

# Contraction and Convergence (C&C) Climate Justice without vengeance

Contraction & Convergence or 'C&C' © ©

## Aubrey Meyer's achievement 1989 - 2012

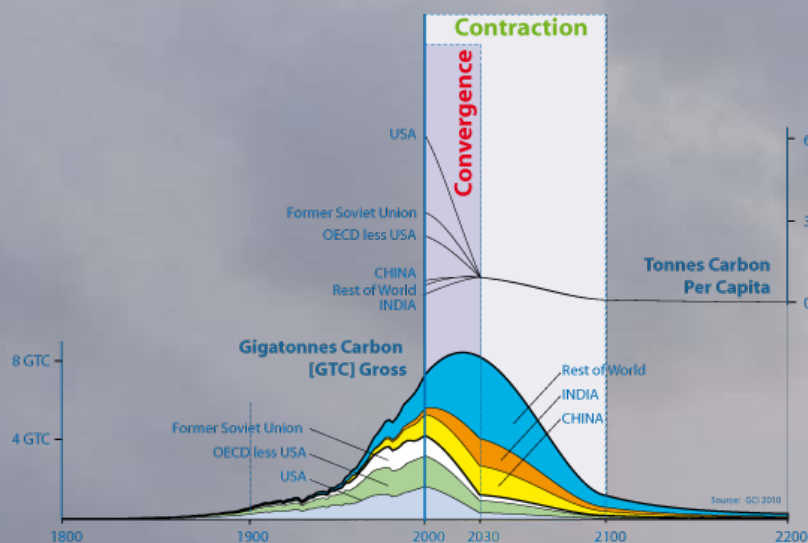
*"The C&C concept and campaign has created a global standard that is now widely recognized as an outstanding and essential contribution to the global debate on what to do avoid dangerous rates of climate change."* [2009 - Ross Garnaut]

Twenty five years ago Aubrey Meyer became very concerned about global climate change. To deal with this, he gave up a successful career as a musician, founded the Global Commons Institute [GCI] and created the now famous '**Contraction and Convergence**' [C&C] proposal.

Since 1989 he has campaigned with utter dedication and great success to win the acceptance of C&C as a basis on which all nations can cooperate to achieve compliance with the objective of the UN Framework Climate Change Convention [UNFCCC].

C&C is a scheme for the nations of the world to negotiate a united agreement to limit global climate change and protect the global commons of the atmosphere by: -

1. Calculating a global emissions budget that results in compliance with the limit referred to in the objective of the UN Climate Convention and
2. Internationally allocating shares in that budget where it is assumed that everyone has an equal right to shares in it, if achieved at a negotiated rate and
3. Making 'Green Growth' or 'Ecological Recovery' a function of that agreement.



This example shows regionally negotiated rates of C&C.  
It is for a 450ppmv Contraction Budget, with Convergence by 2030.

Thus, the C&C scheme provides a 'road-map' by which nations can agree on a C&C path which enables the poorer to grow and the richer to reduce in tandem, so that over the negotiated time-scale, all can achieve compliance with the objective of the UNFCCC in terms of its principles or 'Precaution' and 'Equity'.

The scheme has been dubbed '*Climate Justice without Vengeance*' and due to Aubrey's extraordinary efforts it is now the most widely cited and increasingly the most widely supported model for negotiating UNFCCC-compliance. It is also recognized that C&C will form the basis of any future 'climate deal' the UN must make: - [http://www.gci.org.uk/UNFCCC\\_Submission\\_Co-Signatories.html](http://www.gci.org.uk/UNFCCC_Submission_Co-Signatories.html)

*"Contraction and Convergence is a very powerful idea and we are moving remorselessly towards it."* [2002 - Michael Meacher former UK Environment Minister.]

Some of the recognition for Aubrey Meyer's efforts is recorded here, starting with twelve previous Blue Planet Award winners.

## Professor Norman Myers [2001]



**Professor Norman Myers**  
**Nomination of Aubrey Meyer for C&C Campaign**

*This remarkable 'Contraction and Convergence' campaign has been almost entirely due to Meyer's personal efforts. He has conceived the ideas, he has developed them, he has formulated the policy responses, and he has taken them to governments, agency bureaucracies, international bodies, NGOs, media and whoever else would listen to his persuasive message. He has gained access to dozens of ministers and other top-flight officials. He has accomplished all this from a small office in London with an annual budget average of less than £10,000.*

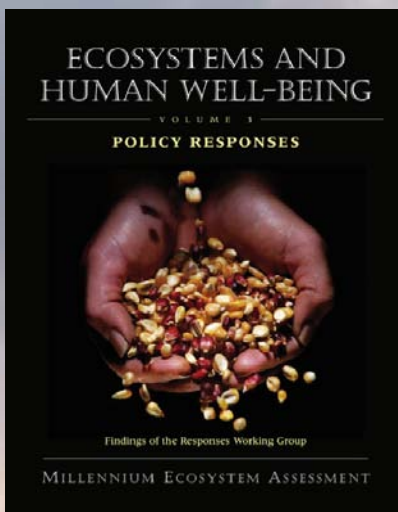
*For this work, Meyer was awarded the 1997 British Environment Media's 'Andrew Lees Memorial Award' with following citation: -*

*"Aubrey Meyer, almost single-handedly and with minimal resources, has made an extraordinary impact on the negotiations on the Climate Change Treaty, one of the most important of our time, through his campaign for a goal of equal per capita emissions, which is now the official negotiating position of many governments, and is gaining acceptance in developed and developing countries alike."*

## Professor Norman Myers Nomination of Aubrey Meyer for C&C Campaign

[http://www.gci.org.uk/Documents/Myers\\_Nomination\\_Meyer.pdf](http://www.gci.org.uk/Documents/Myers_Nomination_Meyer.pdf)

**Sir Robert Watson Fomer Chairman IPCC [2010]**

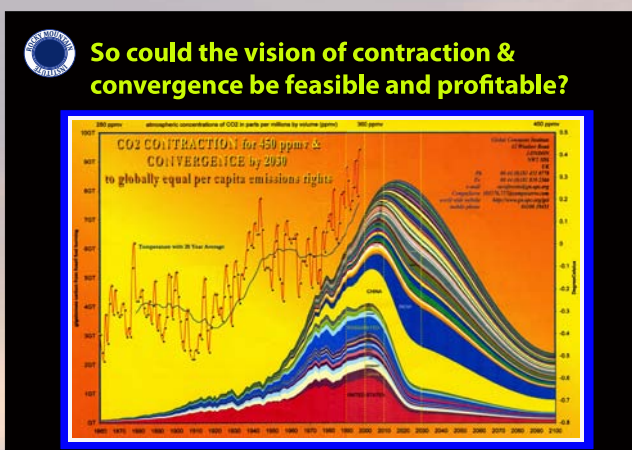


An approach receiving significant attention, endorsed by the German Advisory Council on Global Change, is some form of **'Contraction and convergence'** whereby total global emissions are reduced (i.e., contraction) to meet a specific agreed target, and the per capita emissions of industrialized and the developing countries converge over a suitably long time period, with the rate and magnitude of contraction and convergence being determined through the UNFCCC negotiating process. "Contraction and Convergence" (C&C).

