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Hot air in Kyoto, cold air in The Hague

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Summary

Why did the climate negotiations in The Hague fail? Our contribution is to argue that the conflict between the European Union and the United States stems mainly from disagreement on the cost issue. We argue that three main concerns promoted by the European Union in The Hague, i.e. a 50% national emission ceiling (the supplementarity principle), the use of carbon sinks and an international market control system, can be solved by less restrictions on free GHG trade and by establishing the World Trade Organization as an international authority. Because the US face much higher future reduction costs than the EU, the US will be imposed considerably higher costs than the negotiations in Kyoto were based on. Thus, to make the US stay in an international GHG emission-trading scheme, the EU must reconsider and acknowledge US claims for cheaper reduction options and the right to trade 'hot air.' This point is important. If the US do not participate, the increase in emissions will be much higher than the emission reduction following the EU supplementarity proposal.

Keywords: Hot Air, Global GHG Trade, Kyoto Protocol, The Hague, National Emission Ceiling, Carbon Sink, Control System, Cost Issue, EU, US.

JEL Classification: Q28, H2, H4

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1. Introduction

On November 25, the global climate negotiations in The Hague collapsed. The negotiations in The Hague were a follow-up to the climate agreement in Kyoto, Japan from 11 December 1997. Here, 149 countries signed an agreement that allows countries to trade greenhouse gases (GHG). Out of these 149 countries, 38 industrialized countries (the so-called 'Annex B countries') committed themselves to an emission ceiling and the possibility of trading GHG, for example CO2 emission permits. The EU as a whole committed itself to reduce emissions of GHG by 8% whereas the US must reduce its emissions by 7% (from 1990 to 2012). In total, the 38 Annex B committed themselves to a 5.2 % reduction.[1]

Why did the climate negotiations in The Hague fail? This question, which deals with a most recent event, has not been addressed in literature yet. Our attempt is to do so and extract lessons when considering future negotiations such as the one planned in Bonn.[2] Our contribution is to argue that the conflict between the European Union and the (EU) and the United States (US) stems mainly from disagreement on the cost issue and that it should be solved by fewer restrictions on free GHG trade thus allowing full use of the hot air option.[3] *Hot air* means that the granted quota of permits is higher than actual emission.

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1 While delegates in Kyoto agreed to these emissions reductions targets and methods, it was left for subsequent meetings to decide on most of the rules and operational details that will determine how these cuts are achieved and how countries' efforts are measured and assessed. Although many countries have signed the Protocol, the majority are waiting until these operational details are negotiated before deciding whether or not to ratify. To enter into force, the Protocol must be ratified by 55 Parties to the UNFCCC, including Annex I Parties representing at least 55% of the total carbon dioxide emissions for 1990. Currently, only 30 Parties have ratified the Protocol. ENB (2000).

2 Conference of the Parties at its sixth session (resumed), 16 - 27 July 2001, Bonn, Germany.

3 The six GHG gases included in the Protocol are: (1) carbon dioxide (CO2), (2) methane (CH4) and (3) nitrous oxide (N2O). Also included are three types of chloroflurocarbons (CFCs), namely (4) hydroflurocarbons (HFCs), (5) perflurocarbons (PFCs), and (6) sulfur hexafluride (SF6). EPA (2001).

Basically, the EU had three main concerns in The Hague.[4] First, the EU was reluctant to allow unrestricted trade. Rather, the EU promoted a moral responsibility for national emission ceilings so that each country should reduce 50% of its reduction commitment nationally (the so-called supplementarity principle[5]). In other words, a country cannot meet its target level by buying all the needed quotas from e.g. Russia, which has large hot air holdings.[6]

Secondly, the EU was most reluctant to accept the US claim for allowing the use of 'carbon sinks' in forests and agriculture. These first two points put restrictions on free GHG trade thereby raising reduction costs. Essentially, the breakdown at The Hague can be attributed to different opinions about what was agreed upon in the Kyoto protocol concerning these two points.

Thirdly, the EU was worried that no adequate control system could be put in place sufficiently strong to monitor and enforce the market. This point concerning an effective control system is a general problem that must be solved in any case if a potential GHG market is going to work, see Svendsen (1998) concerning the US national experience on this matter.

