Accounting approach of the rights of greenhouse gases emissions in Romania and France

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Summary: *To underline its determination and to give an example to follow to its partners, the EU has agreed to reduce its emissions of greenhouse gases with at least 20 % by 2020, whatever the actions of other states. In this article we started from the legal context of the rights of greenhouse gases emissions. And we intend to answer questions such as: To what extent are inventoried these greenhouse gases emissions? How are registered in accounting the carbon certificates in Romania? What about France? To support the answers we used two examples of accounting entries in the two countries.*

Key words: *Accounting, emissions of greenhouse, carbon certificates.*

JEL classification: O13

1. Introduction

Political leaders have tried within the summits on sustainable development from Rio de Janeiro (1992) or Johannesburg (2002) or the conferences on climate changes in Kyoto (1997), respectively Montreal (2005) to adopt rules and a legislative framework to reduce the negative effects caused by human activity.

In the world, was invested nearly a billion dollars a day last year [Raport Climate Policy Initiative], to limit global warming and the necessary amount to implement some effective measures would be double, according to a recent study. The figures come from the latest report of Climate Policy Initiative (CPI), which shows that in 2012 were spent, to limit global warming, nearly 359 billion USD. Although it seems an enormous sum, it represents only about half of the $ 700 billion of USD per year, the amount that the World Economic Forum[1] considers necessary to successfully address climate changes.

The International Energy Agency[2] (IEA) says that, by 2020, will be necessary investments of 5 trillion USD only for renewable energy projects. The amounts invested in such projects are currently small compared with the huge funds consumed to subsidize the use of fossil fuels.

To limit global warming to 2ºC, the increase of global greenhouse gases emissions must be stopped in the next 10 to 15 years, and then they have to be reduced by 2050 to about half of the level registered in 1990. EU tries to get a new global agreement to achieve these objectives. As first step, EU[3] considers that the industrialized states should collectively reduce their emissions of greenhouse gases by 2020 by 30% below the level registered in 1990. Also, developing states, such as China and India, will have to start to limit the growth of their emissions.

[1] http://www.weforum.org/reports/global-agenda-council-climate-change-2012-2014

[2] http://www.iea.org/

[3] https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

To underline its determination and give an example to follow to his partners, EU has agreed to reduce its emissions of greenhouse gases with at least 20% by 2020, whatever the actions of other states. EU plans to achieve this reduction through actions foreseen in the new integrated policy on energy and climatic changes which will align to the existing measures. These actions are:

- saving 20% of the energy consumption compared with the predictions for 2020 by improving energy efficiency;
- the increase by 20% by 2012 of the share of renewable energy in overall energy consumption, thus tripling their current level;
- increasing ten times – to at least 10% of the proportion of biofuels in the total consumption of petrol and diesel by 2020, provided the availability on the market of the "second generation" biofuels, presenting a sustainable character and coming from non-food crops;
- the development and promotion of technologies with low level or zero emissions , including technologies of carbon capture and store – ie preventing CO2 entering the atmosphere by capturing and storing it underground, instead of already depleted gas fields or old salt mines- so as to make a major contribution to the reduction of emissions by 2020;
- better integration of EU energy markets to achieve some progress towards more competitive electricity and gas markets form EU;
- better integration of EU policy regarding energy with other policies, not just the environmental policy but also with policies such as the one on research, agricultural and trade policy;
- strengthening international cooperation: if EU manages to adopt a common approach on energy, which to speak with one voice, could thus lead the global debate;

Considering the economic, legal and social context, detailed above, in this article we intend to answer questions such as: To what extent are inventoried these greenhouse gases? How are registered in accounting the carbon certificates in Romania? What about France?

2. The rights of emission of greenhouse gases–legal context

The legal context [Barbe and ot., 2013: 332-334] given by the European Directive 2003/87/CE from 13 October 2006 established a system for exchanging carbon certificates of greenhouse gases emissions in EU starting from January 2005. These provisions have been integrated in the article L. 229-5 to L.229-4 of the French Environmental Code. The directive mentioned was amended in 2004 and 2008, and by European regulation no. 219/2009 that appreciates:

- Progressive reduction from 2013 to 2020 of the part of certificates of carbon subsidized to the enterprises aiming to reduce the greenhouse gases;
- Total suppression of compter records from 2013 of the allowances of carbon certificates to the enterprises producing energy;
- Establishment of registering from January 2013 of a system of hierarchy of non-subsidized carbon certificates, organized in an open, transparent, harmonized and non-discriminating manner.

