Prevention of 'dangerous interference with the climate system'
without dangerous interference with the world economic system

Beyond Kyoto – A New Global Climate Certificate System

Continuing Kyoto Commitments or GCCS for a Sustainable Climate Policy?

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With a section (VIII.C.) about
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Foreword:

This book shows how mankind can 'prevent dangerous interference with the climate system' without dangerous interference with the global economic system. In the two underlying studies on behalf of the Ministry of Environment and Transport of the German federal state of Baden-Württemberg[1], the results have been elaborated by thorough scientific evaluation of different climate protection systems and intensive development work on an efficient climate protection system. The **results will be presented in 9 chapters** according to the following **nine basic R&D steps**:

1. Quantifying the 'ultimate climate objective' of the world community 'to prevent dangerous interference with the climate system' thus achieving climate sustainability.
2. Development of a comprehensive standard system for evaluating the prospect of success of different climate protection systems.
3. Based on this scientific standard system, evaluation of the current Kyoto system and of the most important proposals for 'incremental regime evolution' of the Kyoto system. Unfortunately, it must be noted that these systems are incapable of achieving climate sustainability.
4. Evaluating three proposals for 'structural regime change' of the Kyoto system.

Following this objective evaluation process and numeric comparison of the different proposals:

5. Description of the eight basic elements of GCCS and its in depth 'critical assessment'.
6. Intensive development and detailed 'implementation description' of the generally preferred GCCS – Global Climate Certificate System – to a climate protection system that can achieve climate sustainability and to a status in principle ready for application.
7. A briefly described and illustrated overview of the GCCS, economic analysis, fairness discussion (per capita approach), legal feasibility and gains and burdens for different countries.
8. In depth discussion of economic, fairness, legal and acceptability aspects of the GCCS.
9. Finally: elements of a strategy to implement and to enforce the GCCS in international politics as an effective 'beyond-Kyoto-I' climate protection system capable of achieving climate sustainability.

In its step-by-step presentation of the results of the underlying studies, this book contains both good and bad news. First the **bad news**: *Apart from explicitly acknowledging the dedicated and intensive work and the achievements of the international climate negotiation community in very difficult negotiations*, there are two somewhat disillusioning results. Based on careful research and an objective standard evaluation system of climate protection schemes, this book has clearly demonstrated the following:

[1]Wicke, L./Knebel, J.(2003a): Nachhaltige Klimaschutzpolitik durch weltweite ökonomische Anreize zum Klimaschutz Teil A: Evaluierung denkbarer Klimaschutzsysteme zur Erreichung des Klimastabilisierungszieles der Europäischen Union. Entwurf Stuttgart/Berlin Oktober 2003. and Wicke, L./ Knebel, J.(2003b): GCCS: Nachhaltige Klimaschutzpolitik durch ein markt- und anreizorientiertes Globales Klima-Zertifikats-System. Teil B: Prinzipiell anwendungsreife Entwicklung des GCCS zur Erreichung des Klimastabilisierungszieles der EU, Stuttgart/Berlin Dezember 2003.

- Neither the current 'Kyoto-Protocol' Global Climate Protection System with (legally binding) commitments by certain states to reduce or limit their greenhouse gas emissions
- nor the various proposals for 'incremental regime evolution' of the Kyoto Protocol by an improvement of its commitment system

are capable of meeting the ultimate objective of the UNFCCC and therefore the core of international climate protection policy, i.e. 'to prevent dangerous anthropogenic interference with the climate'.

And now the **good news**: By implementing the GCCS as the preferred system

- the ultimate climate objective quoted can be achieved,
- developing and newly industrialized countries can be integrated into the world climate protection system by installing a 'fair system' based on the principle of 'one man/one woman – one climate emission right', thus meeting their objectives for (sustainable) development, growth and elimination of poverty, and
- no industrialized nation nor its consumers of fossil fuels will be overburdened.

Just like with all efficient climate protection schemes, extremely high hurdles will without doubt have to be overcome when implementing the GCCS. This system will have to be incorporated into an approved and ratified, reformed multinational climate protection treaty. However, thanks to the important merits of the GCCS, there is still a small chance that mankind will manage to prevent dangerous climate change.