***'Contraction and convergence'*** is a science-based global climate-policy framework proposed by the Global Commons Institute (GCI) with the objective of realizing "safe" and stable greenhouse gas concentrations in the atmosphere. It applies the principles of precaution and equity, identified as important in the UNFCCC but not defined, to provide the formal calculating basis of the C&C framework.

**UN Millennium Project on Environmental Sustainability & Energy R. Watson Chair IPCC & Chief Scientist, World Bank**  
[http://www.qci.org.uk/Documents/Watson\\_2004\\_.pdf](http://www.qci.org.uk/Documents/Watson_2004_.pdf)

## Amory Lovins [2007]



*The equitable vision of 'Contraction and Convergence' where all countries have the same carbon emission rights per person and everyone continues to get richer, especially in developing countries, could head for carbon reductions around 90% over the next century.*

*Could that grand vision of a richer, fairer, cooler and safer world actually be feasible and profitable?*

ASAHI GLASS Blue Planet  
Lecture Amory Lovins 2007

[http://www.qci.org.uk/Documents/Asahi\\_2007\\_Lecture\\_Lovins.pdf](http://www.qci.org.uk/Documents/Asahi_2007_Lecture_Lovins.pdf)



## Professor William Rees [2012]



At a meeting of the World Federalists, guest speaker Dr. William Rees gave this speech standing, without notes. It shines with clarity, developed from decades of lecturing, in the field of his passion, which he himself developed – the “ecological footprint.” Rees is a professor at the University of British Columbia, Canada – and a Fellow of the Post Carbon Institute.

It is no exaggeration to say that Bill Rees has taught and inspired at least two generations of students, ecologists, and environmentalists around the world. Here he outlines the condition of humanity on a small planet, with thoughts on how both can survive.

The recording is from April 14th, 2010 at the Unitarian Church in Vancouver.

*The really inconvenient truth, which we do not wish to discuss, and certainly is not on any political platform to date, are these ones. This is actually a statement from the World Business Council on Sustainable Development, or at least the output from a workshop they held in the early '90's in Antwerp, Belgium. Looking at the data on material resource trends, pollution around the Earth, matching this against production and carrying capacity, that workshop concluded that in the industrial world, reductions of up to 90 percent would be required by the middle of this century, in order to enable necessary growth to occur in the Third World, and to keep the whole within the carrying capacity of the planet.*

*This is now a version of what we call ‘**Contraction and convergence**’ We in the rich countries have got to slow down. In fact reduce our consumption to create the ecological space necessary for those who deserve to grow, so that they can come up to a decent standard. Keep in mind there are now officially a billion people on Earth who are malnourished, that’s calorically malnourished.. And probably another two billion who are deficient in some dietary standard or other. We don’t notice, because we’ve always had plenty in this resource-rich part of the planet. But the fact is, about half the people on Earth are still living the Malthusian dilemma. Just based on our consumption date, we in North America should be designing an economy that uses 80 percent less in absolute terms in order to create the space for others to gain their fair share.*

*‘**Contraction and convergence**’ has to be the way, if you are going to have equity on a single planet, and sustainability at the same time. We should be designing a smaller, equitable steady-state economy, that maintains itself within the carrying capacity.*

**Professor William Rees School of Community and Regional Planning at the University of British Columbia (UBC)**

<http://www.gci.org.uk/Documents/Rees.pdf>

## Matthis Wackernagel [2012]

**PHILOSOPHICAL  
TRANSACTIONS  
OF**

**THE ROYAL  
SOCIETY**

**B**

**BIOLOGICAL  
SCIENCES**

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**Shrink and share: humanity's present and future Ecological Footprint**  
 Justin Kitzes, Matthis Wackernagel, Jonathan Loh, Audrey Peller, Steven Goldfinger, Deborah Cheng and Kallin Tea  
 Phil. Trans. R. Soc. B 2008 363, 467-475  
 doi: 10.1098/rstb.2007.2164

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**References** This article refers to 7 articles, 2 of which can be accessed from:  
<http://dx.doi.org/10.1098/rstb.2007.2164>  
**Rapid response** Respond to this article  
<http://dx.doi.org/10.1098/rstb.2007.2164>  
**Email alerting service** Receive free email alerts when new articles cite this article - sign up in the box at the top right-hand corner of the article or click here

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*“The current state of global overshoot highlights the need for analysis and strategy to bring the human economy within the limits of the biosphere.*

*Similar concerns about global emissions of carbon dioxide have led to a conceptual framework for reducing these emissions known as ‘**Contraction and convergence**’.*

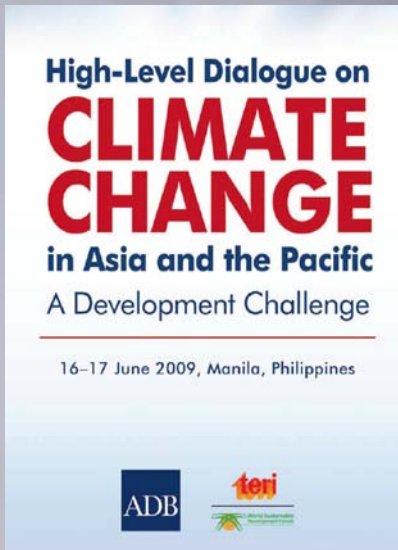
*First described by the Global Commons Institute (Meyer 2000), ‘**Contraction and convergence**’ proposes a framework for stabilizing atmospheric carbon dioxide concentrations through two complementary approaches:*

*Contraction. The need to reduce humanity's carbon dioxide emissions to a level that will result in the eventual stabilization of atmospheric carbon dioxide at an agreed-upon level (e.g. 550 ppm).*

*Convergence. The need to collectively negotiate how this reduction in greenhouse gas emissions will be allocated between nations.*

*Since its initial debut, the contraction and convergence framework has gained increasing recognition and sponsorship from decision makers, particularly in Europe. Influential organizations such as the European Parliament have passed resolutions using ‘**Contraction and Convergence**’ as a basic principle (e.g. European Parliament 1998).”*  
**Shrink and share: humanity's present and future Ecological Footprint Justin Kitzes, Matthis Wackernagel, Jonathan Loh, Audrey Peller, Steven Goldfinger, Deborah Cheng and Kallin Tea**  
[http://www.gci.org.uk/Documents/Footprint\\_RS\\_.pdf](http://www.gci.org.uk/Documents/Footprint_RS_.pdf)

## Emil Salim [2006] and Maurice Strong [1995]



*"The framework of 'Contraction and Convergence' provides a flexible methodology to address the problem of allocation of emission rights. The contraction of overall world emissions pursued along with the convergence of countries' average per capita emissions, allows developing countries to partake of the carbon budget. The per capita entitlements approach is an effective one in that it takes into account historical responsibility and is based on the egalitarian distribution of the commons, within which international justice positions of causal responsibility such as the 'polluter pays principle,' come in."*

### "High Level Dialogue on Climate Change" on C&C

**Emil Salim** - Minister of the Republic of Indonesia; Head of Indonesia Delegation for UNFCCC, Chair 10th UNSD, PrepCom World Summit.

