small strong. From around the world in comparison with an amazing 25% of coal consumption reduction, alone, leading to a negative growth of CO<sub>2</sub> emissions in 1999, 101.9 million tons, and (coal news China, 1999). 44.9 million tons (Davis, 2000) Similarly, China's heavy, high operating costs, low efficiency of the power plant pollution, closing small, the amount of coal.

Mexico has developed a new boiler, refrigerator, air conditioning, mini-tower, energy efficiency standards of the electric motor. Industrial and voluntary programs to save energy and energy monitoring have been introduced. In addition, India, Brazil, start certain programs, such as smart energy efficiency.

The success of the promotion of energy efficiency depend mainly high energy efficiency, the use of low-emission technology. In this regard, developing countries in cooperation with developed countries, the benefits of the technology.

### **Encouragement of renewable energy**

In the long run, the sun, reducing wind, water, biomass, more environmentally friendly fuel compensation compared to conventional taking into account the use of renewable energy, including other forms, carbon emissions above. Many, while reducing emissions of carbon dioxide dramatically innovation (children, in 1999 to produce and continue to fulfill a significant share of renewable energy in the global energy demand, said the economies of scale in marketing. A significant comparative advantage in renewable energy sources in many developed countries. For example, approximately 6500 times the annual consumption of commercial energy solar insulation industrial north two to three times higher in those countries than in developing, greatly reduced,. Season swing, based on statistics from IEA countries to non-OECD, in 2007, renewable energy accounted for 11% of the developing countries in Asia. All of China's primary energy (TPE) from (excluding China) is that renewable energy alone accounts for approximately 20% of the TPE in terms of hydropower (Asia News Energy, 2010) is probably still great. Particularly South America, Africa, for further development in the developing countries of Asia .

Some developing countries have programs to promote the use of renewable energy Brazil, 100,000 barrels per day in place of the fuel used in transportation equipment of alcohol extracted from sugar cane 62%, there is biomass. Nepal, India, China, Philippines production of fertilizers. The promotion of private investment in the development of the power grid by using agricultural residues and waste from, and then started a small power production in 2012.

In a given marketing position to encourage the use of the advantage of not only the cost of replacing electiveness promote the use of renewable energy, such as a threat to the environment in financial incentives for fossil fuels, reducing the environmental tax I continue R & D in order. I support renewable energy.

### **Challenges and policy options**

Countries, size and population, the political system, economic structure develops, but with many different similarity. They are faced with poor economic conditions, the worst environmental degradation and climate change challenges in the suppression of this paper, the goal is realistic and limited participation, has focused on issues of public conflict.

### **Paradoxical objectives**

State policymakers development, we are fully aware of the importance of environmental protection. How-ever, more often than not, they are placed in a dilemma when left to balance between economic growth and environment. Conflicts often rise between social, environmental and economic improves. Pursuing headlong economic growth is the basis of developing countries. Top officials of the environment, and not just because the former is very important in maintaining stability, economic growth in China claimed to be more important than protecting the environment for several years there. Politics, too, contains funds environmental purification (ibid.), The goal is, in the implementation of the material, there are many conflicts developing countries. "E. Pollution principle" (PPP), has become much belabored value example, the government has explained in how to manage the company to reduce greenhouse gas emissions (SOEs).

Argentina and Brazil mining, companies that make up the oil, an essential part of the base metal and chemical sectors. India, the Enterprise is 94% of the mining Turkey, 95% of mine production of chemicals, has been exporting 70% of production and base metals companies, about 60%. Most of them are inefficient and outdated and polluting technologies and equipment, environmental regulations are bad, they are the "most persistent violators of emission standards. Therefore, not only the importance of the company, it is likely that even the participation of various interest groups both in number and strength have enough confidence that described at the expense of the government environment. Eastern Europe and Central Asia newly independent country (NIC) is the government, not only to protect their company from the market indirectly through subsidies, for, government banks and big bear, continued financing of the tax. not only paid, exclusive private, they are not only the same pressure to reduce cost competitive, if not protected from competition faced by private companies. As such, contrary to the environmental protection targets, the player acting itch. The 'gamekeeper' either makes his audits in an unsustainable way, or renders the 'poacher' waivers for pollution charges, undermining the emissions standards. After learning the rules of the game, so the release, as exemplified in the above industries, some or pay

a fine as the default case in China, it is possible to choose to pay a fine under collective bargaining. Bayan Obo pollution has an annual US \$ 11 m from the government to reduce pollution to continue to pay an annual US \$ 11 m in fines and pollution - both good and bad will happen. Therefore, at least, under lock without incurring obligations conflicting objectives and action potential efforts to achieve environmental protection "pollution", it is understood that it is possible to recognize the PPP.