In this paper, we focus exclusively on the conflict between the two political main actors, namely EU and the US. Because the US is expected to face higher economic growth than the EU, the Kyoto-agreement will eventually be considerably more restrictive on the US than on the EU.

Regarding the relative bargaining power between these two, it is important to note that in the EU proposal, where trading should only be supplementary to domestic action, trade is expected to be reduced by 200 MtC (compared to unrestricted trade) of which 2/3 is reduced hot air trading. Note that if the US does

4 A summary of the whole event in The Hague is provided by the ENB (2000). See also Woeldman (2001).

5 Zhang (2000): For a selling country: 5% of {(its base year emissions multiplied by 5 + assigned amount)/2} For a buying country: 50% of the difference between its annual actual emissions in any year between 1994 and 2002, multiplied by 5, and its assigned amount.

6 Zhang (2000) and Nentjes and Woeldman (2000) have calculated the effect of the EU proposal on the amount of traded Hot Air.

not ratify the Kyoto Protocol, emissions are expected to increase by 600 MtC! Hence, it is most important to make the US join the agreement. If not, the EU run the risk of provoking a situation with significantly less environmental protection compared to a more politically acceptable solution to the US.

In the next three sections, we will briefly look at the three main concerns in the EU. Section 2 looks at the issue of hot air and national emission ceilings. Section 3 looks at carbon sinks. Section 4 deals with the control system. Section 5 focuses on the cost issue. These analyses lead to a concluding policy recommendation in Section 6.

2. Hot air and emission ceiling

Crucial to our argument is that some countries received 'hot air' permit allocations. 'Hot air' means, for example, that Russia's actual emission level is lower than the number of grandfathered permits. 'Grandfathering' simply means that the property right to emission rights is freely transferred on the basis of certain distribution rules (Tietenberg, 1985). In the case of the Kyoto agreement, GHG emission rights are allocated due to 1990 levels, i.e. historical emission rights.

Nentjes and Woeldman (2000) and Woeldman (2001) argue that since the Kyoto figures were negotiated on the prospect (at least from the side of the US and Russia) of the availability of free access to three flexible mechanisms, the presence of hot air cannot be seen independent of the negotiated target levels in Kyoto. We take the view that countries will only enter an agreement if they perceive that they receive a net gain from participation. Otherwise, on may expect an unstable agreement that is not likely to succeed. This view is e.g. supported by Barrett (1998), Bohm (1999) and Sandler (1997).

Although the hot air provision appears to be a loophole, had it not been created, other Annex 1 countries would have insisted that their own emission constraints should be relaxed. If the use of hot air is restricted, the agreement will no longer be a true commitment because some countries might no longer receive net gains from participation. This argument is supported by the papers of Bohm (1992) and Boom (2000). The latter shows, in a fairly general model, that it is rational for low cost (potentially selling) countries opt for higher emission level and for high cost (potentially buying) to accept a more stringent emission ceiling (compared to the situation without trade) when permit trading is feasible. This is explained by the fact that increases in the total trade volume increases implying lower reduction cost for the buying country and higher total payment to the selling country. The US position in the Hague mirrors this: The original Kyoto results were based on the presumption of free trade, the full and unlimited access to all three flexible mechanisms (i.e. permit trading, joint implementation and clean development mechanism) in the Protocol.

Hot air is important in economic terms. Note, that as a consequence of the predefined target levels, hot air distributions do not affect the desired total emissions reduction compared to 1990 levels. Since trading (including the possibility of hot air trading) only reallocates the reduction responsibility, the overall target of a 5.2% reduction will not be watered down. However, the presence of hot air can mean that countries do not have to undertake real reductions when actual emissions are already lower than 1990 levels. For example, Russia can sell their 25 per cent surplus of permits to the United States, thus relieving the latter of the responsibility to reduce domestic emissions, i.e. total emissions of GHG in Russia dropped by 25 per cent from 1990 to 1995 (from 3.000 million tonnes to 2.250 million tonnes of CO_2 equivalent), UNEP (2000). In other words, this means that Russia in 1995 could sell this extra 25 per cent (corresponding to 750 million permits) without having to undertake any reduction efforts. Also other countries were rewarded by hot air distributions. For example, German reductions have, to a significant degree, been the result of economic restructuring in former Eastern Germany since 1990, while British reductions have been an unintended outcome of privatization in Britain's energy sector (Ringius, 1999, 23).

