

## THE DEVELOPMENT OF THE EMISSIONS TRADING SCHEME AND OF ITS REGULATION

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**ABSTRACT:** *Nowadays the role of the environmental protection is increasingly becoming one of the main topics in the politics and the economic instruments, in particular the emission trading systems have key role in the regulation. The aim of the study is to point out the importance of the economic instruments in the system. The study analyses the historical background and the various methods of the field of the market of the pollution rights. The emission trading system of the European Union has a particular importance, it became a reference model to the other countries all around the world. The study presents the system of the EU as well the the countries adopted the EU's system. The functioning of the emission trading systems are not without problems, the aim of the authors is to highlight these relating problems too. These problems are for example the participation, the distribution of the pollution rights and the use of incomes. It is clear that the emission trading systems have to face with several difficulties, but this system can be a solution for the environmental problems.*

**KEYWORDS:** *environmental protection, emission trading system, cap and trade system, greenhouse gases*

**JEL Code:** K32

### 1. INTRODUCTION

The COP 21, also known as the 2015 Paris Climate Conference took place between the 30 November and 11 December 2015 in Paris. The aim of the UN's negotiations was to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C and to discuss economical, financial and environmental protection aspects. The 195 countries adopted the first-ever universal, legally binding global climate deal and accepted full responsibility to limit global warming to well below 2°C and to limit the increase to 1.5°C because this would significantly reduce risks and

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the impacts of climate change. The agreement will enter into force in 2020.<sup>1</sup> In order to achieve this aim from 2023 the countries come together every 5 years to review the set goals. The Paris Climate Deal contains a long term goal, namely from 2050 the CO<sub>2</sub> emissions need to get to zero, with other words the long term goal of the deal is to achieve carbon neutrality.<sup>2</sup> Towards to achieve these set goals it is obvious that there is need for a huge amount of money. The developed countries will continue to support the developing countries to reduce their emissions and to this the developed countries intend to mobilise USD 100 billion per year until 2025. The Paris Climate Deal opens a new chapter in the use of renewable energy. According to the concept from 2050 the renewable energy sources will cover the energy demand of the humanity.<sup>3</sup>

It is clear, that the Climate deal will influence the emissions trading scheme too, but there are no informations according to that connection yet.

The aim of the regulation of the emissions trading scheme is to create artificial market for the countries, where they can buy rights for actual or potential contamination and sell their pollution rights. The essence of the system is that norms specify the permissible levels of contamination for the polluters. But if the contamination is lower than the prescribed measure, than the polluter can sell its right to an other polluter and so this person can reach excess emissions.<sup>4</sup> The trading of pollution rights emerged from the United States of America. There models served as examples for developing the system: the Los Angeles's program from 1993 and the Clean Air Act.

According to the Los Angeles's program the ozone concentrations of the Los Angeles's basin was reduced through the limitation of the nitrogen oxides' emission. The program from 1993 covered the greatest nitrogen oxid emissioners. They received emission rights from the authority. The emissions rights could be sold and bought between the emissioners.

The Clean Air Act was another example for the trading of pollution rights. The aim of that act was to reduce the emission of sulphur dioxide. In the first phase the system contained the largest polluters and from 2000 during the second phase all kind of power plants had to meet the rules of the act. The main point of the system is the same, the steam power stations can sell and buy emission quotas, but they can not exceed it.

In the system of the USA the pollution rights are delageted to Member States by the Environmental Protection Agency (EPA), and the Membes States delegates the rights to the emissioners. According to the standard practice the pollution rights are sold and bought by both Membes States and emissioners. The firs auction of sulphur dioxide was held by the EPA in 1993 through the stock exchange of Chicago (Kiss, 2005).

## **2. METHODS OF REGULATION ON THE MARKET OF POLLUTION RIGHTS**

On the basis of the American model several methods developed on the pollution rights' market (Kerekes, 2007) (Szlávik, 2005).

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<sup>1</sup>[http://ec.europa.eu/clima/policies/international/negotiations/paris/index\\_en.htm](http://ec.europa.eu/clima/policies/international/negotiations/paris/index_en.htm) (20. 1.2016)

<sup>2</sup><http://www.carbonbrief.org/explainer-the-long-term-goal-of-the-paris-climate-deal> (5. 1.2016.)