Challenges for developing countries face, is to identify the balance between careful evaluation of economic development and environmental protection and exchange of benefits and costs. According to the hypothesis proposed by Simon Kuznets curve in the group known EKC economic growth, excess funds are the reduction of resource consumption, to reduce emissions. The influence of environmental damage resulting environmental damage is minimized. However, the problem is whether you can wait for the cost of developing countries are waiting since the rich countries. I develop both agents and victims of global environmental damage.

Environmental degradation is as well as the confiscation of facilities, harmful to human health, to reduce economic productivity. Agricultural production, however, to protect the environment, not only increase the productivity of the economy is an important part to improve the welfare of people today and tomorrow. Evidence shows that the environmental benefits of greater than costs in the long run. Level and the physical impacts of climate change is still uncertain, but the cost of the operation is not good, expensive than probably shot action. Well, in particular the lack of action, if any at this time, forever, can cause adverse effects on the environment. In short, developing countries, giving more importance should be attached to the level. To speed up development with consideration of environmental past, these materials in industrial processes, the pursuit of growth is not intended to be limited by the need to examine the effect of the natural environment.

Because it is different, of the energy profile, developing countries, local, energy policy of the country or region, you must be harmful to the environment. For example, energy demand large coal reserves and powerful combination is the main source of energy coal burning in Asia, which indicates that there is no change in the near future. Moreover, while Asian powers main contributors, with committing to reform and restructuring, and demonstrates the potential to improve the optimization of CO<sub>2</sub> emissions in the short term is a better option is long term. It is another option for medium and long term to promote the utilization of renewable energy resources investment to clean coal technologies. There is a deep and ongoing reform of SOEs, there is a need for energy-intensive companies in particular. They correspond to the competition, subsidies to organizations that do so much freedom to determine the compatibility of a suitable environment to have more responsibility for performance, remove the incentive. Environmentally friendly, they make the reduction of pollution and significant economic savings. There is no doubt that the reduction of pollution from energy consumption, it is possible to achieve it is not in the long-term policies that target the support and the poor.

## **IMPROBABLE STANDARDS AND INFLEXIBLE MOTIVATION**

Realistic emission standards and strong motivation is one of the obstacles to developing countries to reduce emissions. According to the OECD standards of many countries, most of are too high to be applied in developing countries. Motivated, flexible and realistic standard of "The loss of resources, corruption, facilities and destroy the credibility of environmental policy 'operator can pollute less than others due to different local conditions or because of disagreements. Relative low input compared with high pollution. If it is the same, depending on their pollutant emissions at the factors that lead to high pollution will have an advantage over someone who has a low input cause's pollution by paying a fee. Abatement costs, which can lead to increased production of factors causing high pollution. Using the experience of the West in the form of environmental pollution control strategies, need to be interpreted with caution to meet local conditions and rights. Government Katowice in Poland costs of greenhouse gas emissions at a rate twice that of the person who is appointed by the central government for the rest of Poland throughout 1980. In addition, they have somewhat improved, even for a while. Crop prices rise Industrial complaints about licensed stringent emissions and are often exempt from paying fees and fines. The city's air quality has suffered still something.

What has changed since 1990 when the emission permit to an acceptable level, in conjunction with the threat of closure and a 10-fold increase in fees and fines; Operators are now considering and really invest in a controlled environment. The city's air quality has improved significantly since then.

Polish experience may indicate that the emission standards and appropriate incentives to encourage flexibility facilitate pollution. Important point for policy makers is to set the standard for rational by nature and sources of pollution and the cost of monitoring and enforcement. "Emission standards should be defined in terms of the balance between the costs of damage caused by pollution and reduces the cost of it. For those with high input pollution emission standards can be set to start lower. Standard tightened gradually on the basis that there may be a practice that is consistent with the company 'what is really important is that the bill does not have to be complicated, as long as they encourage employers to make. Progress in innovations that reduce emissions and prevent the release of high concentrations of strong, the main consideration should ensure that the standards are clear and easy to apply.

A combination of a carbon tax with charging systems would be more flexible and effective than the latter alone in controlling emissions of fossil fuel because use is so pervasive that few people will escape the burden of controlling CO<sub>2</sub> emissions. A carbon tax is a possible way to internalize the environmental and economic externalities the resulting from the excessive use of fossil fuels. Moreover, a double dividend Might Be Achieved through the introduction of such a tax, ie, generating revenues to be used for Governments to control the pollution and decreasing of taxes Reviews such as VAT and income taxes, leading to a less distorted tax regime. However, it is

important to set the tax on an incremental basis, with an initial low tax, and incrementally increasing (ibid), to allow for adaptation of the enterprises takes place.