These developments are introduced into French law by order no. 2012-827 of 28 June 2012 on the system of exchanges of charges for greenhouse gases emissions having as effect the period 2013-2020, changing the article mentioned in the code of environment starting with 1st of January 2013.

Definition and way of operation

A certificate of carbon for the emissions of greenhouse gases is a registered representative unit of the emissions that have as equivalent a ton of carbon dioxide [Our

translation]. These certificates are tangible goods exclusively material through a registration in the account of their holder in the national register. They are negotiable, transmissible through bank transfer and confer identical rights to their owners. They can be purchased, held or disposed by all physical and legal persons.

Enterprises on which this Directive applies

Industrial and commercial enterprises such as those that exploit the authorized installations to transmit gases (from energy sector, production and processing of ferrous metals, mineral industry-cement, glass, etc., manufacture of paper objects or aircraft exploitation).

The mode of operation / application

The enterprises that fall under the above conditions return to the State under constraints of penalty a number of fees equal with the total number of greenhouse gases emissions, of their installations or of the result of aviation activities according to the code of environment art. L.229-7.

3. The national inventory of emissions of greenhouse gases in Romania

The National Inventory of emissions of Greenhouse Gases (INEGES) is:

A national tool of reporting according to the laws of the United Nations Framework Convention on Climatic Changes (UNFCCC), of the Kyoto Protocol and subsequent decisions;

A tool to estimate the level of anthropic emissions of greenhouse gases resulted from sources and of the level of sequestration of carbon dioxide through reservoirs;

A tool supported by the implementation of the National System for estimating the level of emissions of greenhouse gases resulted from sources and the level of sequestration of carbon dioxide through reservoirs.

The Service for Climatic Changes from the National Agency for Environmental Protection has the obligation and responsibility of training INEGES. This is developed:

- according to the recommendations set out in the Guidelines developed by the Intergovernmental Panel for Climatic Changes (IPCC) on developing national inventories of GHGs, revised in 1996;
- the IPCC Guide of Good Practice and management of uncertainties regarding the development of national inventories of GHGs, developed in 2000;
- the IPPC Guide of Good Practice regarding the use of lands, changing the category of the use of lands and forestry (LULUCF), 2003
- using the computer application "CRF Reporter" provided by the UNFCCC Secretariat.

INEGES is transmitted to the UNFCCC Secretariat, European Comission and European Agency of Environment with annual frequency to fulfill the obligations assumed by Romania as EU Member State. The latest National Inventory of Emissions of Greenhouse Gases Romania shows the following data:

In the field of *managing the climatic changes*, Romania has ratified the Kyoto Protocol to the UNFCCC. In Table 1 it can be observed the fact that total emissions of **GHG on sectors** increased by **43,17%** in 2003-2012, and the total emissions of **GHG** (taking into account the **CO2** absorption) decreased by **44,69%,** according to the latest National Inventory of greenhouse gases emissions. The national limit for the year 2012 is 75 944 435 as number of certificates.

Table1. Evolution of GHG emissions and the evolution of CO2 emissions and new ETS ETS sectors, processing after Chisacof [2008:59-64]