<sup>3</sup>[http://europapont.blog.hu/2015/12/16/parizsi\\_klimacsucs](http://europapont.blog.hu/2015/12/16/parizsi_klimacsucs) (5. 1.2016.)

<sup>4</sup> Kerekes Sándor: A környezetgazdaságtan alapjai, Budapest, 1998. [www.mek.niif.hu](http://www.mek.niif.hu) (7. 11. 2015.) p. 102.(Szlávik, 2005).

- Emission Reduction Credits
- Bubbles Policy
- Emission Offset Mechanism
- Netting Out

The system of the Emission Reduction Credits means that the companies' (which pollute under the norm) overperformance is recognised as credit, and doing so will make the polluters interested in the reduction of their emission. The credits function as money, because they can be sold in the same region or can be reserved on bank accounts. This is the reason why the name of this system is emission banking transactions. For this system several environmental banks were established in the USA. The main element of the emission' sale and purchase is the Emission Reduction Credits.

The Bubbles Policy is a combination of the emission and imission regulation. There is ecological quota for certain regions, and this could not be overstepped by the polluters. It can be said that a bubble is created over the regions, in which the level of pollution is defined. The pollution's rights are distributed under the bubble, and the companies can not overtake this level. It is important, that the emissions can be transfered between the polluters. But there are several problems with the effectiveness of this method. If the companies are able to reduce the emission could this mean that the norms are too weak and the companies can slow down the environmental innovations because they are affraid of strickter future rules.

The Emission Offset Mechanism can be managed inside of a company or between companies. The system enables the establishment of new companies if the existing companies reduce their emissions so that the common emission level of the existing and new companies will not exceed the allowed level.

The Netting Out System promotes the innovation with consolidated norms. The main point of the system is that a company's new investment or the modification of its technology will not raise the pollution level and so the environmental authorisation will be largely simplified.

A proposal was made for the trading scheme of the pollution rights. It contained such a trading system, which would cover the whole world market and would based on the American system. The UNCTAD proposal based on the world market and on commodity exchange and according to this proposal these two would be responsible for the carbon trading (Kiss, 2005). The market of pollution rights is based on two principles: on the external offset and on the clearing house. These principles means that the level of pollution should be observed by all members of the system. The principle of external offset can be interpreted between nations, because the developing countries could be able to fullfill the terms cheaper and easier if the developed countries apply the instruments, which can reduce emission.<sup>5</sup>

In 1992 a proposal was presented aiming to establish the market of pollution rights in the European Union.<sup>6</sup> The conception based on a coupon system. The coupon was valid for one occasion and when the carbon dioxid emission occured, the coupon will lapse. The coupon would like handle as a security. The main point of the proposal is that the coupons will be hand out between the hydrocarbon producers and exporters and the coupon will be

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<sup>5</sup> Kiss (2005.) p. 183.

<sup>6</sup> Kiss (2005.) p.286. The title of the study was the economics of limiting CO<sub>2</sub>

treated as money. The proposal did not have any specific response and was a more disadvantaged construction than the American one, because in the USA the polluters got their pollution rights for free and in the EU's system the polluters had to pay for it.

A flexible compensatory system was introduced in Germany and this system is similar to the USA's system. The companies has to stick to the norms, provided by the authorities, but if the company reduces its emission, the surplus can be sold to other regional companies. But there is one condition of this sale. The authority will give its permission if the emission will be reduced by the sale in the region. This method contributes the gradual reduction of emission.

The Kyoto Protocol defines several flexible mechanism in order to reduce the costs (Csák, 2008) (Hey, 2007):

- Joint Implementation
- Clean Development Mechanism
- International Emission Trading

According to the Joint Implementation the transaction will be come into being between the obligated countries. The emission reduction, emerged from emission reducing aiming investment, will be shared between the investor and beneficiary countries and so the beneficiary countries have to right to sell the emission reduction.

The Clean Development Mechanism refers to the transactions between the developing and developed countries. When an investment is realized by a developed industrial country in the territory of a developing country, the achieved emission reduction will belong to the investor country.

The International Emission Trading takes place in cases when a country overfullfills its emission reduction obligation. Its unused pollution rights can be sold to an other country. So the pollution rights can be sold to any country.