Let us now turn to the cost effects following the political constraints of hot air and the EU Supplementary principle, respectively, on basis of the figures in Table 1.

Table 1. Costs of meeting Kyoto target for OECD-countries under different scenarios ($MtC)

Reported in:	Without flexible mechanisms (Marginal costs)[a]	Fully flexible Marginal costs[b]	Under EU quantitative restrictions on trade[c]
Clinton adm (1998)	-	14-23	-
Nordhaus-Boyer (1998)	125	11	-
Manne-Richels (1998)	240	70	-
Zhang (2000)	-	9.7	79
Nentjes-Woeldman (2000)	250	-	-
Average[d]	205	27,3	79

a) The marginal costs of meeting the Kyoto target, when no flexible mechanisms are feasible.
b) The marginal costs of meeting the Kyoto target with unlimited access to flexible mechanisms.
c) The marginal costs of meeting the Kyoto target when trade is limited according to EU's supplementarity proposal.
d) The average of column entries.

Source: Compiled by the authors.

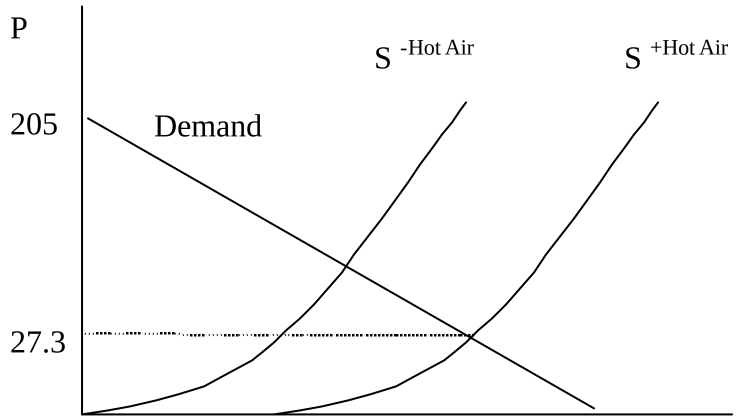
The average figures from Table 1 are used in Figure 1 below. Here, we have illustrated how the presence of hot air affects the permit price. In case of *no trade at all*, the marginal costs of meeting the Kyoto-target amounts to 205$MtC (the average of the marginal cost numbers without flexibility reported in column 2). For any permit price below 205$MtC, there will be a demand for permits. The lower the price, the larger the volume of this demand, as indicated in the figure by a downward sloping demand curve for permits[7]. An *unrestricted permit market*, assuming a well functioning market and a global pollut-

7 The demand curve for permits can be defined as a country's willingness to pay in order to avoid another unit of reduction (which is equal to the marginal abatement cost). The supply curve, the cost of providing another permit is simply the marginal abatement cost, the opportunity costs of reduction. Therefore the supply curve at the first unit of permits is equal to the lowest marginal cost of meeting the Kyoto-target, while the demand curve is the highest cost.

ant, means that each participating country equalizes its MC to the equilibrium permit price.[8] If free trade is allowed, the equilibrium price of 27.3$MtC results.

Part of this trade is attributed to hot air. Since hot air is emission, which can be provided without any costly reduction effort, it can be provided at zero costs, shifting the supply curve to the right. In Figure 1, this is illustrated by a shift in the supply curve from $S^{-Hot\ Air}$ to $S^{+Hot\ Air}$. The effect is that trade increases and equilibrium price is depressed.

Figure 1. How hot air affects permit price



Source: The authors

The problem of hot air only occurs when trading is allowed. An example by Barrett (1998) illustrates this: The US emission cannot exceed 4.6 units, whereas Russia is entitled to emit 2.39 units.[9] Thus, total allowed emission for both countries is 6.99 units. However, due to the economic conditions, Russia is only expected to emit 1.98 units. Hence, the total emission of the two countries will amount to 6.59 units. If trade is allowed, the total emission will reach the

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Permits will be traded until the cost a buying country avoids by emitting one unit more is equal to the cost a selling country incurs of reducing another unit.

