STUDY ON GREENHOUSE

prof.eng. LUPASCU Lorena[1]

[1]Liceul teoretic Beceni, Buzau llupascu94@yahoo.com

ABSTRACT: *In this paper we present theoretical notions concerning the greenhouse effect and solar radiation intensity analysis using weather station AWS/EV.*

KEYWORDS: *greenhouse intensity of solar radiation.*

1. Introduction

In the atmosphere there are natural concentrations of greenhouse gases such as water vapor, carbon gases, methane and nitrous oxides. Short wave length rays, visible light called the sun can cross these gases, warming the atmosphere, the oceans, the planet's surface and living organisms. Heat energy is scattered into space in the form of infrared, ie how long. The latter are absorbed in part by greenhouse gases, to reflect again the surface of the Earth. Because of this natural phenomenon called "greenhouse effect" average temperature at the Earth's surface is maintained at 15 °C. It's what we call a normal climate.

Human activity in the atmosphere is due to throw large amounts of greenhouse gases, especially carbon dioxide gas, nitrogen oxides, methane and chlorofluorocarbons (CFC). Scientific and technical revolution, increasing number of people, put before mankind technical and fundamental economic problems: increased industrial production, agricultural production, the need for intensive sources of mineral raw materials, fuels and energy. These increases must take place under maximum protection of the environment [1].

The main substances contributing to pollution atmosphere are: oxides of sulfur and nitrogen, chlorofluorocarbon-carbons, carbon dioxide and carbon monoxide, they are only part of billions of tons of pollutants that generates each year the development of industry, and terrestrial and aquatic ecosystems affects the time in which the pollutants enter in the water. Greenhouse concept was first proposed by Fourier in 1827. A simplified representation of the greenhouse effect is shown in Figure 1, and a simple explanation of it consists of the following: short-wave solar radiation can pass through the clear atmosphere almost unchanged, while the terrestrial long-wave radiation emitted by the Earth's surface is partially absorbed and re-emitted in outer space by a number of atmosphere gases in low concentrations [8]. Through this process the incident energy net land area in the lower atmosphere is supplemented thereby contributing to increasing temperature

.

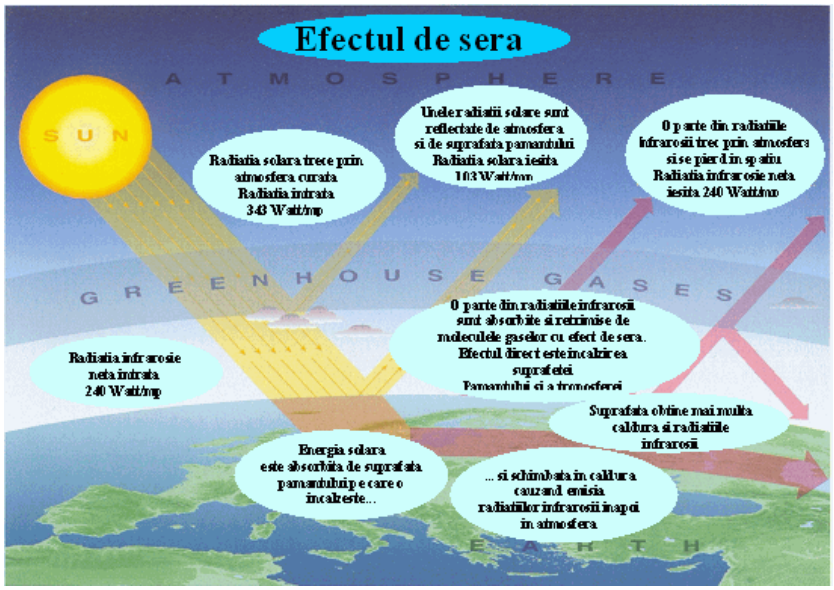

Figure 1. Formation of the greenhouse effect, [3].

Table 1 Factors responsible for the occurrence of the greenhouse effect, [4] .

Gas	Contribution	Sources
Carbon dioxide (CO_2)	50 %	Fuel combustion and wholesale destruction of forests
Chlorofluorocarbons (CFC)	20 %	Air conditioners, refrigerators, aerosols
Methane (CH_4)	16 %	Sprouting seeds, marshes, bogs
Ozone (O_3)	8 %	Air pollution
Nitrogen dioxide (N_2O)	6 %	Combustion of fuel and fertilizers

2. Materials and methods

Global solar radiation intensity G horizontally and atmospheric temperatures, was monitored weather station: AWS / EV Biotechnical Faculty of Engineering, Geco MICROS SIAP program version 2.3.2 software automatically records the following parameters: air temperature, wind direction and speed, atmospheric humidity, solar radiation, rainfall.