			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Manufacturing and Energy	Producție de energie	GES	63,13	59,46	62,06	66,40	73,10	75,40	82,20	84,94	88,48	90,70
		CO_2 în ETS	51,88	48,40	49,93	53,31	59,66	61,23	63,23	64,29	66,38	67,78
Transport	Transport	GES	12,27	17,04	17,23	17,50	18,00	18,80	19,20	20,64	21,00	21,50
Energy for the sector commercial, residential and agriculture	Energie pentru uz în sectorul comercial, rezidențial și în agricultură	GES	11,48	12,13	12,50	12,80	13,40	14,50	15,00	15,30	15,70	16,00
		CO_2 în ETS	0,30	0,31	0,31	0,31	0,32	0,32	0,33	0,33	0,34	0,35
Industrial processes	Procese industriale	GES	17,35	18,57	20,00	21,46	22,60	25,30	26,80	28,30	28,90	29,40
		CO_2 în ETS	9,27	9,93	10,35	11,43	12,87	15,69	16,74	17,75	18,56	19,43
Agriculture	Agricultură	GES	11,95	13,93	14,11	14,53	14,80	15,10	15,50	16,10	16,40	16,60
Land use and forestry	Utilizarea terenurilor și silvicultură	GES	-34,80	-34,67	-34,80	-34,90	-35,00	-35,20	-35,30	-35,40	-35,50	-35,60
Waste	Deșeuri	GES	8,19	8,43	8,51	8,62	8,70	8,80	8,87	9,13	9,21	9,26
Other sectors	Alte sectoare	GES	24,26	25,06	25,67	26,19	27,00	29,50	30,60	31,00	31,30	31,60
Combustion processes in the industry	Procese de ardere din industrie	CO_2 în ETS	9,52	10,16	10,22	11,04	11,05	11,93	12,69	13,37	13,72	14,05
Total	Total	GES	148,63	154,62	160,08	167,50	177,60	187,40	198,17	205,41	210,99	215,06
Total sectors ETC	Total sectoare ETS	CO_2 în ETS	70,97	68,80	70,81	76,10	83,92	89,17	92,97	95,74	99,0	101,61

In Table 2 are given the values of radiative global forcing in equivalent kilos of CO2, depending on the life from the atmosphere of the particular gas, according to Rapport spécial du GIEC et du GETE, 2005. The main effluents responsible for the greenhouse phenomenon are: carbon dioxide, considered reference gas, methane (CH4), nitrous oxide (NO2), freons, aerosols and the fine particles released into the atmosphere.

Table 2

Gazul	Durata de viata în atmosfera [ani]	Potențial de încălzire		
		20 ani	100 ani	500 ani
CO_2	~ 100	1	1	1
CH_4	12	62	32	7
N_2O	114	275	296	156
CFC – 11 CCl3F	45	6 300	4 600	1 600
CFC – 12 CCl2F	100	10 200	10 600	5 200

In Table 3 are given the consumption of primary energy and the emissions of greenhouse gases in CO2 equivalent per unit of product. These values are obtained from the analysis of the lifecycle of the product [Jolliet și Cretaz, 2004:14-18].

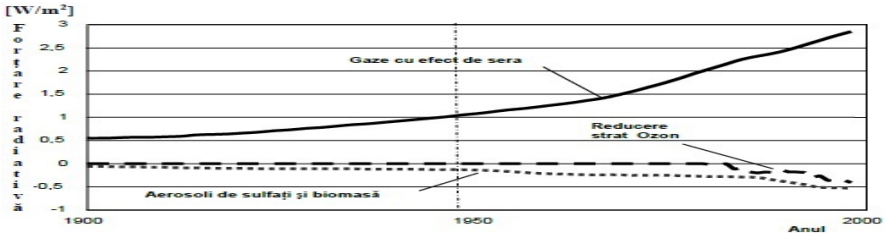
Table 3

	Energie primară [MJ/unitate produs]	CO_2 [kg/unitate produs]
Consumul energetic raportat la utilizator		
1 kWh energie electrica (UE)	13,7	0,5
1 kWh energie electrica (CH)	8,7	0,02
1 kg de păcură (42,5 MJ)	50	3,6/0,6
1 l de benzină	43	3,3/3,9/0,5
1 m^3 de apă	7 – 20	
Transport		
1000 km kg prin camion (CH)	5,1	0,3
1000 km kg cu avion	17	1
1 persoana km tren	0,5	0,03
1 persoana km automobil/avion	3,2	0,25
Materiale		
1 kg aluminiu	184	10
1 kg aluminiu reciclat	18,5	0,9
1 kg cupru	106	5,2
1 kg otel	31 — 100	1,6 — 5,3
1 kg plastice	80 — 110	2,3 — 3,5
1 kg hârtie	20	0,4
1 kg sticlă	14	1
1 kg beton	1	0,1
1 kg PC unitate centrală	210	

CH - Elveția, UE - Uniunea Europeană

The evolution of the radiative anthropic fluxes of the last century is dominated by the greenhouse gases, being partially compensated by other factors such as aerosols and

biomass (figure no. 1). From this figure is seen a reduction of radiative forcing of ozone, determined by its decrease of concentration in Antarctica (ozone hole), decrease that has as effect the increase of solar radiative flow that falls on the earth's surface.