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Executive summary

(Part A: chapter I to IV,)

1. The EU's objective of 'stabilizing carbon dioxide levels at 550ppm CO_2' is an important contribution towards a more concrete definition and implementation of the global aim of climate sustainability by 'preventing dangerous anthropogenic interference with the climate system'. (Article 2 of the UN Framework Convention on Climate Change, UNFCCC)
2. The existing global climate protection system and conceivable – evolutionary or structural – system changes must be primarily measured in terms of their contribution towards this EU objective.
3. This is why in a comprehensive standard system of evaluation of the prospect of success of different climate protection systems the importance of the climate sustainability criterion accounts for 50%, economic efficiency for 18%, technical applicability for 8% and political acceptance for 24% of the maximum score. A comprehensive evaluation on this basis (with a total of 19 sub-criteria–comparison (Ref. Table 1) of all the instruments studied) hence suggests the following.
4. As a result of the increase in CO_2 emissions, which in total continues at a globally (almost) unchanged pace, and further in view of existing serious structural shortcomings (such as far too low emission reductions in industrialized nations only, no globally effective incentives for permanent, climate-friendly development), the existing (Kyoto) climate protection system ***is unable*** to achieve climate sustainability, so that the system is awarded a – poor – score of 37 from a total of 100 possible points.
5. Irrespective of its (badly needed) ratification, this is due mainly to two reasons.
   - The failure to achieve the climate-related targets of the Kyoto Protocol (increasing rather than declining emissions by industrialized nations and continued, strong growth of climate gas emissions world-wide).
   - Structural shortcomings of the system. (It is impossible to solve the world's most expensive environmental problem, i.e. 'the climate-friendly transformation of the entire world economy', with a ('weakest' instrumental) scheme of voluntary national self-commitments. Within such a scheme, the extent of commitments is always on a low cost level for states or private entities – far from the necessary drastic global limitations or reductions of greenhouse gases required to achieve climate sustainability. And: there are no or only low incentives for developing and newly industrialized countries to enter into such a commitment system.)
6. Furthermore, the best of the proposals for the 'incremental evolution' of the Kyoto system, i.e. the 'new multistage approach', is equally ***unable*** to ensure climate sustainability. This system is awarded 51 out of 100 possible points and is hence rated as 'acceptable' only.
7. Structural change in the global climate system through market-orientated incentive instruments with a comprehensive impact is the only way in which climate sustainability can actually be achieved. A global earmarked climate tax would have the weakest climate-relevant effect and would fail to overcome the political acceptance hurdle (52 out of 100 points).

8. The contraction and convergence 'C&C' system (with an equal distribution of emission rights as a ***more long-term*** objective) could be modified to a simplified (C&)C convergence system in order to achieve the EU stabilization target. This approach would have a substantial climate stabilization effect and, also with a view to economic efficiency, technical feasibility and political acceptance, is awarded a 'very good' overall rating with 74 out of 100 points.
9. Another way to achieve climate sustainability is the Global Climate Certificate System (GCCS), where emission rights in the form of climate certificates are equally distributed ***from the very outset*** according to the 'One man – one climate emission right' principle and where overstraining of industrialized nations can be avoided through suitable price control mechanisms. The GCCS receives an 'excellent' score of 84 out of 100 points – by far the best result.