**Maurice Strong** - Member of US National Academy of Science; Under Secretary General of the UN; Senior Advisor to President World Bank; Board Member World Economic Forum; Exec Director UNEP;

Ursula Schaefer-Preuss - Vice President of ADB

Haruhiko Kuroda - President and Chair ADB Board

Ban Ki-moon - Secretary General of the United Nations

Rajendra Pachauri - Director of TERI, Chair IPCC

Yvo de Boer - Former Executive Secretary UNFCCC

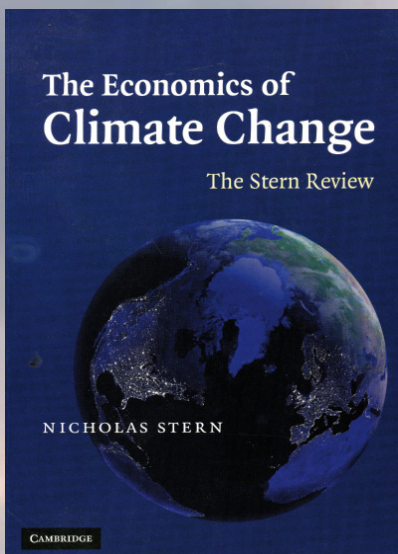
Gloria Macapagal Arroyo - President Philippine

Zhou Dadi - Chief national energy strategy, People's Republic of China

Full Signatory List

[http://www.gci.org.uk/Documents/ADB\\_Full\\_Signatory\\_List\\_.pdf](http://www.gci.org.uk/Documents/ADB_Full_Signatory_List_.pdf)

## Professor Sir Nicholas Stern [2009]



*The notions of the right to climate protection or climate security of future generations and of shared responsibilities in a common world can be combined to assert that, collectively, we have the right only to emit some very small amount of GHGs, equal for all, and that no-one has the right to emit beyond that level without incurring the duty to compensate. We are therefore obliged to pay for the right to emit above that common level. This can be seen as one argument in favour of the 'Contraction and Convergence' proposition, whereby 'large emitters' should contract emissions and all individuals in the world should either converge to a common (low) level or pay for the excess (those below that level could sell rights)."*

Source: 'Contraction and Convergence' <sup>TM</sup>

(C&C) is the science-based, global climate policy framework proposed to the UN since 1990 by the Global Commons Institute (GCI)

### The Economics of Climate Change - Nicholas Stern on C&C

[http://www.hm-treasury.gov.uk/d/chapter\\_2\\_technical\\_annex.pdf](http://www.hm-treasury.gov.uk/d/chapter_2_technical_annex.pdf)

## The web-site of the Global Commons Institute [GCI] is here: -

<http://www.gci.org.uk>

More extensive evidence supporting claims C&C as the most widely cited & arguably the most widely supported model in the UN negotiations on climate change and the debates these have given rise to.

**endorsements page:** -

<http://www.gci.org.uk/endorsements.html>

**endorsements all:** -

[http://www.gci.org.uk/Documents/endorsements\\_high\\_res\\_.pdf](http://www.gci.org.uk/Documents/endorsements_high_res_.pdf)

**support page:** -

<http://www.gci.org.uk/support.html>

**awards page:** -

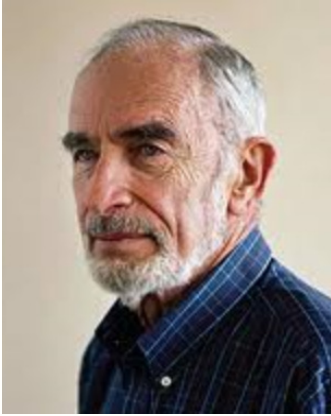
<http://www.gci.org.uk/awards.html>

**publications page:** -

<http://www.gci.org.uk/publications.html>



## Paul Ehrlich [1999] and James Lovelock [1997]



Sir Paul Ehrlich  
Optimum Population Trust



Sir James Lovelock  
Optimum Population Trust



Transition to Sustainability:  
Towards a Humane and Diverse World  
W.M. Adams and S.J. Jeanrenaud



IUCN



Ashok Khosla  
Former Chairman IUCN

OPT recommends: - *"The principle of 'Contraction and Convergence' (rich and poor converging towards a common per person emissions target) be accepted as an equitable starting point for distributing total tolerable carbon emissions, provided that this is allocated to states on the basis of their population size at a specific date.*

*This would encourage the adoption of population restraint policies; whereas allocation on a simple per person criterion would encourage continued population growth, thus continuously reducing every person's carbon entitlement."*

Statement endorsed by: -

1. **Prof Paul Ehrlich**, Population studies, Stanford University\*
2. **James Lovelock**, Gaia scientist and author
3. **Prof Norman Myers**, Fellow, Green College, Oxford University\* and eight other eminent actors.

**The Optimum Population Trust on Contraction & Convergence'**  
[http://www.gci.org.uk/Documents/OPT\\_Statement\\_on\\_Climate\\_Change1.pdf](http://www.gci.org.uk/Documents/OPT_Statement_on_Climate_Change1.pdf)

### **IUCN Re-conceiving growth: 'Contraction and Convergence'**

*In order to achieve fair shares of the global resources available, theories of growth need to be transformed to theories of 'Contraction and Convergence', to balance the increases in energy and material use that are needed to raise living conditions among the poor against contractions among the wealthy and super-rich. There is a growing interest in ideas of 'degrowth' (décroissance). Degrowth is a term created by radical critics of growth theory intended to make space for alternative projects as part of post-development politics. Degrowth is (like sustainability) an ethical concept of how the world needs to change. Proponents of contraction want 'to create integrated, self sufficient and materially responsible societies in both the North & the South'. Rich countries need to see ways forward that maintain quality of life, while shedding the habits and structures that damage the biosphere & corner an unfair share of the resources needed by the world's poor.*

**IUCN - Transition to Sustainability: Towards a Humane & Diverse World J Jeanrenaud W M Adams**

<http://www.gci.org.uk/Documents/IUCN.pdf>

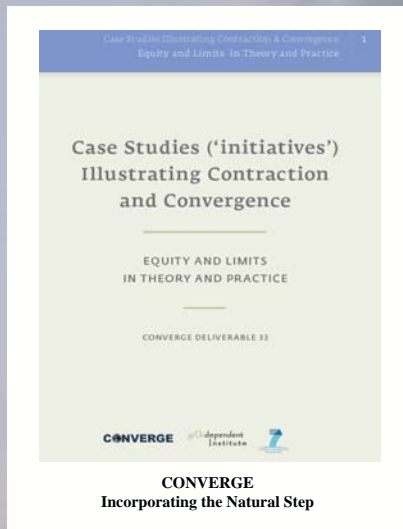
### **IUCN [1993] Former Chairman Dr Ashok Khosla**

