

**ЧАСТИНА 1**  
**МЕТОДОЛОГІЧНІ ПРОБЛЕМИ СУЧАСНОЇ ЕКОНОМІКИ**

**Розділ 1**

**Проблеми розвитку сучасних  
соціально-економічних систем**

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**The international conflict regarding the climate change**

*The article deals with the development of possible mechanism for international conflict of climate change solving. Thus author proposes the creation of international tax agency that would measure the production of all natural resources, which are responsible for the CO<sub>2</sub> emissions. Also all firms who are buying these resources must be taxed and revenues must be distributed taking the emissions per head into account.*

*Keywords: climate change, CO<sub>2</sub> emissions, ecological conflicts, taxes, international tax administration, natural resources.*

**I Introduction**

The Potsdam Institut fuer Klimafolgenforschung (2009), the leading institute in Germany for research on the climate change estimated that in the period between 2000–2050 the emissions of CO<sub>2</sub> equivalents should not exceed in aggregate 1000 billion tons of CO<sub>2</sub> equivalents worldwide to avoid an average worldwide temperature increase of more than 2 degree Celsius [2]. Until 2009 the World emitted just around one third of it. That means if we want to meet the 2 degree Celsius target, the world must reduce its CO<sub>2</sub> emissions by 50% of the level of 1990. Or in other words the world must restrict its emissions for the next 41 years to a maximum of just around 700 billion tons of CO<sub>2</sub> equivalents. The problem is that the emissions per head of CO<sub>2</sub> equivalents and GDP per head are very different in all countries. In all countries we observe a direct correlation between CO<sub>2</sub> emissions and production, even that some countries are more emission-intensive than others. Here we define emission-intensity as relation between GDP measured in monetary units and CO<sub>2</sub> emissions measured in physical units. The resulting problem is then that bargaining processes like in Copenhagen are very complicate to solve. We know that the CO<sub>2</sub> emissions should not exceed a specific limit<sup>2</sup>, we know that the number of population of some countries is huge like in China or India and of others very low like in Fiji or Kiribati. However, the emissions per head are very different mostly depending on the richness of

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<sup>2</sup> Here I assume 700,000 billion tons, at least the number plays no role for the arguments here.

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a country; the total emissions could be very high in high-populated countries, even that their GDP per head is low. In some low-populated countries the emissions per head are high, but the total emissions are low. The situation in Copenhagen was like in an ultimatum game [3], which is well-known in game theory. Here we want to try to find an explanation for the disastrous results of the Copenhagen summit in 2009. In the next chapter we explain the theory and some facts to analyze the problems. Then we will try to explain how to find a way out of the problems.

## II Facts and Model

To make the analysis as easy as possible we take only a few countries into account, which could be seen as representatives for the rest of the world. The following countries are relevant here, Russian Federation, Germany, South Korea, United Arab Emirates, USA, China and Fiji. Here we look only at the values of the total CO<sub>2</sub> emissions and CO<sub>2</sub> emissions per head, CO<sub>2</sub> emissions per monetary unit, percentage of the total world emissions of CO<sub>2</sub> and the rank of the country taken the GDP per head into account. All numbers are for the year 2006.

Table 1<sup>3</sup> – The CO<sub>2</sub> emission situation in sample countries

Country	Total CO <sub>2</sub> emissions in tsd tons	CO <sub>2</sub> emissions per head (tons)	CO <sub>2</sub> emissions per PPP-\$ in kg	Rank; GDP per head in PPP-\$	% of the total world emissions
China	6,103,493	4.00	1.03	127	21.5
USA	5,752,289	18.99	0.45	10	20.2
Russia	1,564,669	10.92	0.86	73	5.5
Germany	805,090	9.74	0.30	36	2.8
South Korea	475,248	9.89	0.44	50	1.7
Fiji	1,610	2.01	0.0005	158	<0.1
UAE	139,553	32.85	0.64	17	0.5