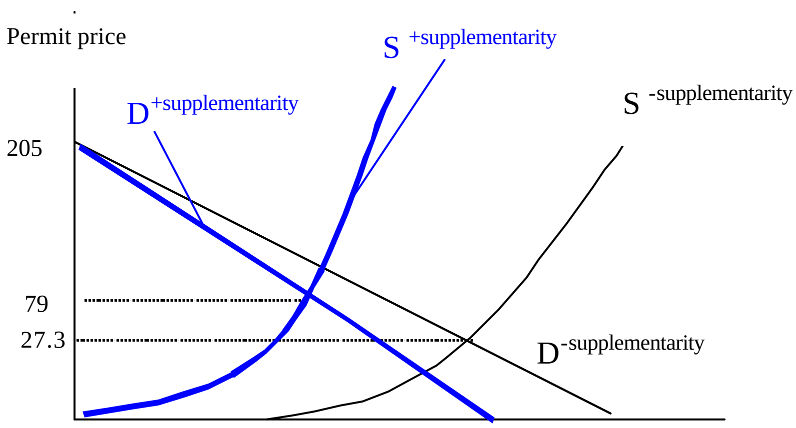
8 The marginal costs under free trade are equal to the permit price under free trade. The reason is that each country can either buy permits or reduce its emission, and it will always choose the cheapest option. In this way, no MC will ever be above the permit price in equilibrium. It cannot be lower either, since then this country could reduce additional and sell with a gain

9 Where a unit is equal to 1 million gigagrams of CO_2.

6.99 units. Consequently, trading eases the total constraint by 0.4 units. The difference between the trading and the non-trading case can now for obvious reasons be referred to as 'hot air'.

In case of the EU supplementarity proposal, restrictions are placed on both supply and demand. Basically, the EU proposal restricts each country's ability to sell or buy, such that it does not exceed 50% of a country's total reduction obligation. We will now show how he EU supplementarity proposal places restrictions on the volume of both demand and supply in each country. For simplicity, we assume in Figure 2 below that this implies a steeper demand curve, due to the reduction in each country's amount of demands.[10] The result being that for each permit price, the total demand is lowered. On the other hand, supply is restricted as well, because each county faces an upper limit on the amount that it is allowed to sell, implying an increased slope of the supply curve.

Figure 2. The EU supplementarity proposal



Source: The authors

According to Table 1, the implication of restricted trade according to the EU subsidiarity proposal is that the permit price increases, in our example to 79$MtC. A part of this reduction concerns hot air. Nentjes and Woeldman (2000) have estimated that this restriction indeed reduces the total hot air quotas

10 Which can be accepted due to aggregation of the countries individual demand-curves.

in circulation by 2/3 and imposes considerably costs on the US. Hence, the EU supplementarity proposal has a strong restricting effect on hot air trade indeed.

3. Carbon Sinks

The change in the concentration of CO_2 in the atmosphere depends both on the emission path but also on the removal of CO_2 from the atmosphere. Hence, measures for removing CO2 from the atmosphere establish another important policy instrument to reach the proposed policy targets. Among the most useful options are reforestation, reduced deforestation and changes in the land use so that the take-up of CO_2 is increased. In total, these measures are referred to as land use, land-use change and forestry (LULUCF).

The cost effect of including LULUFC when meeting the Kyoto-target is clear as it provides yet another option for reducing emission; it will in general lower reduction costs though, according to Stavins (1998), the marginal costs of carbon sequestration rise steeply.

The inclusion of these sinks is, however, as noted by ENB (2000), both complex and controversial. Plants and soils can act as carbon sinks, but the science of estimating how much carbon is being removed from the atmosphere is uncertain. Including the use of sinks in meeting targets on emissions will require a clear definition of a sink, as well as clarity on what changes are the result of deliberate climate policies. Parties must also agree on accounting systems that set the baselines and measure carbon changes. Issues of the permanence of carbon storage achieved through forests and other sinks must also be addressed, given that such carbon can be lost due to felling, forest fires and other factors.