In chronological order the next step in the development of the trading system is 2009,Copenhagen, but new agreement was not accepted here. The amendment of the Kyoto Convention was approved in 2012 and according to this the second phase has begun. This takes place from 2013 to 2020 and the aim is to reduce the emission (Anikó, főrő an). The European Union and Australia has been fighting for strickter regulations. Canada highlighted the fact, that the extension of the Convention has no point, because the two major emisioners of the world do not take part of it (Csák, 2008).<sup>7</sup> The Paris Climate Conference, as introduced in the introduction, opened a new chapter in the climate protection.

### 3. THE EU EMISSIONS TRADING SYSTEM

The EU has established its own emission trading system.<sup>8</sup> In the framework of the European Climate Change Program the Commission has developed its own regulation for the EU's own trading system. The legal basis of the system is the Directive 2003/87/EC, which came into force on 1 January 2005. This system is the world's biggest cap and trade system,it covers 12.000 businesses and consists of the following elements: authorisation

<sup>7</sup> [http://index.hu/tudomany/2012/12/08/meghosszabbítottak\\_a\\_kiotoi\\_jegyzokonyv\\_ervenyesseget/](http://index.hu/tudomany/2012/12/08/meghosszabbítottak_a_kiotoi_jegyzokonyv_ervenyesseget/) (10.11.2015.)

<sup>8</sup> (Csák, 2008)Csák (2008.) p. 127-132. Szilágyi János Ede: Környezetvédelem az európai uniós jogban, in: (Szlávik, 2005).

of emission, follow up for emission, monitoring, national allocation, report about emission, calibration, national registry and the supervision of the system.

The businesses belonging to the system are allowed to do their activity in case if they have greenhouse gas permit. According to the abovementioned Directive the Member States have the right to lay down the merits of the allowance units. The national units were allocated between sectors.

The operators shall have an account at the national registry and this registry contains the registration of the obtaining, transfer and cancellation of the emission units. The operators are entitled to sell their units freely (Fodor, 2007).

Before the adopting of the Directive there were several professional debate about the greenhouse gas emission allowance trading scheme of the Community. The consultation has started on the grounds of the Green Paper, which contains the main elements of the system. The European Climate Change Plan also deals with this problem. The Council recognised the importance of the trading and the fact, that a trading system should be introduced in the Community, but the Sixth Community Environment Action Programme ordered to set up the emission trading scheme till 2005.<sup>9</sup>

According to the Directive the Member States have to define the annual top emission of the industries, which are subjects of the Directive. The emission allocation is divided between the polluters. The national allocation plan should contain the maximum amount of the overall emissions and the distribution of the emission units. The polluters have to transmit emission units to the state and they are entitled to sell the remaining units freely. In case if they did not use their whole units, they can sell it in the EU or they can reserve it.

The basis of the system is the emission unit, which is a marketable financial assets and it enables to emit one tonne of carbon dioxide within a specified time limit<sup>10</sup>.

The Directive includes the following requirements:

- the emission unit entitles the polluter to emit one tonne of carbon dioxide
- it is valid for a specified period of time
- it can be used only as a compensation after the emission
- it can be sold to everybody
- it is a financial asset
- the mutual recognition of the emission unit between the Member States

According to the Directive the Member States have to establish the registry system, which is public and it registers the sales of the units and the owners.

The system includes sanction for the breach of the rules. If an operator does not fulfill its obligations, than it has to pay a fine and in case of a repeated breach the Environmental Protection Agency has the right to limit, suspend or withdrawn the permission. Furthermore if the polluter does not fulfill its obligation to notify or register, the polluter can sell its emission units till it will fulfill its obligation.

Three phases can be distinguish since the operation of the cap-and trade system:<sup>11</sup>

*Phase 1: 2005-2007:*

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<sup>9</sup> The Sixth Community Environment Action Programme confirmed a 8 % cut during the period of 2008 and 2020.

<sup>10</sup> Ludwig Krämer: Az Európai Unió környezetjoga, Dialóg-Campus Kiadó, Budapest- Pécs, 2012. p. 5-65.

<sup>11</sup> EU ETS 2005-2012 [http://ec.europa.eu/clima/policies/ets/pre2013/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/pre2013/index_en.htm) (5.1.2016.)

The phase one was a three years long pilot period aiming to prepare for phase two, when the EU ETS would need to function effectively to help ensure the EU and Member States met their Kyoto Protocol emission targets. During these years the infrastructure of the trading system was established. It is important to emphasize that during the phase one the system was based on conceptions, because of the lack of factual informations.

