

Economy and Climate Change

The Paris Conference - December 2015

Viorel Pop
Western "Vasile Goldiș" University of Arad
leroivpop@yahoo.com

Abstract

The Paris Agreement on climate change issues was adopted at the COP.21 of December 12, 2015. Representatives from 195 countries have agreed to undertake concrete measures in order to contain the rise of global atmospheric temperatures until the end of the century, to less than 2 degrees Celsius in comparison to preindustrial era values.

As a way to boost its enactment, the agreement provides that developed countries undertake a yearly 100 billion dollars financing in Eco-friendly technologies directed to developing countries.

This paper, other than being a brief listing of Summits dealing with climate change issues also describes the evolution of the CO₂ atmosphere percentage as well as the consumption of carbon based fuels - the reason for the highly increasing raise in the concentration of the most nominated greenhouse effect gas that causes the rise of temperature on our planet.

Key words: economy, climate change, coal, oil, methane gas.

J.E.L. classification: A-20, E-21, F-64, L-61, O-13.

1. Introduction

Economic development and environment

The unhindered development recorded since the world entered the "industrial era" more than 200 years ago, started with the "unlimited" perception of our planet's dimensions, its capacity to provide "endless" nonrenewable mineral resources, unlimited well-being conditions for an ever increasing population, the capacity to endlessly absorb all pollutants generated by domestic, agricultural and stock raising activities as well as those resulting from industrial processes, of unpredictable magnitude when compared to the date humankind entered the industrial era.

The quantity of pollutants dispersed in the atmosphere, water and ground increased to an alarming manner and has gone beyond the self-clearance capacity of natural factors. We have already reached our planet's limit of bearable! Thus, it was disappointingly noticed that our planet's possibilities, thought of as never-ending, are actually limited. Our planet's billions of years' old natural balance may be seriously damaged if not irreversibly disrupted, putting life on Earth at risk. The damages inflicted on the human race by a faulty management of progress, victim of market and profit dictated interests, have begun to be noticed during the second part of the 20th century. Please follow the steps outlined below when submitting your final draft. These guidelines include complete descriptions of the fonts, spacing, and related information for producing your proceedings manuscripts.

The Paris Conference of December 2015

With the United Nations and the President of France as coordinators, the World Conference on climate change issues was held in Paris between November 30 and December 12, 2015. Its aim was to adopt an International Treaty on anti-pollution rules, measures and laws.

After intense negotiations and some compromises, the representatives of the 195 countries have

adopted the agreement that will keep under control the increase of global temperature throughout this entire century. Still, the agreement may only become effective after the 55 countries responsible for more than 55% of global emissions will have their instruments of ratification deposited.

For instance, if we refer to the Kyoto Protocol, this was adopted on December 11, 1997 but became effective 8 years later, in 2005, and the USA has not ratified it yet. (Financial Newspaper, 2015)

The main provision of the Paris Agreement is the commitment of the attending states to limit global warming to less than 2 °C until 2100 in comparison to preindustrial era values and thus avoid serious consequences of climate change.

According to the Paris Agreement each country will set forth its own aims and methods to reduce emissions and these will be presented once every 5 years and identified as Nationally Determined Contributions - NDCs. Until 2100, the population of the planet will grow from 7,4 billion to 11 billion people and fossil fuel has to be eliminated.

As a way to boost its application, the agreement provides that developed countries undertake a yearly 100 billion dollars financing in eco-friendly technologies directed to developing countries. This support will be implemented until 2020 and as of 2025 a new (increased) financial limit will be established.

Also, the UN insists it will reinforce the International Mechanism of Warsaw consisting of support in case of loss and damages (economic), mechanism that was adopted in 2013 to efficiently manage the effects of climate change among the most vulnerable states.

2. History of the “COP” summits on climate change

1987 - The Montreal Protocol

The depletion of the ozone layer as a result of intensely pollutant industrial activity has led to the enactment of the Montreal Protocol. The most developed states have established a strict schedule aimed at limiting and even eliminating the chlorofluorocarbon (CFC) compounds from industrial activities after scientists have proven these substances are responsible for the so-called “ozone hole” effect allowing the harmful ultraviolet rays of the sun to reach the surface of the Earth.

1992 - UNFCCC

At the United Nations Conference on Environmental and Development issues of 1992 in Rio de Janeiro, 154 countries have agreed to ratify a Global Treaty on climate change: UNFCCC - United Nations Framework Convention on Climate Change. Today, every country in the world has adhered to this treaty.

