Policy Oriented Exchange Networks: Was a Copenhagen Climate Treaty Possible?

Scientific Analysis Providing New Insights for Agreement and a Better Treaty for the Planet

Frans N. Stokman[1,2]
[1] ICS, University of Groningen
Netherlands
[2] *Decide* bv
Netherlands
(f.n.stokman@rug.nl)

***Abstract*—This paper presents our predictions for the outcomes of the most controversial issues at the 15th Conference of Parties (COP) Meeting in Copenhagen, December 7-15, 2009. For these predictions we used methodology that was developed at the University of Groningen, The Netherlands, in collaboration with consultancy firm Decide (dutch group). Based on these insights, a completely new strategy was developed, which could have resulted in a stronger treaty and could have created interests that are better harmonized among all states for a better climate and planet.**

Keywords—renewable technologies; Copenhagen climate treaty; exchange networks; policy networks; collective decision-making

I. INTRODUCTION

A. Was a copenhagen climate treaty possible?

The 15th Conference of Parties (COP) Meeting in Copenhagen, December 7-15, 2009 was considered a very fundamental meeting for a worldwide new climate treaty, updating and extending the Kyoto Treaty where most countries accepted obligations to limit their CO_2 emissions to the 1990 level.

We prepared a paper for, handed to the Dutch Minister of Environmental Affairs, and distributed to important policy makers before the Copenhagen conference. Whereas there was a prior strong belief that an agreement at COP Copenhagen was feasible, our analyses showed that this was possible only under specific policy conditions. The most important condition was that the United States, China, India, and Brazil were prepared to accept only voluntary emission reduction measures and no obligatory ones. The outcome of the conference confirmed our prediction: the conference ended in a declaration for emission reduction pledges without committing formal obligations, as proposed by these four countries and South Africa.

Within the context of the Paris 2015 IEEE/ACM ASONAM conference the present paper aims to demonstrate:

1. The relevance of exchange networks as one of the main policy networks (Stokman 2014);
2. The analytic possibilities for revealing policy implications of exchange networks, like positive and negative externalities of bilateral exchanges for third parties;
3. The possibilities for strategic intervention in collective decision-making for better outcomes for certain parties;
4. The analytic possibilities for finding solutions for overall agreement between parties (Stokman et al. 2013).

B. Main Conclusions of the Scientific Analysis of the October 2009 paper.

This paper presents our predictions for the outcomes of the most controversial issues at the 15th Conference of Parties (COP) Meeting in Copenhagen, December 7-15, 2009 (see for the full paper Stokman 2009). For these predictions we used methodology that was developed at the

University of Groningen, The Netherlands, in collaboration with consultancy firm Decide (dutch group). Based on these insights, a completely new strategy was developed, which could result in a stronger treaty and create interests that are better harmonized among all states for a better climate and planet.

Our main conclusions are that the only possible agreement in Copenhagen is the following:

- The treaty in Copenhagen will be acknowledged as an extension of the Kyoto Treaty.
- Rich countries will commit to a 20 to 30 percent reduction of their CO_2 emissions relative to their 1990 emissions, provided that the United States contribution is voluntary.
- Rich countries will be allowed to realize a large proportion of this reduction in developing countries.
- China, India and Brazil are prepared to reduce their dependency on fossil resources substantially, particularly in the industrial, transport, and electricity sectors in line with the demand of the United States, provided that their contributions are voluntary.
- Rich countries will commit limited amounts of money for adaptation in developing countries after 2020.
- The adaptation fund will be considered new money and not linked to the aid budgets of rich countries.
- Developing nations will decide themselves on how to allocate money to projects.

The predicted Copenhagen agreement has several weaknesses. The first weakness is the voluntary basis of the contributions of the United States, China and India, notwithstanding the fact that they are substantially above the ones expressed so far. The second one is the limited size of the adaptation fund and the uncontrolled allocation of its resources by developing countries. The softness of the agreement is due to the fact that the interests of countries are not well aligned, as they are neither shared nor complementary.

A strong agreement requires an element that harmonizes the interests of rich countries, China, India, and developing countries, which can be achieved by incorporating the deployment of renewable technologies in the Copenhagen agreement.