4. Case Study– PAPIERS VOSGIENS France

Accounting operations carbon certificates offered for reducing greenhouse gases emissions - the society PAPIERS VOSGIENS [Caspar and Enselme, 2011: 157-160], Paris, manufactures various types of paper and paperboard. For its work, it complies with regulations referring greenhouse gases emissions (carbon dioxide). During N exercise, it realised the following operations on this topic: - January 2: receives 3000 carbon certificates;

- 25 March: purchases from the Powernext Carbon market 500 carbon certificates;
- 17 October: gives to the same market 600 carbon certificates;
- 31 December: the company sees that, in the case of the titles for greenhouse gases emissions corresponding to the N exercise, it has to give back 2600 carbon certificates to the State. This refund has to be made before 30 April the exercise N+1. It is used the FIFO method for these operations.

The accounting registers from France are the following:

a) Assigning carbon certificates received from the State

205 Concessions and similar rights= 489 Emission allowances allocated by the State

Calculation of taxes of emission of data by the State:

Fees provided by the state = 3000 certificates x24€ = 72 000 €

b) The purchase of carbon certificates

205 Concessions and similar rights… = 512 Bank 10 500

Calculation purchased value: Purchased carbon certificates = 500 x 21€= 10 500 €

c) The transfer of the carbon certificates

512 Bank = %		15600
	205 Concessions and similar rights ...	14400
	758 Various current management products	1200

Income from disposal= (600x 26€) – (600x24€)= 600x2€= 1200 €

d) The finding of greenhouse gases emissions at the end of the year

In this case, the company disposes of: 3000+500-600= 2900 carbon certificates

These certificates are registered in the account 205 *Concessions and similar rights* …as it follows: 2400 carbon certificates allocated, valorised at the entrance cost like this: 2400 x24€= 57 600€. And 500 carbon certificates purchased, valorised at the purchase value of: 500x21 €= 10500 €. Total value of the carbon certificates is of about 68100€.

The company has to give back 2600 carbon certificates to the State, thus: 2400 carbon certificates allocated, valorised to the entrance value like this: 2400 x24€= 57 600€. And 200 carbon certificates purchased, valorised to the purchase value of: 200x21 €= 4200 €. Total amount of the debt is 57600+4200= 61800€ .

The value of the 2600 certificates to be returned to the state is analysed as une charge of the N exercise as the restauration is consecutive to the emissions seen in this exercise. However, this exchange is totally compensated by the product corresponding to the value of 2600 carbon certificates allocated by the state at the beginning of the exercise is: 2600x24€= 62400 €.

Accounting registering:

658Miscellaneous expenses of current management	=	449 Allowances of emission to return to the states	61800
489 Allowances of emission allocated by the state	=	758 Various products of current management	62400

The income is of: 2600x24€= 62 400€

The statement balance from 31 December N exercise.

205 Concessions and similar rights ... (1)	68 100	120 – Results (2)	1800
Treasury (-10500+15600)	5 100	449 Allowances of emissions to return to the state	61800
		489 Allowances of emissions allocated by the state (3)	9600

(1) 2400x24€+500x21€

(2) Results of the operations on allowances:

- results of sales..... +1200
- net income from the emissions from the exercise (62 400 - 61 800) ..... +600

1800

(3) This product is for 400 certificates 24€= 9600€

Possible finding of an impairment

From the 2900 carbon certificates owned by the society at 31 December N exercise, 2600 have to be returned by 30 April exercise N+1. For the last ones there is no problem of impairment. For the remaining 300 certificates companies are available for later use. They represent actives on which the enterprise has to make an impairment test. In case their closing rate would be set at 22 € while the accounting value is of 21€, then no impairment should be found.

Refund of carbon certificates to the State:

449 Allowances of emissions to be surrendered to the state	=	205 Concessions and similar rights ...	61800

Value of concessions = 2400x24€ + 200x21€= 61800€

At this date the account *205 Concessions and similar rights ...* is debtor with a value of € 6,300 (ie 300 x 21€), available for later use.