Table 1: Comparison of all climate protection systems studied

		Actual score										
Overall evaluation of climate protection systems according to *main criteria A to D* and their sub-criteria for ensuring fulfilment of the main criteria:	**Maximum score**	**Kyoto Pr.**	**Cont.Kyoto**	**MSA**	**NMSA**	**GTA**	**ETA**	**MSCA**	**CAN's FrW**	**(C&)C**	**GCCS**	**GECT**
Part A: Climate sustainability (actual score ***(xx)):***	***50***	***(4)***	***(12)***	***(17)***	***(23)***	***(11)***	***(11)***	***(11)***	***(12)***	***(42)***	***(45)***	***(27)***
General incentive to reduce the increase in CO_2 in developing countries	**4**	**0**	**1**	**1**	**2**	**0**	**0**	**0**	**1°**	**4**	**4**	**3**
Incentive / compulsion for fast, substantial reductions in industrialized nations	**10**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3***	**5**	**7**	**5**
Fastest possible involvement of developing countries	**4**	**0**	**1**	**2**	**3**	**1**	**1**	**1**	**1**	**4**	**4**	**3**
Financing emission reductions in developing countries	**4**	**1**	**1**	**1**	**2**	**1**	**1**	**0**	**1****	**3**	**4**	**4**
Favouring "early actions" world-wide	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**4**	**0**
Avoidance of emission shifting effects	**4**	**0**	**1**	**2**	**3**	**1**	**1**	**1**	**1*****	**4**	**4**	**2**
Permanent interest in climate-friendly behaviour world-wide	**10**	**0**	**0**	**3**	**4**	**0**	**0**	**0**	**0+**	**10**	**10**	**6**
Quantified climate protection aim of the climate system	**6**	**0**	**3**	**3**	**3**	**3**	**3**	**4**	**3°°**	**6**	**6**	**2**
Avoidance of "hot air" world-wide	**4**	**0**	**1**	**2**	**3**	**2**	**2**	**2**	**1*****	**2**	**2**	**2**
Part B: Economic efficiency (actual score ***(xx))t***	***18***	***(8)***	***(9)***	***(8)***	***(11)***	***(8)***	***(8)***	***(4)***	***(8)***	***(13)***	***(15)***	***(15)***
Cost efficiency: Minimizing global costs	**6**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3***	**4**	**6**	**4**
Flexibility during national implementation (minimizing national costs) and financial assistance for development countries	**5**	**2**	**3**	**2**	**3**	**2**	**2**	**1**	**2***	**4**	**4**	**4**
Considering structural differences in climate-related requirements	**4**	**3**	**2**	**2**	**3**	**2**	**2**	**1**	**2****	**3**	**3**	**4**
Positive economic (growth) impetus	**3**	**1**	**1**	**1**	**2**	**1**	**1**	**0**	**1*****	**2**	**2**	**3**
Part C: Technical applicability (actual score ***(xx))***	***8***	***(7)***	***(6)***	***(7)***	***(7)***	***(2)***	***(2)***	***(0)***	***(6)***	***(5)***	***(6)***	***(1)***
Ability to fit into the international climate protection system and the negotiation process	**4**	**4**	**4**	**4**	**4**	**2**	**2**	**0**	**4°**	**3**	**3**	**0**
Easy applicability and control capability in order to ensure practical functioning	**4**	**3**	**2**	**3**	**3**	**0**	**0**	**0**	**2***	**2**	**3**	**1**
Part D: Political acceptance ***(actual score (xx))***	***24***	***(18)***	***(7)***	***(8)***	***(10)***	***(7)***	***(7)***	***(7)***	***(7)***	***(14)***	***(18)***	***(9)***
Fulfilment of the fairness principles												
- Promotion / non-prevention of sustainable development	**5**	**3**	**2**	**3**	**3**	**1**	**1**	**1**	**2***	**3**	**4**	**3**
- Stronger burden on industrialized nations bearing main responsibility and capable of bearing more burdens	**5**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2***	**5**	**5**	**4**
Political acceptability												
- Acceptance by all key players (groups of players)	**5**	**4**	**1**	**1**	**2**	**1**	**1**	**1**	**1****	**2**	**3**	**0**
- Acceptance by the largest possible percentage of all contracting states	**9**	**8**	**2**	**2**	**3**	**2**	**2**	**3**	**2****	**4**	**6**	**2**
***Total score*:**	***100 max.***	***37***	***33***	***40***	***51***	***28***	***28***	***22***	***33***	***74***	***84***	***52***

Abbreviations: Kyoto-Pr.=Kyoto Protocol; Cont.Kyoto=Continuing Kyoto (Ecofys), MSA=MultiStage Approach, NMSA: New MultiStage Approach; GTA=Global Triptych Approach; ETA=Extended Triptych Approach; MSCA=MultiSector Convergence Approach; CAN'sFrW= CAN's Viable Framework for the preventing of dangerous climate change (C&)C=Contraction and Convergence Model; GCCS=Global Climate Certificate System; GECT=Global Earmarked Climate Tax