The deployment of renewable technologies in developing countries causes mounting conflicting interests between rich countries and developing ones. Rich countries want to prevent surrogates of new technologies being developed quickly in developing countries, nullifying large development costs. On the other hand, developing countries want to prevent renewable technologies from being expensive for years due to patents. If the agreement summarized above can be linked in a very specific way to a fund for the deployment of renewable technologies in developing countries, the soft agreement could easily be converted into a very strong one. To do so we propose the following construction:

The COP should decide to create a separate fund for the deployment of renewable technologies in developing countries. The size of the fund would be determined by two parameters:

- The more rich countries fail to realize CO_2 reduction in their own countries, the larger the fund.
- The more China, India and Brazil realize a larger CO_2 free component in their growth, particularly in their industrial, transport, and electricity sectors, the larger the fund.
- In addition, the fund is not allocated in money, but in actual realizations of renewable technologies.

Preferably, the sizes of the contributions of rich countries are based on the 2020 CO_2 reductions, as required by IPCC for a fifty-fifty likelihood to keep the world temperature increase below two degrees Celsius. The G20 formulated the two-degree increase explicitly as a goal, which is likely to be reaffirmed in Copenhagen. In doing so, the COP links fund contributions to scientifically required CO_2 reductions, with this explicit goal.

Politics can then be associated with real solutions, not with politically desirable fake ones!

This strategy brings about the following harmonization of interests:

- Rich countries pay more, the less successful they are in realizing their annual and final objectives in CO_2 reduction in their own countries. This gives them an extra incentive for a large CO_2 reduction at home, even when the reduction is voluntary in the United States.
- Developing countries, including China, India and Brazil can deploy less renewable technologies paid by rich countries, the less they contribute themselves to CO_2 reductions in their own countries. This gives them an extra incentive for reductions in their own countries.
- Developing countries can deploy and import new renewable technologies without having to pay for them, even if patents protect them. Moreover, they have all the freedom to make their own choices, conditionally to the renewability of the

technologies. As payment is based on the deployment itself, the likelihood of corruption is considerably reduced.

- The fund and its dependency on the successful realization of CO_2 reductions in both rich and developing countries create a large market for renewable technologies in industry. In any case, there is a large market and the proposed construction guarantees possibilities to include the research and developing costs in the prices through the patent system.
- The more successful the mitigation, additionally supported by the technology acceleration fund, the lower the adaptation fund can be after 2020. Linking the size of the technology acceleration fund to the expected adaptation needs after 2020 would require the technology acceleration fund to be a maximum of about $ 100 billion a year. The actual size depends on how well rich countries fulfil their emission reduction obligations and developing countries succeed in realizing a large renewable growth segment. To give an idea of how these are related to the size of the fund, its size can be summarized as follows for extreme cases (See Table I).

TABLE I.
SIZE OF FUND VS. EMISSION REDUCTION OBLIGATIONS

Size of the technology acceleration fund		***Developing country obligations***	
		Completely fulfilled	No emission free growth realized
Rich country obligations	Completely fulfilled	$ 50 billion	$ 0 billion
	No emission reduction realized	$ 100 billion	$ 50 billion

The proposed solution for the harmonization of interests through the technology acceleration fund aims to increase both the likelihood of a Copenhagen agreement and the later realization of the Copenhagen promises and obligations as well. This is only the case following a number of criteria:

1. Not only new and renewable technologies from rich countries are eligible for the fund, but also ones developed or produced in developing countries. The sole criterion is 100 percent renewable in use, not nullified in the production process.
2. Small-scale solutions should also be eligible, not just large-scale ones. Small-scale solutions are often more efficient and effective in developing countries without proper infrastructure.
3. The fund should not solely be used for deploying renewable technologies, but also to create local infrastructure and expertise for maintenance and replacement.
4. Any combination of renewable technologies should be eligible. Tailor-made solutions often consist of a combination of renewable technologies, using solar, wind, geothermal, water, not-with-food-competing biomass technologies, and maybe even future technologies based on gravitation or the likes.
5. Projects should not be prioritized solely on renewability, but also on them providing solutions to other problems. The major advantage of renewable technologies over fossil-based technologies is that they often solve other

problems simultaneously, such as reduced water use, water desalination and waste processing. The more problems are solved simultaneously, the better the ranking in the pool of project proposals.