5. Case Study - Romania

SC INVESTMENT TRUST SA, located in Romania sells certificates of greenhouse gases emissions to a society from EU (France) and to a society from outside EU (Switzerland).

Accounting records as sales operation

According to the art 3 let. b) from GD 780/2006[4] establishing the trading scheme of certificates of greenhouse gases emissions, these certificates represent the right to emit a ton of carbon dioxide. Thus, our entire analysis is based on the fact that a provision of

[4]http://lege5.ro/en/Gratuit/ha3dqnzq/hotararea-nr-780-2006-privind-stabilirea-schemei-de-comercializare-a-certificatelor-de-emisii-de-gaze-cu-efect-de-sera

services is sold, the sale of these rights being considered provision of services from the point of view of VAT according to art. 129 from Tax Code[5].

The sale is made to a taxable person within the meaning defined in art.127 para (1) from the Tax Code, in essence an economic entity that performs an activity of independent manner regardless the place of work. We start from the principle that the physical person and the non-taxable person cannot use these certificates.

Declarative obligation in terms of VAT

In terms of VAT are applicable the provisions of art. 133, para (2) of the Tax Code which establishes:

The place of supplying services to a taxable person acting as such is the place where that person receiving the services has his business established. If services are provided to a fixed establishment of the taxable person, located in another place that the one where the person has the establishment of his business, the place to provide services is the location of the fixed establishment of the person that receiving the services. In the absence of such a place or fixed location, the place of providing services is the place where the taxable person who receives these services has his permanent address or usual residence.[6]

In other words, the place of providing services for the deliveries to the beneficiary in France is at the establishment of the beneficiary in the Community, fact for which no VAT invoice will be issued. Both companies have to submit the VIES declaration, known to us as the Declaration 390 with deadline submission until the 15 of the following month, according to art. 156 para (4) from the Tax Code. In the declaration 300[7] is taken from row 3 and 3.1, the beneficiary having the obligation to solve the reverse charge measure.

We want to develop the analysis of the taxable person established outside the Community, as specified in section 13 para (8) from the Implementing Rules of application of art 133, para (2) from Tax Code, given below: (8) Services provided by art. 133 para. (2) of the Tax Code, provided by service providers established in Romania to beneficiaries taxable persons who are established outside the Community, or, where applicable, are supplied by service providers established outside the Community to beneficiaries taxable persons who are established in Romania, following the same rules as the intra community services in terms of determining the place of supply and other obligations imposed by this title, but does not impose obligations on the summary declaration under Art. 156 para. (4) of the Tax Code , whether taxable or exempt from tax and no obligations relating to the registration in VAT purposes specific to intra-community services referred to in art. 153 and 153.1 of the Tax Code.

Therefore, the place of supply of services is also at the beneficiary establishment from outside the Community, there is no record of art. 126 of the Tax Code that is executing the service on Romanian territory, thus the invoice is issued without VAT. It is recorded in Expense account 300 only in row 3.

It requires from the company the possibility of documentation demonstration of the fact that it is a taxable person, such as any financial statements or documents showing that in

[5] http://static.anaf.ro/static/10/Anaf/Legislatie_R/Cod_fiscal_norme_2014.htm

[6] http://static.anaf.ro/static/10/Anaf/formulare/dec_390_2011.pdf

[7] http://static.anaf.ro/static/10/Anaf/Declaratii_R/300.html

the third state a VAT system is applied or other documents proving the economic character of the activity carried out by the beneficiary.

In terms of accounting monograph, in both situations is made accounting entry:

4111 ”Clients” = 704 “ Incomes from providing services.

Conclusion

Total emissions of **GHGs on sectors** have increased with **43,17%** in 2003-2012, and the total emissions of **GHGs** have decreased with **44,69%,** according to the latest National Inventory of the greenhouse gases emissions. The national level for 2012 is 75 944 435 as number of certificates.

In 2011, these grants were of about 523 billion USD estimates IEA, while the grants for energy from renewable sources, at global level, were of only 88 billion, including 20-22 billon for biofuels. The question raises why this happens, why are not used more many for energy from renewable sources?

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