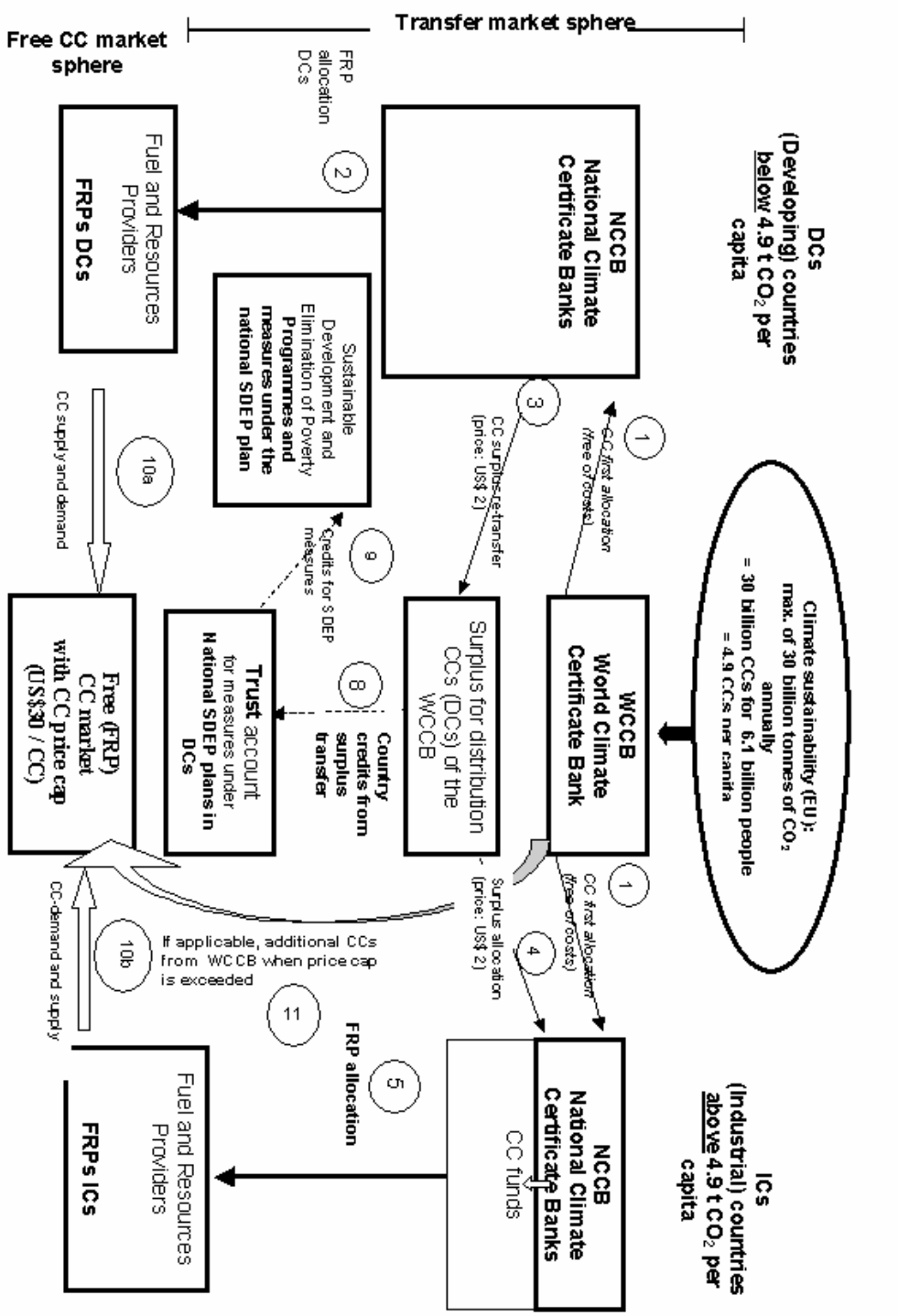
Executive Summary (Part B: Chapters V. to IX)

The main results of the standard evaluation of the various 'Beyond Kyoto' proposals in chapters III and IV, summarized in Table 1, can be described as follows: "Preventing dangerous interference with the climate system" is only possible – by way of structural change of the Kyoto system – with the help of a 'cap and trade' incentive system with a world-wide incentive effect in order to achieve the minimum climate stabilization target as laid down by the European Union in 1996.