4. Control System

Finally, in response to the third main objection stated by the EU, we suggest that an international control system *can* work. First, it is necessary to establish an international authority. Second, this authority must enforce a sanctions system. Let us look at these two elements in turn.

An international authority that could manage such an international permit trading scheme among governments would be the World Trade Organization. The World Trade Organization is based in Geneva and already covers the 38 Annex B countries. In total, the World Trade Organization has more than 130 members, accounting for over 90 per cent of world trade (WTO, 2000a). It has extensive experience in settling trade disputes and seems to have the necessary sanctions to enforce global permit trade.

Concerning an adequate sanction system, a country's emission of CO_2 can be calculated directly from its total use of fossil fuels. This is administratively much easier than having to get exact emission figures for each firm in the firm-trading scheme. Therefore it is relatively simple to find out, on the basis of production, export and import of fossil fuels, whether the CO_2 emission from a particular country exceeds the amount of CO_2 permits. On the other hand it is more problematic to impose sanctions on a country that tries to cheat. E.g., Russia could be tempted to sell more permits than she is qualified to thus benefiting both from participation and breaking the rules.

The World Trade Organization could impose various sanctions on countries that break the rules. Such sanctions could be trade sanctions, retention of loans, freezing of claims, exclusion from further participation in the market and heavy fines. In fact, the Uruguay Round from 1994 has made it easier to implement such sanctions. Now, it is impossible for a country losing a case to block the adoption of a sanction. Under the previous GATT procedure, sanctions could only be adopted by consensus, meaning that a single objection could block it. Now, sanctions are automatically adopted unless there is a consensus to reject them so that any opposing country has to persuade all other countries (WTO, 2000b).

The total effect of the sanctions must be so significant that it by far exceeds the possible gains from cheating. It is feasible too to renew the permits within a short time period, for example five or ten years, and also to devaluate them if negotiations among the participating countries lead to tighter target levels. It will not pay to cheat if permits are renewed periodically and if cheating countries are excluded from the program, that is, further profitable trade in the future.

If the World Trade Organization can enforce the market, the achievement of the defined target levels will be accomplished. The 38 countries that signed the climate agreement will be given a CO_2 quota of permits corresponding to their emission in 1990. In this way, the number of CO_2 permits in circulation is 'frozen' and the CO_2 emission cannot increase further. Then each individual country will face devaluations of its permit holdings corresponding to the target level for that country.

Devaluation will, at the latest, take place in year 2012 at which time the goal of the CO_2 reduction must be achieved. If the United States wishes to maintain its CO_2 emission at the 1990 level, the United States must buy permits from other countries corresponding to 7 per cent of United States total emission. Countries like Russia, which will reduce and sell CO_2 permits to the economically more developed industrialized countries, are rewarded financially in this way. Countries lagging behind will receive important subsidies to make new investments in order to revitalize outdated and run-down industries. In this way the devaluation of CO_2 permits will ensure that the world as a whole achieves the stipulated reduction in CO_2 emission by the year 2012 (Svendsen, 1998).