We observe, that the total emissions of the countries are very different, and the emissions per head also, where there is no correlation between these numbers. For example the total emissions of the UAE are relative low, but the emissions per head very high. Contrary to that the total emissions of South Korea are four times higher than in the UAE; the emissions per head just around four times lower as in the UAE. The explanation is that the numbers of population of both countries are very different. What indicator should be taken into account in a bargaining process to lower the total emissions or better to reach the millennium goals? A huge country like the USA emits the same amount of total emissions of China, but per head just around five times more than in China. Would it be just to argue that an American inhabitant is allowed to emit five times more CO<sub>2</sub> than an inhabitant of China? If we take into account the emissions of the past the relationship would be multiplied. For some reasons it seems to be unrealistic that the developed countries would accept that the emissions from 1989 and earlier will be accepted as an argument in negotiations. The problem is that the countries must split up a cake which is fixed, or some countries like Fiji will be strongly damaged; a lot of Fijian islands would vanish forever. Would it be a just idea that threatened countries should bear the burden of climate change? On the other hand the rich countries like

<sup>3</sup> All data are taken from the homepage of the Millennium Development Goals indicators.

Germany, UAE and USA would have to reduce either its production or to invest a huge amount of income to decrease their emission intensity. The problem is that the efforts of countries to reduce the emissions like the USA must be much higher than in China or in South Korea. What would be a fair solution, ignoring that the power of the USA is much higher than Fiji for example. It is like in elections every human should have the same rights, what would mean that every human would have the right to emit as much as all other humans. What does that mean? The share of the cake must be equally distributed to all humans. The US Americans cannot expect that they should have the right to emit more than Russians. So the task is to divide the remaining the 700 billion tons of CO<sub>2</sub> equivalents over 40 years equally. A further problem is how to deal with the population growth? Shall the amount of living people decrease if new humans are born? Or shall it be the case that emissions rights are inheritable?

A thinkable approach would be that all humans should get property rights for the amount of emissions they are allowed to emit. Of course also the trade with these emissions rights should be allowed. That would mean a Fijian would be able to sell emission rights to an US-American. This sounds to be a very complicated mechanism, even that the trade of emission rights is not new and partly introduced regarding CO<sub>2</sub> emissions in Europe between firms. However, this approach bears some risks, at first it could lead to speculation in emission rights, what can be observed in the present in the European market for emission rights. The rich countries could try to exploit poor countries regarding emission rights. For example by making development depend on a compensation measured in CO<sub>2</sub> certificates. If we think about the first years after the end of the USSR, something similar happened with firm shares. After the distribution of the shares to the workers, some smart businessmen from Moscow bought all shares for a very low price. The reasoning is that most Russian workers did not know what to do with their shares. The consequence was the rise of huge oligopolies, which is not very good for market economy as we all know. The same can be expected from countries where the literacy rate is very low.

An easier mechanism would be that an international tax agency would measure the production of all natural resources, which are responsible for the CO<sub>2</sub> emissions. In a next step all firms who are buying these resources must be taxed. If this would be possible the prices for gasoline, heating, coal, plastic products would rise and the aggregate demand for these products would decrease. In a third step the tax revenue must be distributed in some way, my proposal would be that the taxes could be redistributed in the following way. All countries, taking the emissions per head into account, which are emitting less than the allowed level of emissions, would get a higher share of the tax revenue, which should be proportional to the CO<sub>2</sub> savings.

The consequence would be that share of countries like the USA or UAE would be low or zero, where probably countries like China or Fiji would receive a relative high share of the tax revenue. Please note the allowed level of per head emissions should be independent of new generations. To make this point clear, the allowed total emissions will be fixed today. This would have the effect that governments would have an incentive that the population will not grow and remain constant, because population growth is one of the most important environmental problems. To make this point more clear, if a country would have 10 inhabitants each of them are allowed to emit 100 units of CO<sub>2</sub>, then the allowed level for the country would be 1000 units of CO<sub>2</sub>. If the population would increase later on to 20, then the allowed level of emissions is still 1000 units and each of its inhabitants would have then only a level of 50 units. The logic behind this mechanism is that only parents directly influence the number of children and the government has only a little influence on it. If such a mechanism would not exist countries with a high fertility rate would be better off.