The weather station is wireless transmission range up to 300 m and the set of sensors integrated pillar of 1.77m and tripod for [2, 5]. Solar radiation sensor is manufactured in accordance with international specifications WMO (World Meteorological Organization).

It consists of a transducer which is heated in proportion to the incident solar radiation, absorbed by a special layer of black paint of the measuring surface of the heat. Double layer shielding of special optical glass to optimize the characteristics of the measurement under different environmental conditions.

This transducer is included in the family of smart sensors, as it is equipped with a microprocessor that performs multiple functions: checking the operation right, data preprocessing, A / D conversion to electrical signals, etc..

These features will ensure excellent accuracy and high reliability of data. The protection is made of aluminum alloy corrosion, shield UV-resistant plastic material with a low thermal capacity.

Internal circuits are protected from atmospheric discharges and polarity reversal. This is an analog sensor output signal between 0 and 2 VDC.
Privacy Framework is a aluminum alloy corrosion, UV resistant plastic with low thermal capacity. Internal circuits are protected from atmospheric changes and polarity inversion. This is an analog sensor output signal having a range from 0 V to 2V.
Measurement from 0-1300 W/m^2.
Sensitivity of 1.5 mV / W / m ^{2}
Accuracy + / - 10 W / m^2
Resolution + / - 0.5 W/m^2.
Linearity: + / - 1%
Operating Temperature -30 to 60^{0}C
Output signal: 0 V (0 W/m^2) at 2 V (1300 W/m^2)
Sensor connector 4 pin female
Mounting: with support (mast), the position is important because it must be pointed south.

3. Results and discussion

Based on recorded global radiation intensity, we calculate the direct and diffuse components of solar radiation. Based on 24 hour weather station record of 24 in 2012, we assumed diffuse radiation intensity equal to one fifth of global radiation intensity and the intensity of direct radiation is the difference between global and diffuses [6].
According to equation (1),
D - is the intensity of scattered radiation;
G - global or total radiation intensity
B - Direct radiation intensity

$$D = \frac{G}{5}, B = G - D \qquad (1)$$

We analyzed global radiation in June 2009 and June 2010, and the results are shown in Figures 2 to 7. It is noted that the values of global radiation recorded by the weather station in June 2010 are slightly higher than those recorded in June 2009..

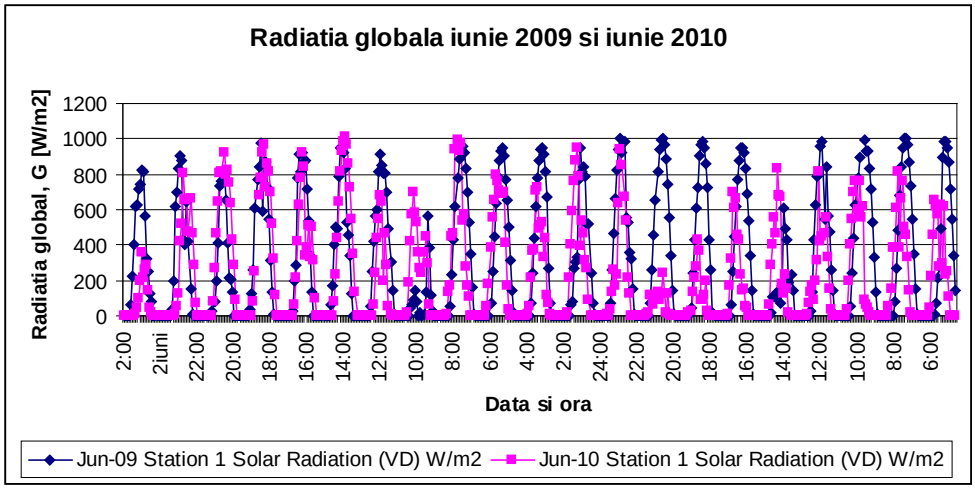

Figure 2 Global radiation in June 2009-2010

Based on global radiation recorded by station we calculated two other direct and diffuse components (Figures 5, 6, 7).