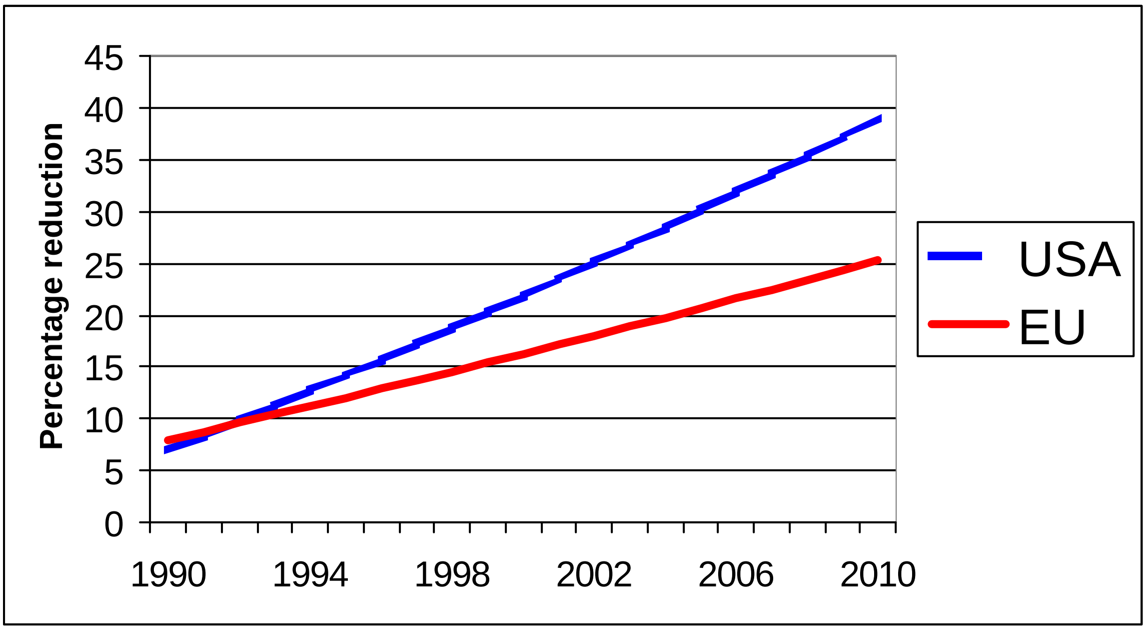
5. Cost Issue

5.1 Cost Scenario

We will now elaborate the crucial cost issue, which seemed to be the most important explanation for the The Hague breakdown. As noted above, the EU is obligated to reduce GHG emissions 8% and the US 7% from 1990-2012. However, when economic growth is taken into account, the US faces a harder restriction the EU expects a 0.8% annual increase whereas the US expects a 1.3%

annual increase in CO_2-emission As shown in Figure 3, this implies that the US, compared to 'Business-As-Usual' (BAU) emission levels, will have to reduce 39.0% to meet their Kyoto target, while the EU, again compared to BAU, only faces 25.3% reduction.[11] Even more striking differences are found in Zhang (2000), with the number 2.6% for EU and 23.1% for US.[12]

Figure 3. GHG reduction from 1990-2010 for EU and US (BAU)



Source: Based on IEA (2000).[13]

The numbers indicate the real reduction implied by the Kyoto agreement, taking into account the national business-as-usual (BAU) growth rate of CO_2-emissions. Thus, in year 2010, the US can expect to reduce significantly more than the EU and is, as such, exposed to higher marginal reduction costs. The EU and the US are roughly situated at the same technological level. Assume therefore, to make things as simple as possible, that the EU and the US face the same marginal reduction cost curve for GHG (MC). The aggregated marginal

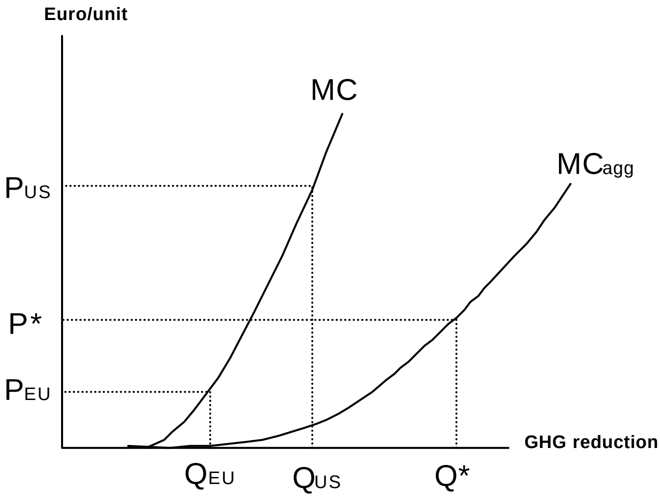
11 The baseline scenario reflects the non-policy case. That is, a situation where, compared to 1990, no specific GHG-emission reductions have been implemented.

12 The figures are not easily comparable, since the figures reported in Zhang (2000) reflect a situation where the EU already has taken some policy measures to combat mitigate CO_2 emissions.