*The Report considers possible future implications by presenting three brief scenarios: (1) business as usual (leading to a tripling of global annual resource extraction by 2050); (2) moderate 'Contraction and Convergence' (requiring industrialized countries to reduce their per capita resource consumption by half the rate for the year 2000); and (3) tough 'Contraction and Convergence' (aimed at keeping global resource extraction at its current levels). None of these scenarios will lead to actual global reductions in resource use, but all indicate that substantial reductions in the resource requirements of economic activities will be necessary if the growing world population can expect to live under conditions of sustainable resource management. The key message of the tough scenario is that despite population growth to roughly 9 billion people, the pressure on the environment would remain roughly the same as it is now. The emissions correspond approximately to the lowest range of scenario B1 of the IPCC SRES, but are still 20% above the roughly 5.5 GtC/yr advocated by the Global Commons Institute for 'Contraction and Convergence' in emissions (GCI, 2003).*

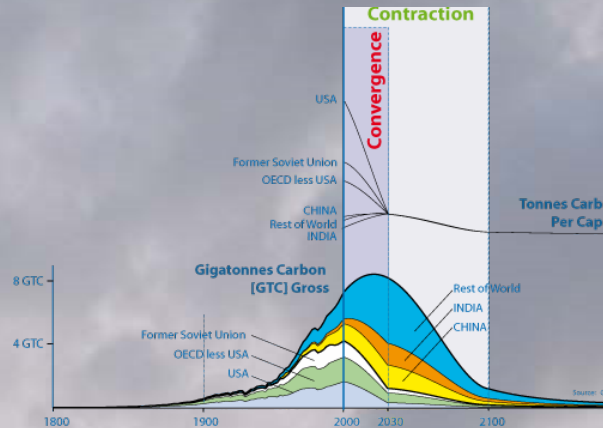
**UNEP Decoupling Natural Resource Use & Environmental Impacts from Economic Growth. 2011 Dr. Ernst Ulrich von Weizsäcker, Dr. Ashok Khosla, Co-Chairs, International Resource Panel (IRP)**

[http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling\\_Report\\_English.pdf](http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling_Report_English.pdf)

## Karl Henrik Robert [2000] Founder of The NATURAL STEP now working en groupe with the EU-Funded CONVERGE Project



The concept of '**Contraction and Convergence**' [C&C] and the CONVERGE project originated with Aubrey Meyer & The Global Commons Institute (GCI). C&C is a global climate policy framework proposed to the UN since 1990 by GCI as a way to manage and reduce anthropogenic carbon dioxide through a burden sharing approach.



This example shows regionally negotiated rates of C&C. It is for a 450ppmv Contraction Budget, with Convergence by 2030.

That the C&C concept has gained substantial traction and recognition since the foundation of the Global Commons Institute in 1990 in the national and international policymaking and decision-making arena can be recognised in the following quotation from the executive secretary of the United Nations Framework Convention on Climate Change;

'Achieving the goal of the climate treaty [to stabilize Greenhouse gas emissions] inevitably requires Contraction & Convergence' (Waller Hunter, UNFCCC Executive Secretary, in CCP).

C&C has been credited with influencing both the Kyoto Protocol and its successor. The principle of C&C has been formally recognised in European Parliament resolutions (European Parliament 1998) and is supported by numerous policy makers, academics, NGOs and lay people.

One of the advantages of C&C is the recognition that any effective and sustainable response to slowing the rise in carbon dioxide levels in the atmosphere inevitably requires addressing the issue of equity - who should reduce carbon emissions and by how much? C&C effectively slices the Gordian knot of allocating responsibility for cutting carbon dioxide emissions by proposing a global per capita allocation solution (a so-called 'strong equity' approach) which also takes account of the issue of the 'historical responsibility' of industrialised nations through its proposal for negotiated rate of convergence. Many scientists and policy makers have come to consider this approach to be not only the most equitable but also the most pragmatic approach to managing climate change when compared to other carbon reduction regimes.

The potentially severe impacts of climate change (IPCC 2007) and the resounding lack of success of alternative approaches to decreasing carbon emissions continue to make the C&C approach attractive.

The CONVERGE project focus on equity and equality based approaches to managing resources derives partly from the C&C carbon reduction framework as described above. Our most important objective is to link the scientifically-validated need to reduce (i.e. to contract) resource use with a justice-based approach to apportioning the responsibility for doing so (to converge).

**Case Studies Illustrating Contraction and Convergence  
Equity & Limits in Theory & Practice - The CONVERGE Project**

[http://intezet.greendependent.org/documents/CONVERGE\\_ebook\\_EquityWithinLimits\\_initiatives\\_web.pdf](http://intezet.greendependent.org/documents/CONVERGE_ebook_EquityWithinLimits_initiatives_web.pdf)



## IPCC and C&C over the years

### Sir John Houghton - Former Chairman IPCC WG1



Sir John Houghton  
Former Chairman IPCC WG1

*"Since the formulation of '**Contraction and Convergence**' [C&C], Aubrey Meyer has tirelessly and selflessly argued for and promoted it with great energy and tenacity in scientific, economic and political fora. Admiration is frequently expressed regarding its elegance and simple logic and it has been widely accepted by policy makers and by NGOs as a basis that should underlie the next stage of policy formulation.*

*There is no other proposal in play that meets so many of the required principles and criteria or that has any real chance of succeeding. It is bound to be strongly influential in the crucial round of international negotiations in the UNFCCC that is about to begin.*

*The personal dedication of Aubrey Meyer, born of a deep concern for global humanity and its future, is what has brought the '**Contraction and Convergence**' proposal to the influential position it holds today." I am most pleased to strongly support his nomination. I cannot think of a more appropriate recipient.*

**Sir John Houghton - Former Chairman IPCC WG1**

### Raul Estrada Oyuela - Chairman Kyoto Protocol Negotiations



Raul Estrada Oyuela  
Chairman of the Kyoto Protocol Negotiations

*"Long before the end of the Framework Convention negotiation, the Global Commons Institute (GCI) has presented a proposal on '**Contraction and Convergence**' aimed to reach equality in emissions per capita. We all in this room know the GCI model where contraction is achieved after all governments, for precautionary reasons, collectively agree to be bound by a target of global GHG emissions, making it possible to calculate the diminishing amount of greenhouse gases that the world can release each year in the coming century, subject to annual scientific and political review.*

*I read that IPCC's WG I Chairman Sir John Houghton said this is the "logical approach. Analysis of '**Contraction and Convergence**' in IPCC TAR is a must if equity is to be taken into account in the report."*

**Raul Estrada Oyuela - Chairman Kyoto Protocol Negotiations  
Intergovernmental Panel on Climate Change [IPCC]**

**Contraction and Convergence [C&C]** [www.gci.org.uk](http://www.gci.org.uk)

### Rajendra Pachauri - Current Chairman IPCC



Professor Rajendra Pachauri  
Current IPCC Chairman

*"If we are to limit global temperature rise to no more than 2-2.4 degrees C global emissions must peak no later than 2015 and start declining thereafter. The faster the decline the greater the possibility of our avoiding some of the worst impacts of climate change.*