Whatever instruments are chosen, they must be compatible with the administrative capacities of the regulatory institutions. Standards or fines are worse than useless when they are unenforced and uncontrolled. They undermine confidence in environmental controls and induce enterprises to look for means of avoiding penalties rather than trying to reduce pollution. Experience shows that the following five Prerequisites are essential to effect the enforcement of standards and instruments.

- A local sound framework for negotiation between polluting and polluted parties;
- A clear and publicly accessible statement of the standards set and Agreements Reached;
- A means of monitoring and spot-checking pollution;
- A means of personalizing defaulters; and
- Fair and equal application of the laws and regulations to all parties.

### **Community environmental ignorance**

Ignorance of the people that have an impact on the environment presents a serious obstacle in developing countries to effectively implement environmental policies. The decision will be made in the absence of a common information environment in these countries. It also has an impact on the environment is normally open to select a range of environmental agencies and offices in charge of experts and researchers. People are more likely to be left in the dark about the severity of the adverse environment they live in, the cost to the health and quality of life and opportunities for policymakers to help. Environmental Improvement Lack of environmental awareness has resulted in indifference to environmental degradation, lack of motivation, self-control, and above all, the lack of enthusiasm to participate in monitoring the implementation of the polluting enterprises. Participation may be an effective way of implementing environmental policies (ibid, p. 89), especially for those countries chronically short of funds and trained human resources. The US has set a good example by empowering private citizens to seek injunctions and financial penalties, in some cases, the company violated the terms of their license to operate in the 1970 Clean Air Act. So enforcing environmental objectives is not the government's responsibility. Sole (ibid) have a serious impact on the economy of a litigious society, and to make it consistent with the rule of law is better than normal in most developing countries. In particular, Armenia, this has been set aside for the police actually taken from the environment. Public participation will increase enforcement officials. This is a good example of the past. Affected communities unbearable to organize themselves and show a few times to protest the government's smelter pollution. The result is a declaration of bankruptcy should be assimilated by the Court another example is the discovery.

In a survey of households in Bangladesh are the villages along the river, has proven to be surprisingly willing and able to negotiate a deal with water pollution compensation and the first step to effective treatment. Although both agents - again ill enforcement PPP, it is justified to



support the environmental problems of the community and has been actively involved in protecting the environment to a large extent, maintenance and facilities for. PPP implementations on the one hand, and encourage 'best practices in the industry pollute the other hand, with better information, including legal support agreement. Provides a cost effective way to cap the port of policies and government regulations to hold and the operator is responsible for environmental damage.

It is a major cause of environmental damage and serious obstacle to finding a solution. Therefore, it is important for policy makers to improve environmental information and educational way possible:

- The fact that created by specific environmental damage, in practice, a careful analysis of costs and benefits. Aware of the costs and impacts of the project, especially to produce citizens who are most likely to involve themselves actively in facilitating the implementation of the project and to play the role of inspector them from an environmental perspective.
- Publication and distribution of environmental regulations in a format understandable;
- To improve environmental education through the mass media and educational institutions in particular;
- Exploitation of society and an independent commission that can help in the analysis of decision-making on environmental issues that are difficult and make recommendations for the implementation of the policy. You can also check the state government and make them more responsible; And
- The strength of many people to challenge pollution, whether public or private, and to encourage public comment on the draft environmental document.

## CONCLUSIONS

The burning of fossil fuels has a bad impact on the environment and can lead to climate change. Developing countries are most at risk are likely to change because of the great reviews the economic situation of small, they are weak institutions and limited access to capital, technology and information. Have rapid economic growth and population impact on developing countries that demonstrate the need to reduce greenhouse gas emissions and mitigate the effects of climate change. Great effort has been made in the reform of pricing power, to improve energy efficiency and use of renewable resources. How-ever, efforts to control emissions are affected by the conflict, the real purpose and motivation and lack of strict environmental consciousness of society. The challenge of developing countries but it is much more extensive than previously. In particular, the current shortage of financial pressures that is important in developing countries, in the opinion of their efforts to control greenhouse gas emissions. This can be corrected through the promotion of private investment and the expansion of cooperation with international financial organizations, such as the World Bank and the IMF. But most important of all developing countries should be a

clear priority of the analysis of the costs and benefits of a balance between economic growth and environmental protection, to the target representing environmental policies, standards and incentives to participate in the symposium with enforcement mechanisms, sound and engaging public awareness about the environment.

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