*Phase 2: 2008-2012:*

In 2008 the EFTA States joined the EU's system and the scope of the system was widened through the inclusion of nitrous oxide emissions from the production of nitric acid. The penalty for the exceedings was increased to 100€ per tonne. During this phase several auctions were held by the Member States. The phase two coincided with the first commitment period of the Kyoto Protocol. The global financial crisis had impact on the emission trading too, because it led to larger and growing surplus and affected the price of the carbon heavily.

*Phase 3: 2013-2020<sup>12</sup>*

Because of the financial crisis short- and long-term measures were introduced by the European Commission. The reason of these measures was that the financial crisis affected the emission trading scheme worst than expected. The surplus build-up slowed down from 2014 and the long term aim of the phase three is to achieve that the number of the emission units should not decline significantly. The short term aim is to stabilize the operation of the carbon market. As a short-term measure the Commission *postponed the auctioning* of 900 million allowances until 2019-2020.

The auction volume is reduced by

- 400 million allowances in 2014
- 300 million in 2015
- 200 million in 2016.

As a long term solution a market stability reserve will be introduced and its aim to address the market imbalance. The system will be operated from 1. January 2019. The postponed 900 million allowances will be disposed in the Market stability reserve and if the surplus will reach a certain threshold, than these surplus will be transferred automatically to this system. An other aim of the reserve is to achieve a faster reduction of the annual emissions cap.

*Phase 4: 2021-2030<sup>13</sup>*

The European Commission presented in July 2015 a legislative proposal to revise the EU emissions trading system for the period after 2020. To be able to achieve the EU's target: the 40 % cut in the emission, from 2020 the EU has to reduce its emission annually by 2.2 % (currently this rate is 1.74 %). The proposal contains a more predictable, robust and fair rules to address the risk of carbon leakage.<sup>14</sup> According to the expectations 6.3 billion allowances will be allocated for free to companies over the period 2021-2030. The proposal contains several support mechanisms, targeting to help the industry and the

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<sup>12</sup> [http://ec.europa.eu/clima/policies/ets/reform/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/reform/index_en.htm) (5.1.2016.)

<sup>13</sup> [http://ec.europa.eu/clima/policies/ets/revision/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/revision/index_en.htm) (7.1.2016.)

<sup>14</sup> Carbon leakage is the term often used to describe the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries which have laxer constraints on greenhouse gas emissions.

power sectors meet the innovation and investment challenges of the transition to a low-carbon economy. Two new funds will be established:

- Innovation Fund – extending existing support for the demonstration of innovative technologies to breakthrough innovation in industry
- Modernisation Fund – facilitating investments in modernising the power sector and wider energy systems and boosting energy efficiency in 10 lower-income Member States

#### 4. THE IMPACT OF THE EU'S REGULATION

It has been a decade since the European Union started its own emission trading scheme. The EU's system provided an example for the world and several other countries developed its own trading system on the basis of the EU's system. At present there are several cap-and trade systems and the level of the CO<sub>2</sub> emission is increasingly reduced. The following examples will show what kind of effect played the EU's cap-and trade system around the world.

Switzerland introduced its cap-and trade system in 2008, in the first 5 years the accession to the system was voluntary and the accession was an alternative option instead of paying taxes for carbon dioxide. But from 1 January 2013 the accession to the system is compulsory for the energy-intensive industries and the medium size companies have the opportunity to join the system. For the period between 2013-2020 the participants are released from the obligation to pay taxes relating to the emission. Currently Switzerland conducts negotiations with the EU about the possible connection between the two systems.<sup>15</sup>

The first emission trading scheme in China was established in 2013 in Shenzhen city. This city is the first special economic zone in China. Between 2013-2015 this emission trading system had 635 participants. In 2012 (before the system was established) the first law was adopted relating to the emission trading. After this several emission trading systems were established in different cities for example in 2013 in Beijing and in Shanghai.

In North-America the first regional initiative for limiting greenhouse gas emissions began in 2007 and as a result of this the first emission trading scheme<sup>16</sup> was established. From 2015 the aim of the system is to reduce the emission with annually 2,5 %, and from 2018 with 10%.