10. What is needed is a system which is effective world-wide and which, like (the C&C and) the GCCS (as the clear system of preference) proposed herein,
    - sets forth clearly defined, maximum global emission limits ('cap') on the basis of a quantified climate stabilization target (for example, the EU target of 550 ppm CO_2)
    - ensures a fair and equitable distribution of emission rights to all people (in a manner acceptable to everybody), for example, by distributing climate certificates (CCs) according to the "one man/one woman-one climate emission right" principle).
    - Such a system must include a generally free "cap and trade" emissions trading system as a means to minimize costs.
    - Thanks to this distribution principle, which offers incentives to less polluting countries, the GCCS will for the first time ever enable the active integration of developing and newly industrialized countries into the global climate protection system. But there must be a reasonable limitation of transfers between industrialized and developing countries:
    - The splitting up of the CC market into a fixed-price transfer market (for the trading of surplus and deficit quantities between nations)
    - ***and*** a free CC trading market between fuel and resources providers (with a 'price cap' as an intervention threshold in the case of excessively high price increases)
    - renders the GCCS sufficiently business-friendly, so that no industrialized or newly industrialized country or any company of any industry relying on fossil fuels should be (economically) overburdened.
11. The Global Climate Certificate System thus exactly fulfils a central requirement of the 2002 Environmental Report by the Council of Environmental Advisors: "What would be desirable both from an ecological as well as from an economic point of view is a strictly quantity-related trading system with the largest possible international basis which involves all emission sources and which is based on the first trading level." **(**The first trading level refers to the level of domestic providers producing or importing fossil fuel and resources, authors' note). By addressing the interests of all countries to the largest extent possible whilst at the same time also achieving the European Union's climate stabilization target, this "desirable" system is hence in principle also feasible as a GCCS in political terms.

Chapter VI provides a concise description of the underlying concept of the GCCS and its implementation structure. (Refer to the overview in Fig. 1 overleaf).It must be noted that such a presentation of the GCCS can and should be just a (well-founded and partly detailed) ***illustration*** of a conceivable, actual application. It goes without saying that the GCCS would be modified in many aspects during the course of long and detailed international negotiations. (For a short explanation of the GCCS, please refer to the next 3rd and 4th pages.)

Figure 1: Operation of the GCCS as a climate-stabilizing and at the same time economically compatible 'cap and trade' emissions trading system (key functions)



12. ***Furthermore, the GCCS also includes an important development component***: The 'one man/ one woman – one climate emission right' principle for the first time allows the active integration of developing countries into the global climate protection scheme. As a function of their per-capita emissions which are far below average, developing countries generate revenue: They should restrict the use of this revenue for **'sustainable development and elimination of poverty'** measures in accordance with their national SDEP plans in a manner as climate-friendly as possible. ***Concurrent*** climate protection as well as sustainable development and the elimination of poverty (SDEP) can and should be ensured by the concrete implementation of such plans with the GCCS. What's more, (sustainable) growth in developing countries is not just not obstructed but explicitly promoted.
13. Following a careful evaluation of the proposals so far made for the incremental regime evolution of the Kyoto Protocol (Chapter III) and an evaluation of the two proposals for structural regime change (Chapter IV), i.e. the C&C system which so far only exists as an (interesting) rough concept and the GCCS (now in a form which is 'generally' mature for application), the author is convinced of the following conclusion:
    - ***Should it be at all possible*** – with the author being both sceptical ***and*** hopeful at the same time in this respect – to reduce global climate gas emissions to such an extent that climate stabilization is still possible – ***at least*** – on the level of the ***minimum*** EU target of 550ppm CO_2 in the atmosphere,
    - ***then*** this can only be achieved with the help of a global incentive system in the form of a 'cap and trade' emissions trading system where allocation is substantially based on the 'one man/one woman – one climate emission right' principle.
    - The design of such a system must ensure that it offers developing countries sufficient incentives to join in on the one hand whilst also ensuring the highest possible degree of economic compatibility in order to avoid overburdening any country.

From this perspective, the GCCS concept presented in this book does seem to be the only practicable and promising and at the same time sufficiently operationalised approach towards resolving our planet's climate protection problems in an acceptable manner.