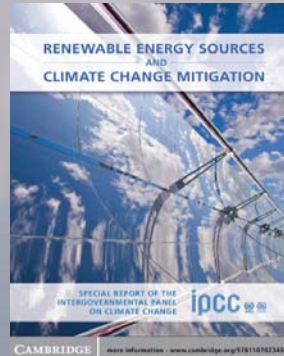
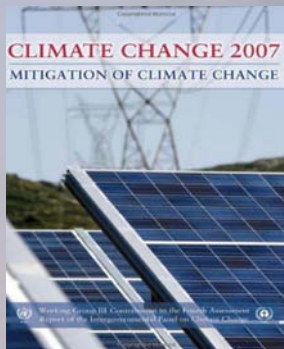
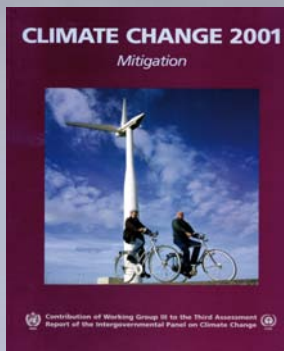
*So when one looks at the kinds of reductions that would be required globally, the only means for doing so is to ensure that there's '**Contraction & Convergence**'. I think there's growing acceptance of this reality. I don't see how else we might be able to fit within the overall budget for emissions for the world as a whole by 2050.*

*We need to start putting this principle into practice as early as possible so that by the time that we reach 2050 we're well on a track for every country in the world that would get us there and we're not caught by surprise.*

*On the matter of 'historic responsibility', there is no doubt that accelerating the rate of convergence relative to the rate of contraction is a way of answering that and we really need to get agreement from Developed and Developing Countries to subscribe to this principle."*

**Rajendra Pachauri - IPCC Chairman**

**Global Humanitarian Forum Geneva June 2009**



"Rights-based, that is based on equal (or otherwise defensible) rights to the global commons. A formulation that carries this insight to its logical conclusion is that of '**Contraction & Convergence**' (Meyer, 1999), whereby net aggregate emissions decline to zero, & per capita emissions of Annex I & non-Annex I countries reach precise equality."

**IPCC Third Assessment [2000] - Working Group 3 Chapter 1**  
[http://www.grida.no/publications/other/ipcc\\_tar/](http://www.grida.no/publications/other/ipcc_tar/)

"A number of scenario studies have been conducted for various countries within Europe. These studies explore a wide range of emission caps, taking into account local circumstances and potentials for technology implementation. Many of these studies have used specific burden-sharing allocation schemes, such as the '**Contraction and Convergence**' (C&C) approach (GCI, 2005) for calculating the allocation of worldwide emissions to estimate national emissions ceilings."

**IPCC Fourth Assessment [2007] - Working Group 3 Chapter 3**  
[http://www.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/contents.html](http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html)

### RENEWABLE ENERGY & CLIMATE MITIGATION [IPCC]

[http://www.gci.org.uk/Documents/SRREN\\_Full\\_Report\\_.pdf](http://www.gci.org.uk/Documents/SRREN_Full_Report_.pdf)

This is the valuable and recently published IPCC Report Renewable Energy Resources & Climate Change Mitigation, is based on this: -

### RECIPE Report - the Economics of De-carbonization

[http://www.gci.org.uk/Documents/RECIPE\\_synthesis\\_report.pdf](http://www.gci.org.uk/Documents/RECIPE_synthesis_report.pdf)

Based on C&C, this RECIPE Report [2009] says: -

"C&C is the default policy scenario for the 450 and 410 scenarios."

1) '**Contraction & Convergence**' (C&C).

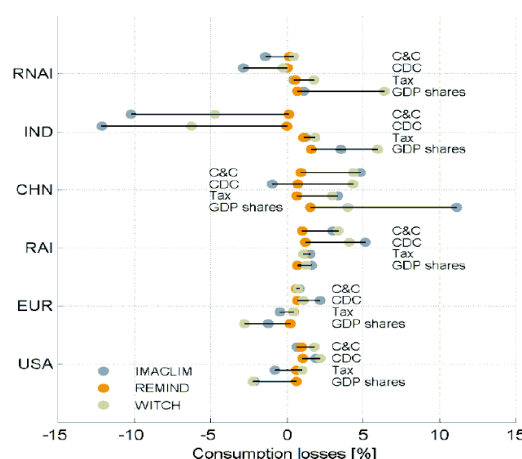
The C&C scheme (Meyer, 2004) envisages a smooth transition of emission shares from status quo (emissions in 2005) to equal per capita emissions in 2050.

It combines elements of grandfathering – allocation based on historic emissions – and equal per capita emissions.

It can thus be considered a compromise between a pure egalitarian regime and a grandfathering approach.

This is the scheme that was used in the default policy scenario and the 450 ppm scenario discussed above.

Meyer, A. ( 2004 ): Briefing: '**Contraction & Convergence**' Engineering Sustainability (157). Issue 4, p. 189-192.



**Figure SPM.10.** Policy costs for key regions and different allocation principles (C&C=Contraction and Convergence, CDC=Common but differentiated Convergence, Tax=Uniform Carbon Tax, GDP Shares= equal emission right of emission per unit of GDP) from the RECIPE project for a 450 ppm CO<sub>2</sub> stabilization target. [Figure 6.30]





## IPCC Fifth Assessment - Working Group One

### Summary for Policy Makers

[http://www.climatechange2013.org/images/uploads/WGIAR5-SPM\\_Approved27Sep2013.pdf](http://www.climatechange2013.org/images/uploads/WGIAR5-SPM_Approved27Sep2013.pdf)

*"Limiting the warming caused by anthropogenic CO<sub>2</sub> emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO<sub>2</sub> emissions from all anthropogenic sources to stay between 0 and about 1560 Giga-tonnes Carbon [Gt C] 0 and about 1210 Gt C, and 0 and about 1000 Gt C since that period respectively.*

