

The us acid rain program environmental sciences essay

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When we look around us we see that there has been a rapid addition in the figure of industries despite the fact that there has been a lessening in the handiness of scarce resources. The Global Gross Domestic Product per capita has addition 6 times since 1900, while in the same clip period the universe & A ; acirc ; ^™s population has grown 4 times. Due to increasing planetary demand, the importance of industries in our universe has been on the rise. In order to protect theenvironmentand our universe from being over polluted it is of import that we find cost effectual ways to cut down the degree ofpollution.

The Acid Rain plan was initiated by the United States Environmental Protection Agency (EPA) in the 1990s to cut down the degree of S dioxide and N oxides, the chief causes of acerb rain. This plan focuses on emanation caps whereby each industry or company is given a certain grant or allowance for the sum of fossil fuels they can fire and if they go over this degree so a heavy mulct of \$ 2000 per ton would be imposed.

The Acid Rain Program was established based on the rules that were set by the Clean Air Act of 1990. The Clean Air Act was implemented by the Environmental Protection Agency in order to cut down the degree ofair pollution. The chief purpose of the Acid Rain plan was to cut down the degree of sulfur dioxide in the environment by 10 million dozenss and convey the degree of S dioxide down from 18. 9 million dozenss in 1980 to about 8. 95 million dozenss in 2000. This was to be done through emanation caps that focused on a lessening in the pollution caused by coal firing power workss. Companies and different industries could purchase the allowances from each other if their ingestion was higher than the allotted quota

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assigned to them. However, if that was non possible so they had to incur a heavy mulct.

Problems Associated with Acid Rain

Pollutants such as S dioxide and azotic oxides are known to be the chief ground behind the cause of acerb rain. It is imperative that in order to cut down acid rain, we decrease the figure of these pollutants. Acid rain is known to do many jobs with the acidification of lakes and rivers being the most outstanding. The lakes in the nor'-east of the United States have been greatly affected by acerb rain. The acidification of lakes leads to angle and works life being destroyed as they can non populate in acerb H₂O. As of 2001, in over 100 lakes in Minnesota all the fish have died due to sourness. Apart from fish death, it besides leads to angle non being able to reproduce. These are some of the jobs caused by acid rain which is why it is highly of import to cut down the degree of sulfur dioxide in the environment so we can forestall sourness and protect the marine life. Apart from destructing sea life, acerb rain is known to hold a negative consequence on the trees around the universe. When acid rain occurs, the acerb seeps into the trees therefore forestalling the workss from taking in C dioxide. Due to miss of C dioxide, this leads to the workss non being able to execute photosynthesis which finally leads to workss deceasing. Germany has been greatly affected where in 1983, 34 % of braid were damaged by acid rain. Acid rain besides affects us in many ways. Breathing and lung jobs that affect kids and grownups is caused by acerb rain. Due to acid rain, every twelvemonth in the US there are 550 premature deceases and 1520 exigency room visits. This shows that it is of import to cut down acid rain as it has adversely affected the

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environment and the ambiance around us. [Good background ; could spread out]

The Clean Air Act was introduced in 1963 by the United States Congress to cut down air pollution on a national degree. It was the first environmental jurisprudence that was introduced by the United States. Over the old ages at that place have been amendments and alterations made to the Clean Air Act based on the environmental jeopardies that have affected our environment such as acerb rain. A outstanding amendment was made in 1990 to take the effects of acerb rain into consideration. In the Clean Air Act of 1990, the alterations that were put into consequence were related to emanations merchandising whereby companies or workss were given inducements if they reduced pollution in this instance S dioxide, there were proviso made for ozone depletion and toxic air pollution. Apart from this, a new gasolene reformulation demand was besides set in order to command and at the same clip cut down the evaporative emanation from gasolene.