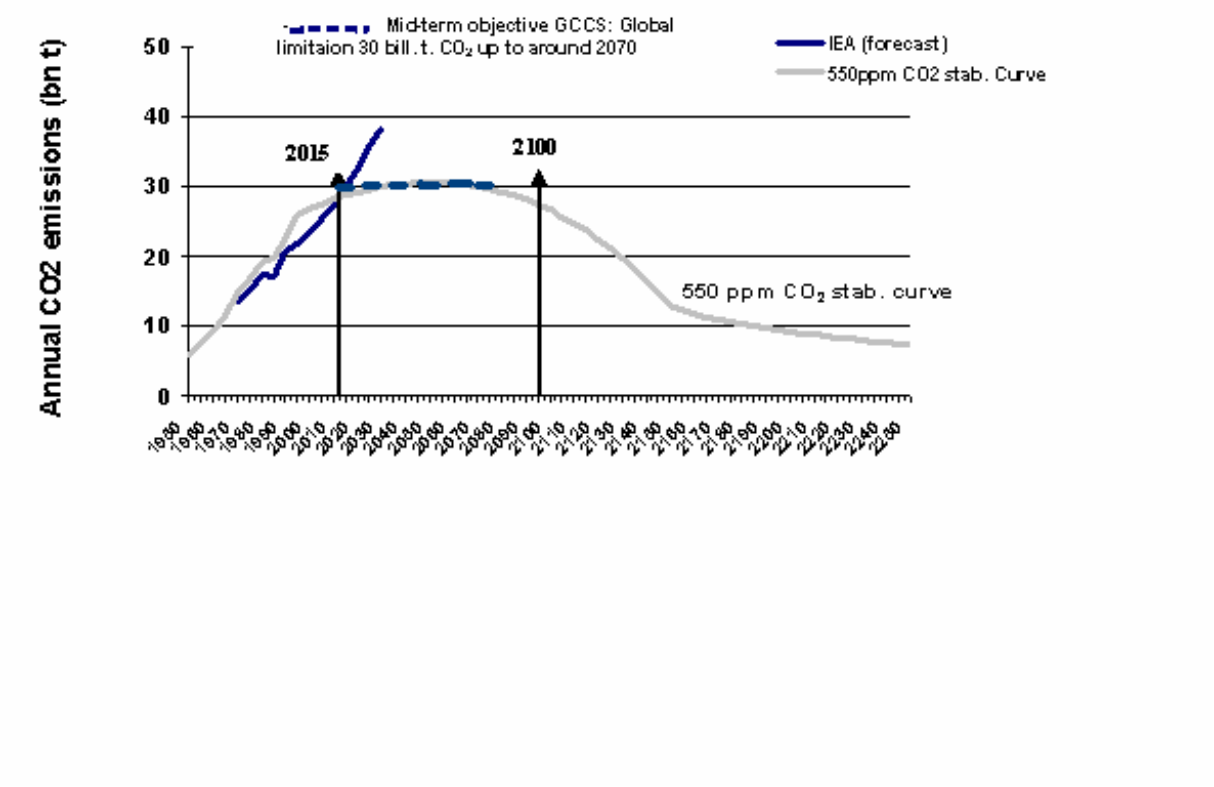
In this respect, the key element of the GCCS, i.e. the principle of 'one man/one woman – one climate emission right' can and should also be used as the crucial key to solving the global climate change problems to the benefit of all the children and children's children of the people currently living on this planet.
The author hope that readers, having read this book – more or less in detail – will be convinced of the correct nature of these – admittedly very demanding – statements.
Annotation for the Ministry for the Environment and Transport of the Federal State of Baden-Württemberg which commissioned this study: The GCCS will not overburden business, industry or consumers in the federal state of Baden-Württemberg in any manner whatsoever! Compared to the (minor) burdens, Baden-Württemberg will benefit from the strong advantages of limiting adverse climate and weather effects to the level which is already apparent and unfortunately unavoidable as well as from a longer-term growth stimulus triggered by more environmentally friendly technologies, applications and processes in the federal state.

A brief explanation of the working mechanisms of the GCCS (objective / key functions)

In 1996 (before the Kyoto negotiations), the European Union defined the level at which 'dangerous anthropogenic interference with the climate system' will occur. This means violating the ultimate objective of Article 2 of the UNFCCC Climate Convention: This said dangerous interference will occur when the concentration of carbon dioxide exceeds a level of 550 parts per million (ppm) – for the majority of climate scientists, this concentration is far too high[2]. But even this goal is very hard to achieve. A global 'cap and trade' system is the only way to ensure that the EU's maximum concentration level is not exceeded ***and*** the most cost-effective solution is achieved. The (red) stabilizing line for 550 ppm in Figure 2 shows how much CO_2 per annum can be emitted globally.[3]. On the basis of this EU objective, the 'cap and trade' – Global Climate Certificate System (GCCS) can be outlined as follows:

1. Global CO_2 emissions and therefore the 'cap' maximum is fixed as of 2015 at around 30 billions tonnes for at least 50 years. Since this amount is almost equal to future emissions as of the year 2015 (according to the International Energy Agency), there will be no global shortage in the beginning. The annual allowance of 30 billion tonnes of CO_2 are represented by 30 billion Climate Certificates (CCs) (refer to Figure 1).