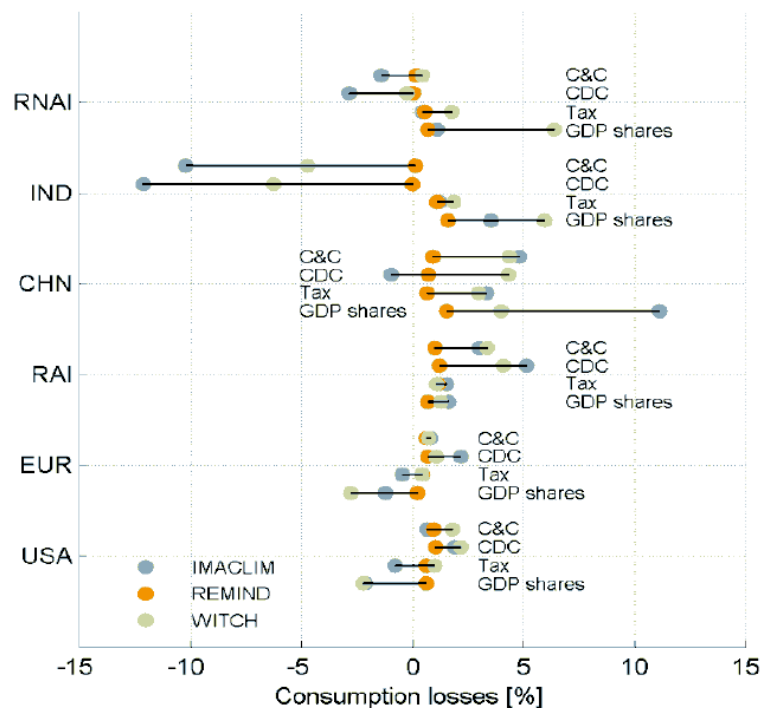
*These upper amounts are reduced to about 880 Gt C, 840 Gt C, and 800 Gt C respectively, when accounting for non-CO<sub>2</sub> forcings as in RCP 2.6. An amount of 531 [446 to 616] Gt C, was already emitted by 2011."*

**All these results analysed using CBAT - see last page & here: -**

[http://www.gci.org.uk/CBAT1\\_j-5a.html](http://www.gci.org.uk/CBAT1_j-5a.html)

## IPCC Fifth Assessment - Working Group Three

### Draft Policy Makers Summary, to be considered April 2014



**Figure SPM.10.** Policy costs for key regions and different allocation principles (C&C=Contraction and Convergence, CDC=Common but differentiated Convergence, Tax=Uniform Carbon Tax, GDP Shares= equal emission right of emission per unit of GDP) from the RECIPE project for a 450 ppm CO<sub>2</sub> stabilization target. [Figure 6.30]



**Based on RECIPE which is based on C&C [see above].**

[http://www.gci.org.uk/Documents/WGIII\\_AR5\\_Draft2\\_SPM.pdf](http://www.gci.org.uk/Documents/WGIII_AR5_Draft2_SPM.pdf)

Project team - Coordinating lead authors

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## Joke Waller Hunter - UNFCCC Executive Secretary



Joke Waller Hunter  
UNFCCC Executive Secretary 2002 - 2005

*"Achieving the goal of the United Nations Framework Convention on Climate Change inevitably requires '**Contraction and Convergence**'. "*

**The late Joke Waller Hunter -  
UNFCCC Executive Secretary 2002 - 2005; COP-9 in Milan 2003**

## Professor Ross Garnaut - Author Garnaut Climate Review



Professor Ross Garnaut  
Author Australian Government Climate Change Review

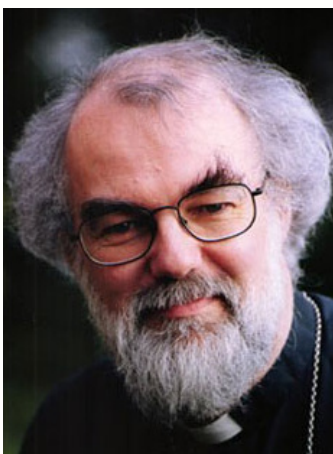
*"Over the last 20 years, Aubrey Meyer's sustained work through the Global Commons Institute with the '**Contraction and Convergence**' or C&C concept and campaign, has created a global standard that is now widely recognized is an outstanding and essential contribution to the global debate on what to do avoid dangerous rates of climate change.*

*This is remarkable and reflects the integrity of the argument where C&C is mathematically rooted in the science of climate change and marries the limit to future human emissions that avoids dangerous rates of climate change to the politically compelling requirement of equal shares in the use of the atmosphere subject to that limit.*

*It embodies the economic political reality, that adjustment to equal per capita emissions entitlements will take time. It is a rational, flexible and transparent concept that holds out the best hope of all urgent proposals that might form a basis of an environmentally and economically rational global agreement on climate change mitigation.*

*The '**Contraction and Convergence**' idea was at the core of the proposals for international agreement that are part of the Garnaut Climate Change Review, commissioned by and presented to the Australian Prime Minister and all State Premiers."*

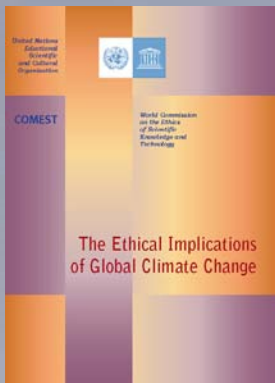
## Rowan Williams - Former Archbishop of Canterbury



Rowan Williams  
Former Archbishop of Canterbury

*"The Global Commons Institute, based in London, has in recent years been advancing a very sophisticated model for pushing us back towards some serious engagement with this matter of equality, through its proposed programme of '**Contraction and Convergence**'. This seeks to achieve fairly rapid and substantial reductions in greenhouse gas emissions - but to do so in a way that foregrounds questions of equity between rich and poor nations. At the moment, rates of emission are fantastically uneven across the globe. In the first 48 hours of 2004, an average American family would have been responsible for as much in the way of emissions as an average Tanzanian family over the entire year. So what is proposed is that each nation is treated as having the same limited 'entitlement to pollute' - an agreed level of carbon emission, compatible with goals for reducing and stabilizing overall atmospheric pollution. Those who think '**Contraction and Convergence**' is Utopian, simply haven't looked honestly at the alternatives."*

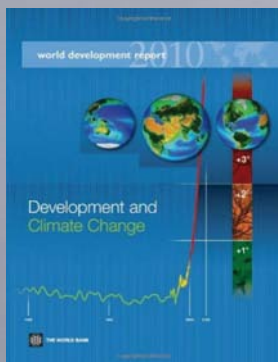




"The principle of **"Contraction & Convergence"** refers to the emission of gases contributing to the greenhouse effect. A fair and pragmatic approach, it is argued, would be to move gradually towards quotas that would not be indexed on GDP, as is the case in the Kyoto Protocol, but rather on population, while gradually reducing the permitted total towards the 60% reduction commended by the Intergovernmental Panel on Climate Change (IPCC). Such a principle may be seen as a consequence of both the principles of environmental justice and the principles of earth as global commons. The particular problem whether future emissions allocations should be based on a per capita basis, as the so-called "contraction and convergence" proposal suggests, or on a country basis, might be seen in a different light if humanitarian aid were internationally organized on a basis of each country's ability to pay. The greater duty of rich countries to contribute to such aid might be politically easier to accept than more stringent emission limits imposed on "more polluting" and "past polluting" countries than LDCs (least developed countries), which would also cost "richer" countries more."