The main objective of UNFCCC was to set forth and enacted a series of measures aimed at preventing the interference with the Eco-system and the climate of the planet of harmful anthropogenic emissions, of greenhouse gas emissions as well as of toxic gases generated by pollutant industrial activity.

1995 - Berlin: The First “Conference of Parties” (COP-1)

The “Berlin Mandate” was adopted during this conference. The members of the UNFCCC have retained the commitments already in place as “inadequate” if the objectives to diminish global pollution were to be reached. Consequently, the decision to organize a yearly “COP Summit” was made and thus the evolution of each country from the perspective of anti-pollution measures was to be supervised and analyzed.

The “Berlin Mandate” has developed a negotiation process with the most developed nations in order to achieve from these objectives as strict as possible based on the principle that major industrial powers also have the major obligations in reducing the level of industrial pollution.

1997 - The Kyoto Protocol

As a result of the Rio Conference, the nations of the world decide in Kyoto, for the first time in the history of modern society, to lay the foundation of a global legal system to limit pollution and greenhouse effect pollution. The Kyoto Protocol has generated the taxation of pollution according to CO₂ emissions.

2002 - The Johannesburg Conference

The high level Conference in Johannesburg, South Africa, should have represented an impulse to the approach and resolution process of the issues agreed upon in Rio concerning sustainable development but this time as well expectations were higher than achievements.

2009 - COP Copenhagen

The Conference in Copenhagen, Denmark, was the first COP to which states have reached a long-term agreement on the limitation of global warming to less than 2 °C until 2100 in comparison to preindustrial era values.

Developed countries have agreed upon a financial support directed to developing countries of 100 billion dollars yearly until 2020.

2013 - COP, Warsaw

The INDC (Intended Nationally Determined Contributions) mechanism was installed on occasion of the 19th Conference of Parties (COP-19) held in the capital city of Poland. It consisted of *national voluntary platforms* by means of which each country lists the plans through which it is able contribute to the global plan of pollution and of greenhouse effect emissions reduction in order to restrain the increase of global temperature. In Warsaw, all states, including the less developed ones, have undertaken to abide by the pollution reduction process.

In Paris, on December 2015, for the first time in the history of modern society, the national policies of each country were transparently exposed to the public worldwide. This truly represented a clearer measure of nations' availability to contribute to the reduction of global pollution.

3. The "COP.21" SUMMIT: PARIS - 2015

The attendants of the 195 countries see the Paris Summit as the most important global Conference (until now) dealing with climate change.

The rise of temperature above the 2 degrees Celsius limit may lead, considering scientists' warnings, to severe climate changes: drought, floods and catastrophic storms, rise of the sea and ocean levels (with dramatic consequences for marine communities) and even the collapse of biodiversity on Earth.

According to known data the global average atmospheric temperature has increased by approximately 0,8 degrees Celsius in comparison to the year 1880. The atmosphere CO₂ concentration has gone beyond the 400 ppm in March 2015, its value being only 280 ppm at the end of the 19th century, therefore a growth of more than 40% in less than 150 years.

Obviously, throughout this entire time, mankind has known an unprecedented development in every sector and became unrecognizable. The population of the planet has increased from 1,5 billion to almost 7,5 billion people, industrial production is 43 times bigger and consumption of fossil fuel has increased 24 times. (Financial Newspaper, 2016)

The economic growth of every country is an essential challenge. Every single individual on this planet has the right to lead a decent and good life.

"Probably the most difficult task we have to solve is change the pattern of economic global growth. We have to immediately accept that wasting resources leads mankind towards catastrophe. It is a first in the history of mankind." - Christiana Figueres, UNFCCC executive secretary (United Nations Conference on Environment and Durable Development).

Summing up, the COP. 21 Paris Summit of 2015 gathers all countries of the world willing to adopt strict measures aimed at pollution restraint, measures that will first influence the mega-industry of fossil fuel (coal, oil and methane gas) and hope that will provide the development of green and renewable energies.

Position of certain states and groups of states

Developed countries intend to continue their economic expansion while developing ones naturally, want to develop their economy and hence increase their living standards.

The states that own consistent oil, coal and methane gas resources do not want to waive the business pattern that guarantees their prosperity while small and poor countries ask developed ones to take the responsibility of decent equity for everybody.