II. THE RESEARCH METHODOLOGY

This methodology has been developed and improved in the last 16 years at the Institute for Social Science and Theory and Methodology (ICS) of the University of Groningen in collaboration with the consultancy firm Decide, currently part of the dutch group. It has been applied in a broad variety of contexts, like collective decision-making in complex negotiations at the local, national and international level (i.e. European Union), negotiations between employees and employers, mergers, and new legislation. The study aimed at contributing to an agreement in Copenhagen that is strong and effective in reducing climate change. It aimed to show that applying this methodology could generate fundamentally new insights, also in complex negotiations as the ones in Copenhagen.

The methodology is based on special interview techniques to obtain the required data for computer simulation of the dynamics in complex collective decision-making processes. Firstly, a few experts determine the main issues at stake in a complex decision-making process. Then, experts provide a list of stakeholders that have substantial influence on the outcomes of issues. Finally, experts provide the data for each stakeholder on every issue: its position, salience and potential influence. For the present study, two experts of the Stockholm Environment Institute were interviewed on October 27 and 28, 2009. They specified seven controversial main issues that will be at stake at the Copenhagen COP in December 2009. Computer simulation, partly based on game theory, is used to investigate the expected outcomes and, depending on the goals of the study, strategies for more optimal outcomes. For each issue, the positions are rated on a scale from 0 to 100. On that scale the expected outcome can also be specified. The attached technical appendix contains all issues and the other data the experts provided, a few examples are given below. Moreover the technical appendix shows the analytic results that underlie the above main conclusions.

A. The main data elements

The Parties at COP meetings usually coordinate policies with other parties. It is therefore not necessary to estimate positions and saliences of all Parties. If a Group of Parties coordinates policies and reach similar positions and saliences on the issues, we can take them as a group. Table 1 presents the Party Groups the experts identified and the abbreviations we use in the remainder of this report.

Developing countries coordinate their positions within the Group of 77 (G77). At the establishment of this group in the 1960s, 77 developing countries participated. The name of the group remained the same over the years even though many new developing countries emerged and joined the group. Since the G77 countries are very diverse, the experts identified several subgroups within the G77 and provided data for each of the subgroups rather than for the whole G77.

Table II also presents estimates of the relative influence of Party Groups during the informal negotiation process preceding the final vote. To reach agreement, the vote should be unanimous, but Party Groups differ in the importance they attach to reach an overall agreement. The more importance they attach to an overall agreement, the more they are willing to compromise. We asked the experts to score this on a scale from 0 (not important) to 100 (the Party Group will try to reach agreement with all means to its disposal). The expert ratings are given in the most right column of Table 1. The United States is estimated to have the greatest influence, however they are also very little inclined to make concessions to come to a unanimous agreement. In contrast, the EU is willing to promote unanimity very strongly.

TABLE II

PARTY GROUPS WITH THEIR RELATIVE INFLUENCE AND THE IMPORTANCE THEY ATTACH TO REACHING AN OVERALL AGREEMENT

Party Groups	***Abbreviation***	***Relative Influence***	***Importance Attached to Reaching Agreement***
United States of America	*USA*	100	10
Canada	*Canada*	15	40
Australia	*Australia*	10	50
European Union	*EU*	60	90
Japan	*Japan*	20	60
Russia	*Russia*	5	10
China and India	*China India*	95	70
Brazil	*Brazil*	10	60
Least Developed Countries	*LDC*	30	85
Alliance Of Small Island States	*AOSIS*	30	90
G77 minus LDC, AOSIS, China, India, and Brazil.	*Other G77*	10	65