**"Contraction & Convergence"** (C&C) is the science-based, global climate policy framework proposed to the United Nations since 1990 by the Global Commons Institute (GCI). <http://www.gci.org.uk/briefings/ICE.pdf>

**UNESCO - The Ethical Implications of Climate Change: A Report by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST)** [http://www.gci.org.uk/Documents/UNESCO\\_COMEST\\_.pdf](http://www.gci.org.uk/Documents/UNESCO_COMEST_.pdf)



The **'Contraction and Convergence'** approach assigns every human being an equal entitlement to greenhouse gas emissions. All countries would thus move toward the same per capita emissions. Total emissions would contract over time, and per capita emissions would converge on a single figure. The actual convergence value, the path toward convergence, and the time when it is to be reached would all be negotiable. **"Contraction & Convergence"** (C&C) is the science-based, global climate policy framework proposed to the United Nations since 1990 by the Global Commons Institute (GCI).

<http://www.gci.org.uk/briefings/ICE.pdf>

**WORLD BANK Development Report 2010**

<http://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1226014527953/WDR10-Full-Text.pdf>



Having reviewed the trends in the use of natural resources and accompanying undesirable environmental impacts in the first section of Chapter 2, the last section of that chapter considers possible future implications by presenting three brief scenarios: (1) business as usual (leading to a tripling of global annual resource extraction by 2050); (2) moderate **'Contraction and Convergence'** (requiring industrialized countries to reduce their per capita resource consumption by half the rate for the year 2000); and (3) tough **'Contraction and Convergence'** (aimed at keeping global resource extraction at its current levels). None of these scenarios will lead to actual global reductions in resource use, but all indicate that substantial reductions in the resource requirements of economic activities will be necessary if the growing world population can expect to live under conditions of sustainable resource management. The key message of the tough scenario is that despite population growth to roughly 9 billion people, the pressure on the environment would remain roughly the same as it is now. The emissions correspond approximately to the lowest range of scenario B1 of the IPCC SRES, but are still 20% above the roughly 5.5 GtC/yr advocated by the Global Commons Institute for contraction and convergence in emissions (GCI, 2003).

**UNEP - Decoupling Natural Resource Use and Environmental Impacts from Economic Growth**  
**Dr. Ernst Ulrich von Weizsäcker, Dr. Ashok Khosla,**  
**Co-Chairs, International Resource Panel (IRP)**  
[http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling\\_Report\\_English.pdf](http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling_Report_English.pdf)



*"The few studies that are now beginning to assess the health consequences of decisions aiming to mitigate or adapt to climate change use very different analytical methods and assumptions, even for very similar challenges. There is a need to develop more generic guidance on conceptual frameworks and methods in order to improve comparability, and assist decision-makers to achieve the greatest health "co-benefits", and avoid harm.*

*This should cover the full range of potential decisions, from the "macro" level for example global '**Contraction & Convergence**' in carbon dioxide emissions; carbon pricing policy and incentives), to more local and sector specific decisions (city-level policies to promote public transport, or protect a natural watershed)."*

**Protecting Health from Climate Change**  
**Global research priorities**  
**WORLD HEALTH ORGANIZATION 2009**  
[http://whqlibdoc.who.int/publications/2009/9789241598187\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241598187_eng.pdf)

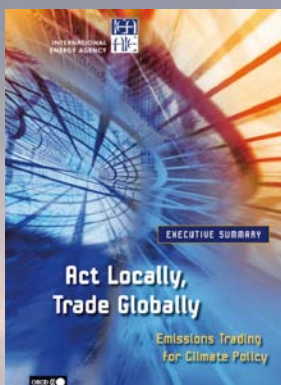


**'Contraction and convergence' - sustainability with equity.**  
**UNDP - Human Development Report 2008**

*Our pathway is rooted in a commitment to achieve a practical goal: namely, the avoidance of dangerous climate change. The route taken requires a process of overall contraction in greenhouse gas flows and convergence in per capita emissions.*

*'Contraction and Convergence' (C&C) is the science-based, global climate policy framework proposed to the United Nations since 1990 by the Global Commons Institute (GCI). <http://www.gci.org.uk/briefings/ICE.pdf>*

The term '**Contraction and Convergence**' is a registered to the Global Commons Institute (GCI); <http://www.gci.org.uk/>



*"Some proposals compensate the potential burden on developing nations with generous emissions allocation, whether as a simple strategy to obtain developing countries support for the regime or in a realisation of the global equity principle borrowed from social justice.*

*A famous such proposal is '**Contraction and Convergence**' developed by Aubrey Meyer.*

**Act Locally Trade Globally; Emissions Trading for Climate Policy**  
**Organisation for Economic Cooperation and Development IEA**  
[http://books.google.com/books?id=Mpba74EPLZAC&pg=PA174&dq=contraction+and+convergence&hl=en&ei=KQfcTd3rDIyq8APUhoUD&sa=X&oi=book\\_result&ct=result&resnum=3&ved=0CDIQ6AEwAji-AQ#v=onepage&q=contraction%20and%20convergence&f=false](http://books.google.com/books?id=Mpba74EPLZAC&pg=PA174&dq=contraction+and+convergence&hl=en&ei=KQfcTd3rDIyq8APUhoUD&sa=X&oi=book_result&ct=result&resnum=3&ved=0CDIQ6AEwAji-AQ#v=onepage&q=contraction%20and%20convergence&f=false)



*"The scenarios all assume a burden sharing regime based on "Contraction and Convergence": global emissions contract over time according to the global pathway, and regional emission allowances (i.e. regional permit allocation) as a share of the global budget converge from shares in current emission levels to equal per-capita emissions by 2050 (see also simulation 2 below). Note that in the 450 Delayed Action scenario the burden sharing regime only applies after 2020."*

*"Contraction and Convergence" (C&C) is the science-based, global climate policy framework proposed to the UN since 1990 by the Global Commons Institute (GCI): - <http://www.gci.org.uk/briefings/ICE.pdf>*  
**OECD Environmental Outlook to 2050**

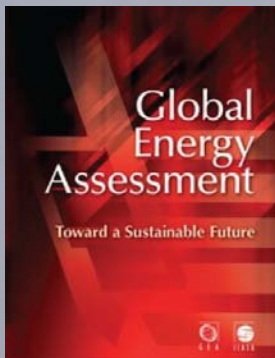




*GLOBE International adopted the “**Contraction and Convergence**” analysis in May 1977. Since then, I and my colleagues have campaigned for its acceptance. This pamphlet is a record of those efforts and provides a short summary of the work of the Global Commons Institute (GCI) in this field.*

*I pay tribute to all the GLOBE parliamentarians who have fought so hard for this cause and particularly to the work of Aubrey Meyer & the GCI team on whose brilliant analysis the campaign is based.*

**Tom Spencer Former Director GLOBE International  
Chair European Parliament Foreign Affairs Committee**



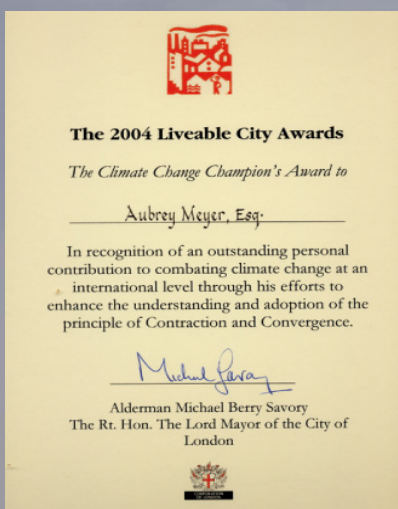
### **Transfers under Contraction & Convergence Assumptions IIASA**