Figure 2: Emissions from 2000 until 2250 aimed at in order to stabilize CO_2 levels in the atmosphere so as to achieve the European Union's 550ppm CO_2 objective (according to IPCC/WRI) and the 'actual' rise of energy-related CO_2 emissions from 2000 until 2030 according to the International Energy Agency.



[2] Refer to I.C.
[3] Refer to I.D.

2. The (few) providers importing or domestically producing fossil fuels and resources (FRPs) require a sufficient number of CCs in order to cover CO_2 emissions resulting from their trading of fossil fuel products. Unlike the European Emission Trading System, the GCCS starts at the first level of trading, i.e. at the level of domestic fossil fuel and resources providers, importing or producing, and this constitutes a significant simplification of the emission trading system.
3. The CCs valid for each year are distributed free of charge on the basis of a generally fair distribution key of 'one man/one woman – one climate emission right' in proportion to the population figure of a certain ***fixed*** reference year. These CCs would represent 4.9 tonnes of CO_2 per capita - for example, 400 million tonnes for Germany and 4.9 billion tonnes for India. Developing countries would be able to sell their surplus CCs. Industrialized countries would have to buy CCs in order to continue producing and/or consuming as before.
4. On a global scale, this would create an enormous incentive for sustainable development. By implementing the GCCS, developing countries would be able to sell large quantities of CCs over several years whilst industrialized nations would have to buy fewer (expensive) CCs. But this 'text book'-type of 'cap and trade' would lead to enormous multi-billion dollar or euro transfers from industrialized to developing countries. This, in turn, would lead to unbearable and unacceptable disturbance of the world economy. This is why the GCCS requires a division of markets as follows.
5. On a ***transfer market between_states*** (via a World Climate Certificate Bank, WCCB), developing countries would sell their surplus CCs for US$2 per CC to industrialized nations. On the basis of the total amount of CCs (based on the country's population) allocated free of charge to the National Climate Certificate Banks (NCCBs) plus the CCs returned by developing countries (surplus re-transfers for US$2), the NCCBs supply their FRPs on the basis of their demand proven for the previous year. (The FRPs hence receive a reasonable basic supply). If the price of the CCs is passed on to consumers, this would add around US$0.005 to the price of a litre of petrol.
6. On the ***free CC market between FRPs***, FRPs have to buy additional CCs if they wish to sell more fossil fuels and resources (for example, due to expanding business) and if this demand is not covered by their basic supply of CCs as shown in 5. (Since developing countries have per capita emissions far below the global average, their (potentially climate friendly) development cannot and should not be restricted. Therefore developing countries need more CCs and the re-transfer of surplus CCs to industrialized nations will decline anyway over the course of time.) In order to prevent any 'skyrocketing' CC prices on the free market, the WCCB sells a sufficient quantity of CCs at an initial free market price of US$30 per CC - a maximum price or a 'price cap' on the free market that will prevent any overburdening of economies and consumers. (This price cap and the transfer price as stated in 5. will be raised every 10 years in order to boost incentives for climate-friendly 'action' on a global scale.)
7. Developing countries can only use the revenue from their sale of surplus CCs to finance measures in line with climate-friendly 'sustainable development and elimination of poverty' rooted in 'SDEP' plans which are developed on a national level and approved on a supra-national scale.

8. Efficient measures to supervise and control the amounts of fossil fuels and resources sold according to a 'simplified IPCC reference system' and to protect against fraud and corruption in implementing SDEP measures and programmes will warrant correct implementation of the GCCS both in industrialized and in developing countries.

Figure 1 shows how the elements interact. As already noted, chapter III describes all the key elements in such detail that the authors consider the 'GCCS to be in a condition generally ready for application'. The GCCS largely embodies almost all important wishes, apprehensions and constructive proposals from both industrialized and developing countries as far as flexible mechanisms within the Kyoto Protocols are concerned. The GCC system will, of course, be modified in many respects during the course of potential international negotiations.