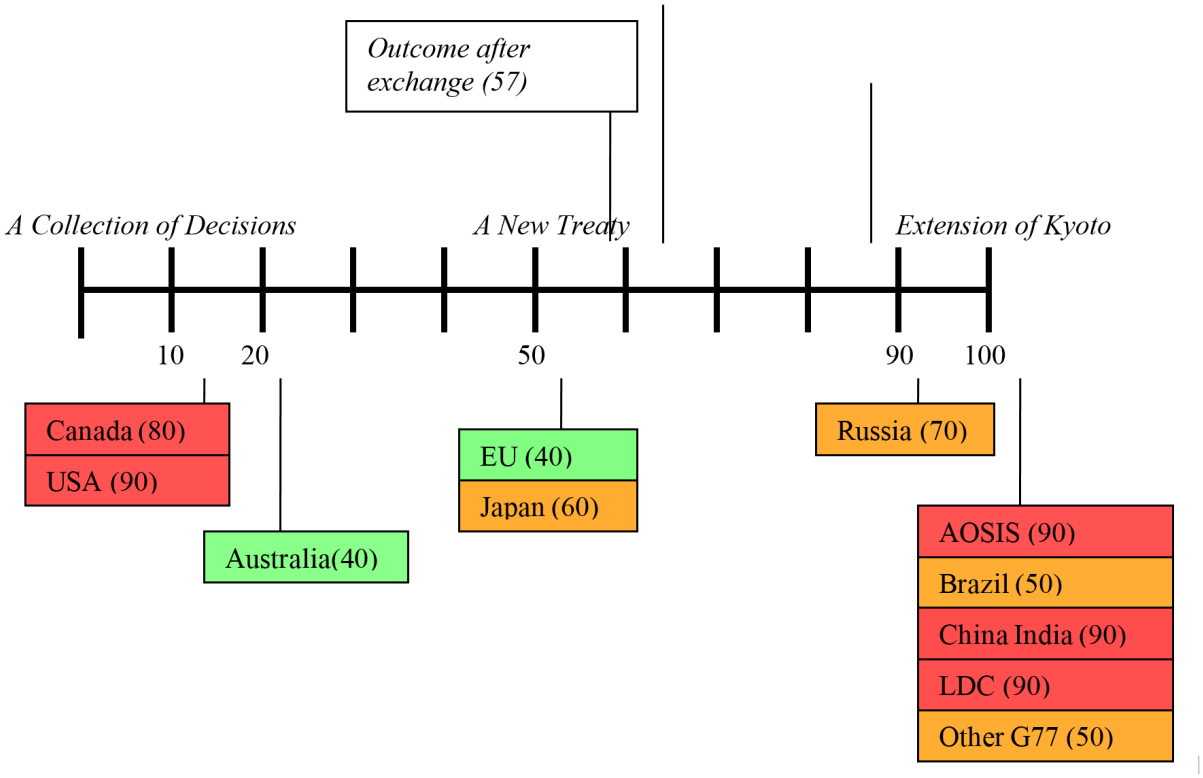

Fig. 1 - Issue 1: New Decisions vs. Extension of Kyoto

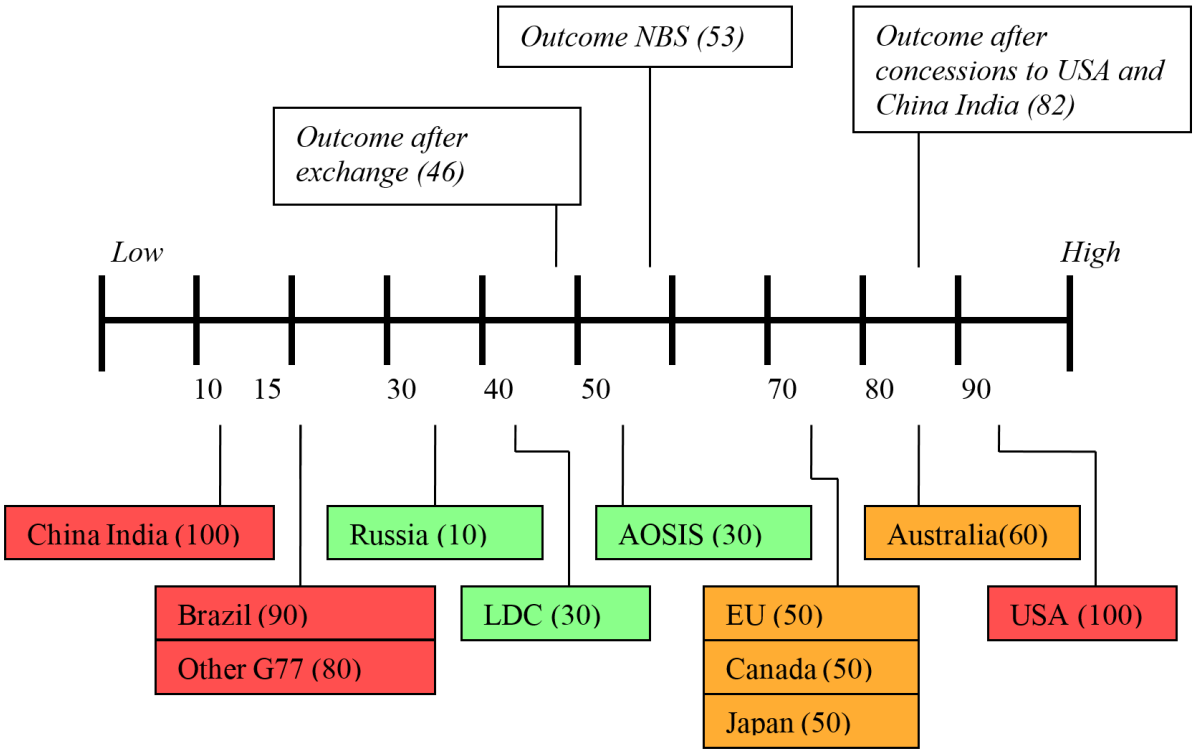

Fig. 2 - MRV CO_2 Reduction in Developing Countries.

III. ANALYTIC STRATEGY

All analyses based on the data obtained on October 27 and 28, 2009 in the interviews with the two experts of the Stockholm Environment Institute revealed that the interests of the Party Groups could not be harmonized in such a way that an agreement could be reached on all issues. Two issues remained unresolved: the state of the decisions in Copenhagen (Issue 1) and the obligations China and India in particular have to meet to reduce emissions in their growth (Issue 4). We therefore wondered whether a strategy could be formulated that fulfilled the following three criteria:

1. An agreement is reached on all seven issues.
2. The agreement is favorable for climate and planet.
3. The interests of the different Party Groups are more aligned so that they all contribute to solving the serious climate problems we will face in the future.

By making two small changes in the data on the basis of solid reasoning, a new strategy can be deployed that meets the three criteria. Issue 1 is mainly a problem for the United States that never ratified the Kyoto Treaty. If the new decisions are classified as an extension of the Kyoto Treaty, the US House and Senate ratification of the Copenhagen agreement implies a ratification of the Kyoto Treaty. Moreover, after eight years of Bush administration, the US cannot easily catch up. Consequently, the US will not likely sign a treaty that implies ratification of the Kyoto Treaty. On the other hand, China and India have high stakes in having a Copenhagen agreement as an extension of the Kyoto Treaty, as rich countries can realize their emission reduction obligations with projects in their countries. The MRV CO2 free reduction in the growth (Issue 4) is especially important to China and India as they are willing to realize such a component in their growth, but are not willing to make binding agreements to do so.