13 Calculated as $((1+x)^{t-1990}-1)*100$+Kyoto reduction, where x is annual projected growth in CO2-equivalent emissions, with t=actual years.

reduction costs for both the EU and the US is labeled MCagg, see Figure 4 below.

Figure 4. Marginal reduction cost curves for the US and the EU, without permit trading



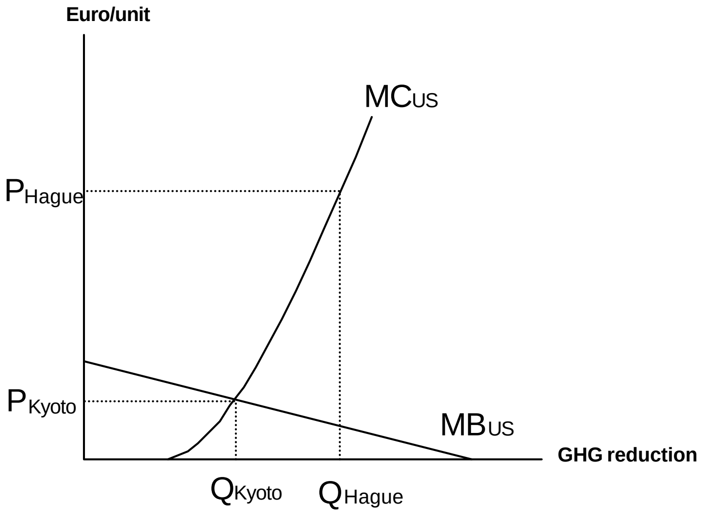
Source: The authors.

Figure 4 illustrates how the US face higher total reduction costs in year 2010 than the EU. It also shows that cooperation (international agreement) makes it cheaper to reduce the GHG amount of Q* = Qeu + Qus at the marginal cost of P*. Figure 4 below indicates that without trading, the marginal costs of meeting the Kyoto-targets are high. The US face the high marginal cost of *Pus*.

Faced with this cost scenario, the US want to add carbon sinks in forests and agriculture to save costs. In other words, the US would get free GHG permits from already existing carbon sinks within the US itself and new reduction options in the future both domestically and internationally. Also, the private good claim of hot air seems to be needed as compensation for less international GHG trade. If e.g. Russia does not get 'extra permits' and is only allowed to trade with the US to a most limited extent, then the gains from trade will diminish. Both Russia and the Ukraine were allowed to stabilize emissions at their 1990 level. This would provide the United States with cheap emission permits to buy and would reward Russia and the Ukraine too by transferring additional foreign currency to them (Daugbjerg and Svendsen, 2001).

The loss from less GHG trade is illustrated in Figure 5 by the triangle above *MBus* and below *MCus*.

Figure 5. Change in US GHG reduction cost from Kyoto to The Hague



Source: The authors.

Note, that the drawn *MBus* curve is hypothetical. Its location and shape are unknown and therefore uncertainty about the net result prevails. The lack of information concerning the *MBus* has probably reinforced the US focus on *MC*.

5.2 Individual net gain

A minimum requirement for participation is that each participant perceives a net gain from entering the agreement. The Kyoto-agreement is a climate change protocol that makes a difference compared to earlier agreements as it incorporates targets and timetables, and especially implies reductions in access of what countries would have done without any co-operation. According to Barrett (1998), such a situation makes ratification highly problematic, as long as questions related to free-riding, non-compliance and the prospect of cost-effective mechanisms remain unsolved.

In contrast, voluntary participation will take place, no matter what the other countries do, if reducing unilaterally is beneficial to an individual country. This case is, for example, known from depletion of the ozone layer. Here, according to Sandler (1997),[14] the US could easily benefit from a unilateral 50% cut-back of CFC-releases. If participation is perceived too costly, no agreement will ever be established. As an example of this, in the forefront of the Second Sulphur Protocol, Denmark had to reduce $S0_2$ emission by 87 percent, which was totally unacceptable for Denmark, since reducing SO_2 by 87 % reduction was twice as expensive as total reduction costs at the 80% level (Steiner and Svendsen, 2000). Similarly, Tietenberg lists a number of pollutants where extensive cost-benefit analyses have been undertaken nationally in the US (Tietenberg, 2000), for example groundwater contamination, diesel odour reduction, wildlife viewing, asbestos, arsenic etc. In contrast to CO_2, the MB curves are pretty well known in such cases.