The European Union

Throughout the negotiations on climate change, the European Union undertook to reduce greenhouse effect gases by 20% until 2020 in comparison to the ones in 1990 and by 80-90% until 2050. The energy production sector, consumer of huge quantities of fossil fuel, will have to sustain the most significant efforts as they generate 80% of the greenhouse gases. (Verstraeten, 2016, p. 8)

Europe is already a traditional "climate leader" – most of the member states having introduced objectives related to renewable energies or replacement schemes for energy production employed carbon. The European Union officially declares through the voice of the main European powers in the G-7 that it is prepared for the new measures adopted in Paris and brings forward ambitious proposals to reduce pollution.

Still, given the difficulties faced by the Union, the voice of Europe does not seem to be as strong as before and some states such as Poland, the Czech Republic and Hungary have stated that these proposals are against their national interest. These and other European countries still base their economic growth on fossil resources, among them Romania. (Pop, 2016, p. 73)

Encouraging technical and technological progress

Light, heating, transport, industrial production, etc., are all based on energy. The energy sector is a strategic one given that today's society cannot exist without energy consumption.

In order to evolve towards an economy with minimum CO₂ emissions, the energy sector will need to promote, as it was called in Paris a "new technological revolution". It will mainly increase the role of electric power in reducing pollution, especially in the area of urban transport: cars, buses and trucks. (Paşa, 2016, p.15)

Consequently, we need to innovate and Europe's mission will be to reduce the discrepancies between the new Eco-friendly technologies research-development activity and their market induction.

Throughout its development process, Europe takes up increasingly much energy while, for its production, imports the major part of necessary methane gas. There are ongoing projects for the development of the green energy and the wind power sectors, mainly on the Atlantic shores of Europe as well the increase of solar energy production in the area of the North African desert and the direction of electric power towards Southern Europe. (Pop, 2015, p. 92)

But Europe is not alone in this race. United States, China, Japan and S. Korea employ massive human resources to support innovation in the energy sector, threatening Europe's leading position.

To our continent, these investments in ecological technologies, avoiding CO₂ emissions, will have a significant advantage: the decrease of fossil fuel imports, mainly oil and methane gas for which the European Union makes important financial efforts.

The role of great economical and industrial powers

To achieve the goals of the Paris Agreement, the most significant efforts need to be made by the main energy consumers, namely the most developed countries of the world. Table 1 depicts the evolution of energy consumption during the past 55 years among the first 10 industrialized countries.

Table no. 1 The most significant energy consumers - (TWh**)

	Country / year	1960	1970	1980	1990	2000	2010	2015
1.	China	14,1	16,2	17,3	27,0	39,8	95,6	121,1
2.	USA	45,3	67,5	78,1	84,5	98,8	99,8	96,9
3.	Russia	25*	29*	34*	33*	26,2	29,7	31,2
4.	India	2,3	3,4	4,1	7,9	13,3	22,7	20,1
5.	Japan	11,4	13,1	15,2	18,8	22,3	21,8	20,1
6.	Canada	8,0	9,1	9,8	11,0	13,5	13,2	13,4
7.	Germany	12,2	13,9	14,9	15,0	14,3	14,0	13,6
8.	Brasil	2,3	3,4	4,0	5,8	8,5	11,3	13,4
9.	South Korea	1,2	1,5	1,8	3,9	7,8	10,8	12,2
10	France	6,7	7,3	8,4	9,2	10,9	11,1	10,8

Source: (Monthly Energy Review & Energy Information Administration EIA, March 2016)

* URSS... until 1991 ** 1 TWh = 10⁹ KWh = 0,23 Mega-tons-petroleum

It is essential to notice the speedy growth of China during the last 30 years, whose industry dominates global economy, China itself being identified as "the world factory". A relevant example may be the steel production of China that has reached 500 million tons per year, outgrowing the cumulated production of the USA, Japan, Germany, France, Great Britain and Russia, developed countries that were among the greatest steel producers, the metal that is the foundation of industrial development.

All these countries need to be ready to adopt strict measures in order to contain pollution, measures that will have a main impact on the mega-industry of fossil fuel (coal, oil and methane gas) and will have to provide the development of green and renewable energies.

Table 2 provides the evolution and the structure of global energy production. One can notice the large share of coal in the early 20th century and the gradual replacement with petroleum, that reaches a maximum of 55% in 1980. The methane gas has a relatively constant share for the past 50 years and the nuclear energy, after a sharp rise in the '80 - '90 remained at 12-13% in the overall energy balance.