A possible solution could be to accept non-obligatory intentions in both cases, but to put the realizations of CO2 reduction of these countries in the Copenhagen Treaty. Such a double arrangement considerably reduces the salience of the US in Issue 1 and the salience of China and India in Issue 4, which can be investigated by a considerable

reduction of the two saliences in the data. The salience of the US on Issue 1 is reduced from 90 to an arbitrarily chosen value of 70 or lower, such as 50. Simultaneously, the salience of 100 of China and India on Issue 4 is also reduced to 50.

The results are stable as long as the salience of the US is reduced to 70 or lower for Issue 1 and that of China and India to a value of 90 or lower on Issue 4. In doing so, this provides us with very stable results. Now, after bilateral exchanges, sufficient agreement is realized on all issues to arrive at a complete agreement.

IV. Conclusion

In studies of large networks, based on data mining from the Internet, the emphasis often lies on the structure of the network, community formation within such networks and its effects on *individual* opinions. In the present study we studied the effect of an exchange network on the outcomes of *collective* decisions. In collective decision making several social networks are relevant: in persuasion processes information and trust networks dominate, in logrolling processes exchange networks, and in power processes hierarchical networks. Although in each collective decision making context all three processes are likely to take place, often one of them is dominant while the other two play a role in the background. Within the context of international climate negotiations we expected that exchange processes dominate due to the formal voting system of one vote for each country and the large and diverging interests that are at stake. We hope to have demonstrated that a carefully selected type of the dominant social network and analytic procedures can provide far-reaching insights, even within the context of such a complex negotiation process as that among 190 countries.

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