In California the emission trading system came into effect in 2013 and currently the second trading period takes place (2015-2017). The system contributes that the state could achieve 80% emission cut between 1990-2050.

It is clear from the aforementioned examples and dates that the EU and its 28 Member States and the 3 EFTA States are at the forefront in this field and they have a decade of benefits in this field compared to other countries around the world.

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<sup>15</sup> The basis of the negotiations is that the Swiss system is based on the EU's cap-and trade system and a substantial part of the Swiss system was established so that it can fit to the EU's system.

<sup>16</sup> The system operates in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and in Vermont.

## 5. PROBLEMS RELATING TO THE EMISSION TRADING SCHEMES

The developed emission trading systems raise several regulatory problems. The formation of the system got several critics worldwide and the literature discovered other problems too. One of these problems is the allocation of the rights. From the point of view of the operating of the system it makes no difference how the rights will be allocated but the allocation is a very important thing for the participants. Each participant is interested in getting as many rights as they can get. Hereby they can reduce their costs and get more incomes from the selling of the rights. The developing countries can get resources and these plus incomes can be spent to develop the country.

The theory distinguished ten allocation principles<sup>17</sup>:

- The horizontal allocation allocates the pollution rights in order to achieve that the net costs of the pollution reduction should be equal to GDP ratio between the countries.
- The vertical allocation allocates the pollution right in a progressive way, namely the net pollution costs should be directly proportional to the GDP per capita indicators.
- The principle of the ability to pay allocates the gross costs on the ground of GDP indicators.
- According to the principle of sovereignty the rights should be allocated on the ground of the amount of emission.
- The egalitarian principle allocates the pollution rights between the countries on the ground of the ratio of population.
- According to the market principle the pollution rights should be auctioned and those will receive the rights, who pays the most for them.
- The allocation of the pollution rights should depend on political agreements according to the consensual principle.
- According to the compensation principle the countries, which suffered economical losses after the allocation should get compensation.
- The Rawls's principle means the maximization of the net advantages of the poorest countries.
- An environmental protectional aspect emphasizes the protection of the environment and according to this it limits the allocation of the pollution rights.

An other problem is the question of the complementarity and the compulsory membership. The system does not cover the low-value and diffuse polluters (transportation, households, services). If the system applies wide-ranging exemptions and reductions in that case the system won't be effective. It is important to apply the system in wider-range. It is clear, that the emission trading system is a supplement to the system of energy taxation.

The influence of the climate change can be effective if the greenhouse gas emission reduces continually. To achieve this annually fewer and fewer rights will be allocated and this effects the market of pollution rights significantly.<sup>18</sup>

A lot of criticism was voiced concerning the income from the sale of the pollution rights. Besides of the free allocation of rights the rest will be sold on auctions and this will

<sup>17</sup> Adam Rose: Equiti considerations of tradeable carbon emission entitlements, UNCTAD 1992. In.: Kiss (2005.): p.188.

<sup>18</sup> Kiss (2005.) p.195-196.

result income. But the decreasing tax revenues could reduce the money for environmental protection programs.

An other question is the use of proceeds. The total proceeds of the sale of the pollution rights won't be used for environmental purposes. According the system a theoretical question arised, namely the Ambient Permit System (APS) or the Emission Permit System (EPS) should be established. The APS allocates the rights according to the receiving compartment, and the system is based on complex norms and geographical conditions. The EPS operates easier and it allocates the rights on the basis of emission sources. But this system could cause that on a smaller territory a more serious pollution can come into being while the average contamination will not change.<sup>19</sup>

## 6. CONCLUSION

Despite of the problems the literature set up the criterias for the optimal functioning of the emission trading systems. According to this the market needs for the optimal functioning a sufficient number of sellers and buyers and adequate regulations. The significant difference between cost benchmarks of reduction of pollution means problems in connection with the emission trading systems but hopefully the aforementioned Paris Climate Deal will contribute in order to solve this problem (Zoltán, 2013). In any event the Climate Conference pointed out that it is very important to find solutions in order to reduce the emissions and to develop technology. The indirect economic instruments and solution became more and more important next to the direct environmental protection instruments. The economic instruments provides sometimes better solutions than the administrative tools. It can not be said that the emission trading system is perfect, but the experience has shown that the market accepted the system and it can be an effective tool in order to reduce emissions.

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<sup>19</sup> Kerekes (1998.) p.103.