Overall, this taxation of the use of natural resources would have some interesting effects. At first the CO<sub>2</sub> life-cycle would become interesting for firms and would lead to the introduction of environmental substitutes or alternatives, because of the high costs of environmental-unfriendly goods. Secondly, the firms would have an interest to improve repair services, because services would become relatively cheaper than new products for the consumer. Secondly, national governments would have an interest to enhance investments in environmental friendly infrastructure, technologies, to give incentives for consumers and firms to reduce the use of natural resources like coal, oil and so on. Thirdly, poor countries like Fiji or India would receive money for such investments. Fourthly, what the governments would do in their country and for what they would spend the additional money, would only be decided by the national governments. The advantage is that the regional possible measures are very different. For example, in Fiji there are no heaters systems because of the high temperature. At least the it is relatively easy to measure of all natural resources, which are producing CO<sub>2</sub> equivalents. It is not necessary to know the tax rate ex ante; it can be adjusted until the optimal tax rate level is reached. This makes the system very flexible. However, this mechanism seems to have some good characteristics, which could help to solve not only the climate change problem. It helps also to reduce population growth and to increase the economic growth without harming the climate. It would create jobs in the service sector and high technology firms. And the mechanism would be fair and just. In principle it is a kind of Pigou tax combined with a distribution mechanism.

### **III Conclusions**

We know that the Copenhagen conference 2009 was more or less a disaster, if we look at the results. However, if the humankind is convinced that the combusting of oil, gas, coal and so on, then a solution must be found in the nearest future. If we will fail than a lot of island countries will vanish and many coastal areas will be damaged. The first problem of the bargaining process in Copenhagen was that the targets with respect to reduction of CO<sub>2</sub> were different for a lot of countries. For example the targets of the European Union were high and the targets of the USA were low. The most threatened countries in the third world were ignored. The first thing what to do, is to think no longer only nationalistic. At first it must be discussed what is a fair and just distribution of the burden, which is caused by the CO<sub>2</sub> reductions. If we really think that all humans are equal, consequently every human should have the right to emit as much as all other humans. Of course that would mean that developed countries have to bear the huge share of the burden, while other countries have to bear a small share. Additionally, we proposed an international tax mechanism, which has many advantages. It relatively easy to implement it, the polluter-pay principle is applied; the national integrity is not influenced, of course except the tax. Poor countries would gain from the tax revenue and also all other countries, which would do something to lower their CO<sub>2</sub> emissions.

All countries would have an incentive to invest in environmental friendly technologies. The indirect effects would be that governments have an incentive to lower the national fertility rate if it is too high, the service sector will gain and the number of working places increased, probably the world income will rise.

1. *Potsdam-Institut* für Klimafolgenforschung : Auf dem Weg zum Einstellen der Emissionen : 2°C-Ziel erfordert mehr als 50 Prozent Reduzierung bis 2050. – 29.04.2009.
2. *Greenhouse gas emission targets for limiting global warming to 2°C*. Nature, doi : 10.1038/nature08017 / [Meinshausen, M., Meinshausen, N., Hare, W. and other]. – 2009.

3. Gueth, W. An Experimental Analysis of Ultimatum Bargaining / W. Gueth, R. Schmittberger, & B. Schwarze // Journal of Economic Behavior and Organization. – 1982. – № 3. – P. 367–388.