The fact that the EU wants to ensure that the Kyoto-mechanisms are supplemental to domestic actions has, as mentioned above, resulted in a specific 50% emission ceiling on the use of the three mechanisms to ensure that a balance is achieved between these and necessary domestic actions. It seems that the EU claim has made the former positive US net gain from participation negative. Therefore, future negotiations must seek an instrumental design that makes the US net gain from participation positive. If not, GHG emissions will be increased further.

Zhang (2000) suggests that hot air increases CO_2 emissions by 105 MtC. If, on the other hand, the US choose their BAU instead of the Kyoto-target, CO_2 emissions increase by 423.9 MtC. Nentjes and Woeldman (2000) report that if the US do not ratify, then an GHG increase by 14% will occur (27.3 vs. 31 billion ton CO_2). Hence, the increase in GHG emissions by far exceeds the GHG reduction from limiting hot air trading if the US do not implement their Kyoto target level.

14 Also Montreal Protocol – CFC – Paid the US to act on its own (which they did); Sandler, 1997, p.107).

6. Conclusion

Our main question focused on identifying the main reasons behind the collapsed climate negotiations in The Hague. We argued that three disputed main concerns were promoted by the European Union in The Hague, i.e. a 50% national emission ceiling (the supplementarity principle), the use of carbon sinks and an international market control system. Because the US faced significantly higher future reduction costs than the EU, the US would, given the EU proposal, be imposed considerably higher costs than the negotiations in Kyoto were based on.

The Kyoto agreement was negotiated on the basis of free access to hot air. However, cold air arose among the negotiators in The Hague mainly due to the EU supplementarity proposal, i.e. that each country should reduce 50% of its reduction commitment nationally. This modified design results in higher future reduction costs for the US in particular due to expected higher economic growth than in the EU. We suggest that this political deadlock be solved by fewer restrictions on free GHG trade and by establishing the World Trade Organization as international authority.

Because the treaty implies costly action, the prospect of its success depends crucially on the ability to reach the stipulated targets at minimum costs. In this way, our main contribution is to argue that the conflict between the EU and the US stems mainly from disagreement on the cost issue. If the cost implications following the EU proposal are ignored, the possibility of a total breakdown in future negotiations is severely increased and this will hamper joint efforts to improve global environment. From our analysis, it is evident that the EU supplementarity proposal will reduce hot air by considerably less than the increase in emissions if the US does not participate.

Therefore, there is a strong need to suggest an instrumental design that ensures the US a positive net gain so that the Kyoto target level will be fully accomplished. The net gain to any of the 38 Annex B countries member (individual costs minus individual benefits) should be positive. When negotiations failed in

The Hague, this simple precondition for successful negotiations seems not to have been fulfilled. There must be an individual economic reward for participation.

We recommend, in contrast to the EU, that no supplementarity principle should be implemented and that hot air should be traded freely. Furthermore, in an attempt to lower permit price further, carbon sinks in forests and agriculture should be considered too as an option so that more countries now will get an economic reward from participation. The most appropriate institution for enforcing a global GHG market - another worry within the EU – could be the WTO. Only the WTO seems to possess the needed sanction mechanisms to deter any attempts to cheat.

In essence, compared to the Kyoto agreement, the US is likely to stick to the Kyoto agreement if permit price is minimized by removing restrictions on GHG trade such as the supplementarity principle. Thus, future research should focus more on the cost issue linked to these global climate negotiations. Another interesting point would be to analyze why this difference in negotiation positions occur, i.e. why the US focuses more on the establishment of low-cost permits than the EU.

Thus, to make the US stay in an international GHG emission-trading scheme, the EU must reconsider and acknowledge US claims for cheaper reduction options and the right to trade ‘hot air.’ This point is important. If the US does not participate, cold air among negotiators will stay and the increase in emissions will be much higher than the emission reduction following the EU supplementarity proposal.

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