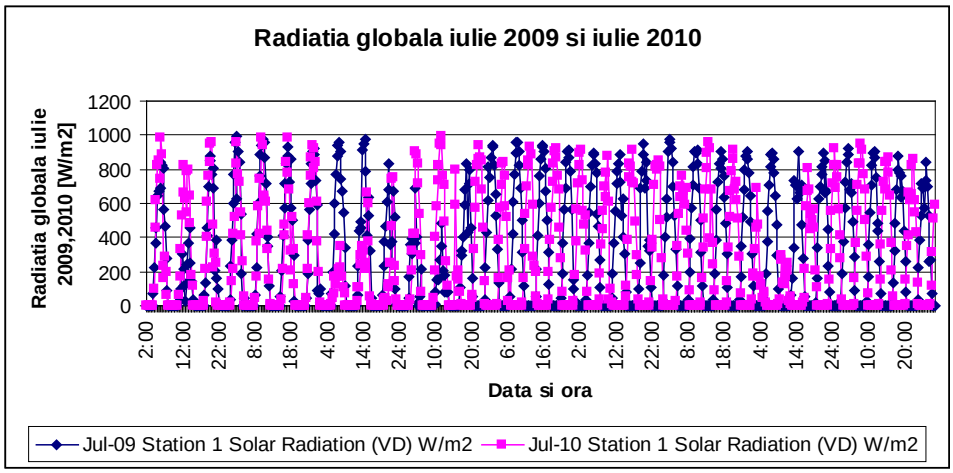

Figure 3 Global radiation July 2009 and July 2010

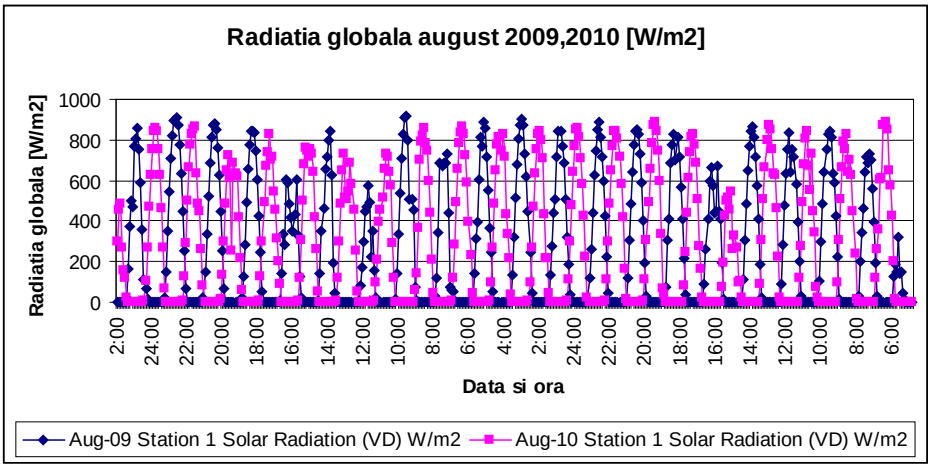

Figure 4 Gobal radiation august 2009, 2010

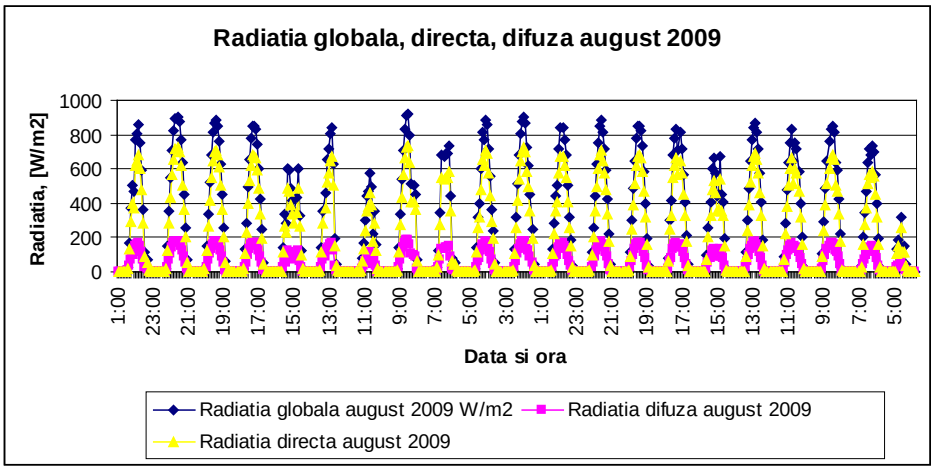

Figure 5 Global radiation, direct, diffuse August 2009

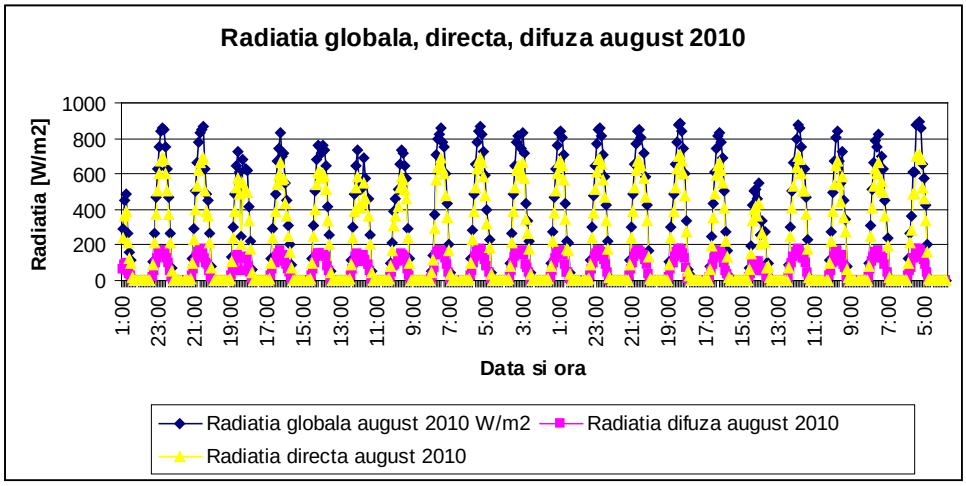

Figure 6 Global radiation, direct, diffuse August 2009

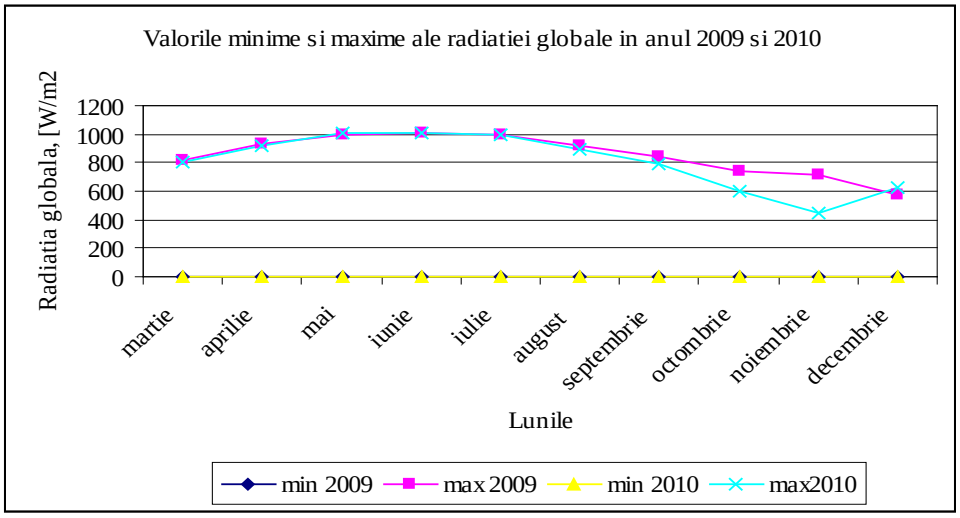

Fig. 7 Minimum and maximum values of global radiation in 2009 and 2010

Were performed and measurements of temperature and was observed that the temperatures were slightly rising atmospheric [7].

Conclusions

The greenhouse effect has produced average annual world temperature increases from 14^0C in 1880; 15^0C in 1980, forecast for 2050 is at least 170, more than 20^0 C. In Romania have been emitted to the atmosphere only in 1989, 72 million tonnes of CO_2, 41 million tons powders, 1.3 million tons of SO_2, NO_x 0.45 million tons.
Severe measures are needed in all areas (industry, transport, agriculture, appliances) backed by legislation in line with international environmental provisions to reduce emissions. Gaseous shell represented the earth's atmosphere is one of the keys to life on earth. Among the components of air, oxygen is vital plant and animal respiration, the phenomenon of

oxidation being the main source of energy for life processes. Carbon dioxide from the air occurs in chlorophyll assimilation and atmospheric nitrogen is one link in the nitrogen cycle in nature.