It is important to note that nowadays the world's energy consumption has increased 10 times compared to the mid-twentieth century, showing an extraordinary development of the global economy over the past 60-65 years. The biggest jump in the world's energy production and consumption was recorded in the period between 1980 and 1990.

Regarding the green energy, it grows steadily, currently representing approx. 2.5 billion tons equivalent of lignite per year, worldwide. Although it still accounts only 3% (excluding hydropower) in the total of global energy production, by the allocation of more significant financial resources in supporting the technological innovation in the green energy sector, it will have an increasing share in the next period, eliminating the carbon dioxide pollution, the main accused of the greenhouse effect, which causes the global warming.

Table no. 2 The evolution and the structure of the global energy production

Year	Coal %	Petroleum %	CH ₄ %	Nuclear energy %	Hydroenergy %	TOTAL green energy (%)	TOTAL equivalent lignite x 10 ⁹ to/year
1920	86	9	2	-	3	3	1.46
1930	75	17	5	-	3	3	1.68
1940	69	21	6	-	4	4	1.90
1950	52	32	10	-	6	6	2.52
1960	36	41	16	0.13	7	7	3.50
1970	22	52	18	1.2	6	7	6.02
1980	15	55	17	6	6	7	9.53
1990	13	52	16	11	6	8	15.07
2000	12	51	16	13	7	8	18.00
2005	12	49	17	13	7	9	20.12
2010	13	47	17	13	7	10	22.04
2015	14	46	17	12	8	11	23.67

Source: (Monthly Energy Review & Energy Information Administration EIA, March 2016)

* Green energy: rivers' energy, waves' energy, wind power, photovoltaic energy etc.

4. Substitute for conclusion

The European Union has ratified the Paris Agreement

The last stage, in whose absence the Paris Agreement on climate change could not become effective, unfolded until October 4, 2016 when the European Parliament approved its ratification in the presence of the European Commission President, Jean Claude Juncker, of the UN Secretary General, Ban Ki-moon and of the COP 21 President, Segolene Royal. This is how the political process through which the European Union has ratified this Agreement of utmost importance for future of our planet has ended.

Until October 4, 2016, over 60 countries, generating almost 52% of global emissions, have ratified the Paris Agreement. This may become effective 30 days after its ratification by at least 55 countries generating at least 55% of global emissions. Therefore, along with the acceptance and the deposit of the ratifying instruments by the European Union, the limit of 55% of global emissions was exceeded, fact that allowed the Agreement to become effective.

The Paris Agreement is the first document of its kind with universal value in the sector of climate change enforcing legal obligations for all parties involved in the achievement of the long-term global objective, namely the restraint of temperature growth to less than 2 °C in comparison to preindustrial era values, according to the capacities and the responsibilities of each state. At the same time, it requires the countries to make efforts in order to limit the growth of the average global temperature to only 1,5 °C in comparison to preindustrial era values, this being a more difficult task but with major beneficial effects.

In the negotiations on climate change, the European Union has committed to reduce emissions of greenhouse gases by 20% until 2020, compared to those of 1990 and by 80-90% until 2050. The energy production sector, the consumer of huge amounts of fossil fuels will have to make the greatest efforts in this respect, because it generates 80% of greenhouse gases. Neglecting the effects of climate change may become catastrophic to the entire planet, the vigorous promotion of green technology, of green energy.

Of course, we are all impatient to see the good effects of the ratification and the compliance of the Paris Agreement on climate change, considering both the low participation / rallying of the world states at the previous international "agreements" on environmental issues, and especially the serious, accelerated degradation of the natural environment in more and more areas on all continents of the world.

5. References

1. Paşa, F., 2016. Sustaining the Economic Growth. *The Economic Tribune*, 39 / 2016, p. 15.
2. Pop, V., 2015. The 4th Industrial Revolution. *Symposium "Science and Sustainable Development" Baia Mare – Western "Vasile Goldiș" University*, XII / 2015, p. 92
3. Pop, V., 2016. Energy – Today and Tomorrow. *University Paradigms Journal*. 3 / 2016, p. 73
4. Verstraeten, W., 2016. Pollution in motion. *National Geographic Journal*. 162 / 2016, p. 8
5. *Financial Newspaper*. 4309 / 2015, 4537 / 2016
6. *Monthly Energy Review*. March 2016 & Energy Information Administration – EIA, taken from *World Almanac*. 2016. The New York Editor