The Acid Rain plan as mentioned above was implemented in order to diminish the sum of S dioxide in the environment. In order for this to go on, the jurisprudence that was to be imposed based on the Clean Air Act of 1990 was a two stage jurisprudence. Since the aim of cut downing sulfur dioxide could non be attained in one goes, it was broken down into two stages:

Phase 1

The Acid Rain plan allocated allowances based on a annual footing and the figure of allocated units was based on a method that was used by the EPA.

The first stage of the two stage plan was from 1995 to 1999. The footing on

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which allowances or emanation caps were distributed was on the mean fuel ingestion that was used by companies from 1985 to 1987. The British thermic unit transition rate of 2.5 lbs of S dioxide per million lbs of fuel burnt was used. A major drawback of this stage was that many workss found it easy to obtain excess allowances. This could be done by through auctions where the allowances were sold to the bidder with the highest monetary value.

Many workss that were allocated allowances in Phase 1 were allocated a much higher allowance than the sum they required. The EPA did this so that all the workss could fall in the plan as they had nil to lose. Firms would experience that there is no hazard involved in fall ining the plan which is why they would choose to be a portion of it. In 1995, the initial allotment was to be 5,550,231 allowances for 445 workss. Firms were awarded excess allowances for every excess ton of S dioxide they reduced beyond the bound imposed on them. The extra allowances that were granted to houses in 1995 were 3,193,850. The stage 1 of the Acid Rain Program was to last a period of 5 old ages. Many workss and houses took advantage of the excess allowances that could be granted and due to this the entire figure of allowances in 1999 was 16,618,112 which showed that houses were willing to aline themselves with the plan. [Good]

Phase 2

Phase 2 was the 2nd portion of the Acid Rain Program that began in the twelvemonth 2000. The sum of allowance that was granted to each works was based on their mean fuel ingestion from 1985 to 1987. The transition

rate used this clip was 1. 2 lbs of S dioxide per million lbs of fuel burnt. The sum of allowance that was granted to each works was reduced but there was an overall addition in the entire cap as many more workss had entered the plan, an extra 2262 units were made portion of the plan and with the addition in the figure of units, the entire allowance besides increased to 9, 966, 531 for the twelvemonth 2000. Many units took advantage of the banked allowances that were carried frontward from Phase 1 and this entire amounted to 21, 583, 540.

Despite the entire allowances increasing due to the fact that many new units entered the plan, there was an overall lessening in the emanations granted to each unit. This figure is expected to diminish even more and the purpose of the Acid Rain Program is to cut down the entire sum of emanations to 8. 95 million dozens by 2010.

The graph above shows how emanations have been relatively higher than the allowances allocated by the twelvemonth 2000. However at the same clip, the entire allowances that were allocated to each works plus the allowance that was banked is besides greater than the emanations demoing that the sum of the entire available allowance was much higher than required.

As stage 2 continued to come on, banked allowances were finally used up and workss began to run the hazard of exceling their emanations bound. Since this carried heavy mulcts, it was imperative that companies that owned these sulfur dioxide breathing workss find a manner to cut down the S

dioxide emitted into the environment. Many different methods were presented. Some of the most noteworthy 1s are:

Technology

There were two chief engineerings available for workss to run into their emanations mark. A scrubber which is besides known as a fluke gas desulfurization system is one manner in which S dioxide could be reduced. This system is known to be really effectual as mentioned by the Environmental Investigation Agency in 1994 that the scrubber system or the flue gas desulfurization system is known to hold an efficiency rate of 85 % to 95 % . When taking a scrubber, companies have a figure of different scrubbers to take from whether it is a dry scrubber which produces a dry by merchandise or a wet scrubber which on the other manus produces a wet merchandise.

Another manner in which engineering can be used to cut down S dioxide is by either fuel shift, intermixing or co-firing. Fuel shift is comparatively simple as you merely exchange to another coal that does non breathe S dioxide, blending is when you blend two different types of coal and co-firing is merely utilizing a coal and a fuel and so these two are blended together.