"Bad ozone" form in the lower layers of the atmosphere and lead to photochemical pollution type. When it exceeds certain limits, damaging life on earth.

When it exceeds certain limits, damaging life on earth. Substances that underlie the formation of tropospheric ozone are nitrogen oxides and volatile organic compounds. Tropospheric Ozone reacts with plant and animal tissues and reaches even cause greenhouse effect.

City Hall measurements performed for ozone pollution, finding concentrations exceeding the maximum permissible especially during lunch. Very tall buildings in cities and especially downtown blocks proper ventilation and air circulation.

Also, the narrow avenues which acts as real canyons, and other toxic gases accumulate for living organisms, particularly those from traffic.

The greenhouse effect is usually considered responsible for global warming and extreme weather all current. Given the amount of greenhouse gases in the atmosphere and future emission estimates were made predictions about climate change to take place. Expect an increase in soil temperature by 1-3° C at the end of the 21st century for increasing the concentration of CO_2 at 600 parts per million (increase considered significant when considering that between today and the average temperature during the last glaciation there a difference of 4-5 degrees.

He questioned whether global warming a little break and the answer was probably not. It is known that a small increase in CO_2 is beneficial to plants because they help photosynthesis. Such crops would grow and they and probably would contribute to the food supply of the world's growing population.

Would also large acreage to higher latitudes and milder temperatures in the winter season would increase the life of the plant, decreasing stress imposed ecosystems.

Regarding concerns about rising sea levels as a response to warming would lead to more evaporation and precipitation over land and that temperatures would remain below 0 ° at the poles, which would keep frozen ice caps, so eventually the ocean would decrease.

Your oldest and well known is the opposite of that, on the contrary, the ocean will increase, leading to flooding and coastal erosion, extinction of many species of fish and birds. Impact on forests, water and agriculture will be negative, soil loses moisture and increasing storm frequency. Is expected to desertification

Although the scientific community agrees that the concentration of greenhouse gases in the atmosphere has increased significantly since the Industrial Revolution (performed direct measurements of 1958 onwards and indirectly by analysis of prehistoric air trapped in glaciers) dispute over global warming cannot be easily solved in lack of meteorological data on rainfall periods. The world has become territory of beating of different camps, some frightening, others completely silent, followers of climate cooling, and others that say slow warming gives us enough time to decide what to do (30).

Solving this problem is not simple.

The greenhouse effect is necessary, it maintains Earth warm enough to be habitable. Greenhouse gases absorb and retain some of the solar heat, preventing its loss by radiation back into space and keeping warm the planet's surface.

The sun warms the earth directly to the average temperature of -18 ° C and the greenhouse gases it up to 15^oC.

Earth receives a lot of direct heat radiation from the visible and infrared spectrum, absorbing 70% of it. The rest goes back into space through reflection.
The rest of the spectrum (UV, X-ray, gamma and radio) provides less than 0.1% of the total energy received by the Earth. UV radiation reaching the ground rarely being stopped by stratospheric ozone.

REFERENCES

[1] Andreea S. – Electrosam, Efectul de sera, Anul 3, numarul 4, Ianuarie 2009
[2] Carmen - Otilia Rusănescu, Ileana Nicoleta Popescu, Marin Rusanescu, Ladislau David - Analysis of variation in relative humidity in autumn 2009, Revista International Journal of Energy and Environment, Issue 4, Volume 4, 2010, pp. 113-121, ISSN: 1109-9577
[3] Rev.Tehnica Instalaţiilor nr. 5/2003
[4][http://opengis.unibuc.ro/index.php?option=com_content&view=article&id=585:ciclul-global-al-carbonului-i-efectul-de-ser&catid=38:articole];
[5]Carte tehnica statia meteo
[6] Rusănescu Carmen Otilia, Rusănescu Marin, Stoica Dorel - ANALYSIS SOLAR RADIATION Revista Hidraulica, nr. 3 /2013, ISSN 1453-7303]
[7] Carmen Otilia RUSĂNESCU, Gigel PARASCHIV, Gheorghe VOICU, Marin RUSĂNESCU Comparative Analysis of Atmospheric Temperature Values, Relative Humidity In 2009 And 2010 In West Side Of Bucharest City, Bulletin UASVM Agriculture, 68(2)/2011, Print ISSN 1843-5246; Electronic ISSN 1843-5386, pag. 130-138]
[8].Cristian Oprea – Solar radiation, Theoretical and practical aspects Bucharest 2005