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**П.Дж. Штауверманн**

**Міжнародні еколого-економічні конфлікти, пов'язані зі зміною клімату**

У даній статті аналізуються організаційно-економічні механізми та інструменти вирішення проблеми зміни клімату на міжнародному рівні. Автором для аналізу вирішення суперечностей щодо емісії CO<sub>2</sub>, запропоновано вибірку з декількох країн: Німеччина, Російська Федерація, США, Південна Корея, ОАЕ, Китай та Фіджі, що умовно представляють все різноманіття протиріч в світі, пов'язаних зі зміною клімату. Так, наприклад, сумарні викиди CO<sub>2</sub> в Південній Кореї в чотири рази більші, ніж в ОАЕ, проте на душу населення викиди в ОАЕ також в чотири рази більші, ніж в Південній Кореї. Існуючі конфлікти між країнами зі значними викидами на душу населення та країнами зі значними сумарними викидами і низькими подушними викидами призвели до того, що існуючі механізми та переговори в Копенгагені в 2009 р. не принесли очікуваних результатів.

Автор стверджує, що справедливе вирішення проблеми квот та обмежень викидів по країнам полягає в забезпеченні однакових прав на забруднення для усіх людей планети. Це означає, що дозволи на забруднення повинні бути рівномірно розподілені між усіма економічними агентами і «американці не зможуть мати право більше забруднювати, ніж росіяни».

В роботі автором запропоновано механізм екологічного оподаткування, суть якого полягає в створенні міжнародного агентства, яке буде вимірювати та контролювати видобуток природних ресурсів, пов'язаних зі створенням вуглекислого газу. Наступним кроком є впровадження обов'язкового оподаткування для всіх фірм, які купують ці ресурси. Автор розраховує, що ціни на бензин, опалення, вугілля та вироби з пластику внаслідок оподаткування будуть рости, і сукупний попит на ці продукти буде зменшуватися. Всі податкові надходження повинні бути розподілені між країнами, приймаючи до уваги викиди на душу населення. Так країни з меншими викидами на душу населення і викидами менше допустимого рівня, будуть отримувати більш високу частку податкових надходжень. Також висувається гіпотеза розподілу податкових надходжень шляхом встановлення пропорційних коефіцієнтів по країнам, що впроваджують ресурсо- та енергозберігаючі технології по зменшенню емісії CO<sub>2</sub>.

У цілому використання оподаткування природних ресурсів буде мати важливі економічні ефекти. По-перше, життєвий цикл CO<sub>2</sub> буде впливати на господарську діяльність підприємств і стимулюватиме провадження екологічних заміників та альтернативних джерел через високі витрати на «екологічно недружні» товари. По-друге, зросте економічна зацікавленість в розвитку та поліпшенні ремонтних послуг, оскільки послуги стануть порівняно дешевшими, ніж створення нових продуктів для споживачів. По-третє, національні уряди будуть мати інтерес для збільшення обсягу інвестицій в екологічну інфраструктуру, технології, та стимулювання споживачів і фірм, з метою скорочення використання природних ресурсів. По-четверте, такі бідні країни, як Фіджі та Індія будуть отримувати гроші для екологічних інвестицій.

Ключові слова: зміна клімату, емісія CO<sub>2</sub>, екологічні конфлікти, податкові надходження, міжнародна податкова адміністрація, природні ресурси.

**П.Дж. Штауверманн**

**Международные эколого-экономические конфликты, связанные с изменением климата**

В статье рассматриваются научные подходы к решению международных конфликтов связанных с изменением климата. Автор предлагает создание международной налоговой администрации, которая будет заниматься расчетом добычи природных ресурсов, использование которых приведет к эмиссиям CO<sub>2</sub>. Фирмы, которые используют такого рода ресурсы, должны платить налоговые пошлины, а сами поступления перераспределяются между странами зависимости от уровня эмиссий CO<sub>2</sub> на душу населения.

Ключевые слова: изменение климата, эмиссия CO<sub>2</sub>, экологические конфликты, налоговые пошлины, международная налоговая администрация, природные ресурсы.