It sounds easy when we say that we will merely exchange to a different coal or we will merely intermix two coals that we can happen but the existent issue and job prevarications in taking which coal, natural gas or fuel best suits your works and besides will follow with the demands set by the EPA. It is of import that when you decide to exchange to a another fuel, you use a coal that has a lower S content as non merely will it be better for the

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environment but it will besides assist you cut down the sum of S in the atmosphere therefore following the emanation cap allocated to you. When blend two types of coal it s of import that you blend high S and a low S coal. This is of import as it becomes easier for the workss to set to a smaller alteration that happens by intermixing two coals instead than fuel shift. Co-firing is besides a method that can be used but is non recommended as it is deemed really expensive.

Allowances

Allowance is a method that was really popular during the first stage. As mentioned in the statistics above, we see that the figure of allowances allocated in Phase 1 that lasted from 1995 to 1999 were much higher than expected as EPA wanted many houses to fall in this plan. The fact that many workss were over allocated allowances meant that there was no trading that took topographic point between houses selling allowances to each other as each works had adequate allowance allotted to them. These banked allowances were used in ulterior old ages by workss and at the same clip they were following with the Acid Rain plan.

Retirements

Retirement is when a works shuts down and can non be used any more. The workss that tend to utilize this method are still allocated allowances until the Acid Rain plan is integral. These allowances are non used by these workss but are sold back into the market at a monetary value whereby these workss make a net income. Ohio based Acme is an illustration of a works that has retired but is still having allowances that are sold into the market.

Previously installed Controls

Some workss already have an emanation rate that is lower than the others because of equipment or machinery they might hold installed in the yesteryear which reduces the degree of sulfur dioxide emitted into the ambiance. Installing new equipment or controls that cut down the degree of sulfur dioxide in the environment is another manner to follow with the regulations and ordinances set out in the Acid Rain plan by the EPA.

Decision

The Acid Rain plan has a few jobs since its debut but it has besides led to the lessening in S dioxide emanations in the environment. The job with Phase 1 was the complete allotment of allowances. The chief ground behind this was to promote houses to fall in the plan, which had been achieved by the beginning of Phase 2. The banked allowances that could be carried down to the following twelvemonth were an added inducement for companies. By the beginning of 2003, these banked allowances had about been exhausted and companies adapted by put ining new engineering and trading emanations.

The Acid Rain plan gave companies the pick of taking the option that is cheapest for them, whether it is emissions trading or upgrading to the right engineering. Since its origin in 1970 up to the twelvemonth 2000, this resulted in cost nest eggs of \$ 780 million when compared to a method of direct control in which the authorities would each person works precisely how much to cut down and how to make it. Additionally, sulfur dioxide emanations reduced by 4, 531, 328 dozenss.

Harmonizing to the latest information, S dioxide emanations were 8 million dozens lower in 2010 compared to the degrees they would hold been at if the plan had ne'er been implemented. In add-on \$ 122 billion have been saved in footings of lower wellness costs and decreased use of scare resources. All this shows that the U. S Acid Rain plan has been a resonant success.

As mentioned above, we see that the execution of the Acid Rain plan by the United States was an enterprise taken by the US in order to cut down the atmospheric degrees of S dioxide in the environment. This plan was a immense success as the end of cut down sulfur dioxide in the ambience was achieved. Other states should see this as an chance to follow into the footfalls of the United States. Environmental jeopardies such as acerb rain, air pollution and deforestation have been destructing our environment and it is clip that we do something about it. The Kyoto protocol by the United Nations Framework Convention on Climate Change(UNFCCC) has been really effectual in contending planetary heating and cut down the degree of nursery gases. The UNFCCC is an international environmental pact and the consequence of acid rain should be brought up at the conference that take topographic point. Acid rain is an environmental jeopardy which should be taken into consideration and be reduced otherwise it can hold inauspicious effects in the close hereafter non merely on marine life but every bit good as human life.