*This section explores the implications of an illustrative burden-sharing scheme for the allocation of future emissions rights and applies it to the GEA pathways. This burden-sharing scheme has been introduced in the literature as ‘**Contraction and Convergence**’ by the Global Commons Institute and was subsequently used in many scientific analysis (see, e.g., den Elzen and van Vuuren, 2007).*

*In essence, under such a scheme, all regions need to converge to a common per capita emissions entitlement by a specified date (2050). For regions with per capita emissions above the world average, this implies reductions (hence the term “contraction”) until the convergence criterion is fulfilled, but starting from very different initial conditions. For regions with per capita emissions below the world average, emissions can rise initially until they reach the world average.*

*Thereafter, these regions also need to contract to the specified convergence level. The resulting emissions projections from the allocation scheme differ from the original GEA pathways, which assume that reductions take place where they are most cost-effective.*

**Global Energy Assessment - Towards a Sustainable Future  
Nebojsa Nakicenovic et al IIASA**

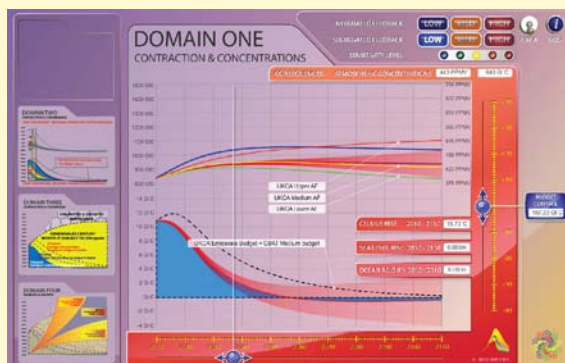


### **In 2005 the City of London made Aubrey Meyer a Life-Time's Achievement Award**

*"From the worlds of business, academia, politics and activism, Aubrey Meyer has made the greatest contribution to the understanding and combating of climate change having led strategic debate or policy formation. In recognition of an outstanding personal contribution to combating climate change at an international level through his efforts to enhance the understanding and adoption of the principle of **Contraction and Convergence**."*

This 'CBAT' is a user-interactive screen-based 'heuristic device': - <http://www.gci.org.uk/CBAT/cbat-domains/Domains.swf>  
A mock-up of the full '4 Domain' Carbon Budget Analysis Tool is here: - <http://www.gci.org.uk/infoD2a.html>

**CBAT DOMAIN ONE; Contraction and Concentrations:** - Segregated-Feedback, Medium-Climate-Sensitivity, Slider at '0', UKCA Switch 'on'.



The screenshot displays the 'Domain Two' interface, which is used for modeling regional shares and emissions. The main title is 'DOMAIN TWO' with the subtitle 'CONTRACTION & CONVERGENCE'. The interface includes several panels and controls:

- Top Panel:** Contains buttons for 'CONTRACTING', 'RELAXED FIDUCIAL', and 'SENSITIVE TRIGGERS'. There are also buttons for 'LOW', 'MEDIUM', and 'HIGH' scenarios, and a 'RESET' button.
- Left Panel:** Includes a 'CONTRACTING' graph showing a blue curve, an 'EMISSION TARGET' graph showing a blue curve, and an 'EMISSION TARGET' graph showing a blue curve.
- Main Graph:** Titled 'REGIONAL SHARES PER CAPITA EMISSIONS', it shows a line graph with multiple colored lines representing different regions. A dashed box highlights the 'UK Climate Act (1.5°C Medium Budget: "Two Week" scenario)'.
- Right Panel:** Includes a 'REGIONAL EMISSIONS' graph showing a blue curve, a 'REGIONAL EMISSIONS' graph showing a blue curve, and a 'REGIONAL EMISSIONS' graph showing a blue curve.
- Bottom Panel:** Titled 'CBAT LOW BUDGET - REGIONAL SHARES GROSS EMISSIONS', it shows a line graph with multiple colored lines representing different regions.

The screenshot displays the 'Domain Three' interface, which is a simulation tool for climate change scenarios. The central focus is a graph titled 'UNLIMITED £ GROWTH IMPOSSIBLE' and 'RENEWABLES CENTURY WORTH IT SUBJECT TO 350 ppmv'. The graph plots CO2 concentration (ppmv) on the y-axis (0 to 1400) against time (years) on the x-axis (0 to 2100). A solid blue line represents the 350 ppmv threshold, and a dashed yellow line represents the 550 ppmv threshold. The area between the 350 ppmv line and the 550 ppmv line is shaded yellow, indicating a region of 'Damages Uncontrollable Runaway & Collapse Inevitable'. The area below the 350 ppmv line is shaded blue, indicating a region of 'Damages Controllable Runaway & Collapse Probable'. The interface includes a top navigation bar with 'DOMAIN THREE' and 'CONTRACTION & REVERSAL' buttons. On the left, there are three small graphs labeled 'CONTRACTING', 'DOMINATING', and 'REVERSING'. On the right, there are two small graphs labeled 'REVERSING' and 'DOMINATING'. The interface also includes a 'SLIDE' button and a 'REVERSE' button.

[illegible]



## **SOME RESPONSES TO CBAT so far:** - [http://www.gci.org.uk/Responses\\_to\\_CBAT.html](http://www.gci.org.uk/Responses_to_CBAT.html)

**Ernst von Weizsacker - Chairman of the Club of Rome:** - *"Fine tool for gruesome reality-forecast."*

**David Wasdell- Chairman of the Apollo Gaia Group:** - *"We recognise that GCI has made a unique breakthrough in creating a user-interactive, non-directive dashboard with potential to simulate such an inclusive range of the system dynamics of the natural/human interaction! Separating the contribution to CO<sub>2</sub> concentrations driven by anthropogenic emissions from the contribution coming from the feedback system is brilliant at a conceptual level."*

**Professor Helmut Burkhardt - Science for Peace & Ryerson University Toronto, Canada.**  
*"CBAT is an excellent tool to visualize effects of human and natural actions."*

**Julian Salt - Insurance Consultant:** - *"For negotiators to make the next steps more effective, they have to not only grapple with the rising tide of man-made emissions, but also the far more important issue of feedback emissions (natural and induced). This CBAT model created by Aubrey Meyer encapsulates this issue in his usual style of beautiful imagery that at a glance will show any negotiator the seriousness of the problem at hand. CBAT will, at a stroke, negate all present emissions targets as futile and force them to reconsider the whole issue from a global perspective. As past efforts have shown, if this approach is not taken another 10-20 years will be wasted in more UNFCCC meetings. I commend this model to any agency that cares to listen and act on his findings."*

**Henry Nicholls Author of the Way of the Panda** *"This is a great tool, one that shows clearly that the decisions we make now will have profound consequences."*

**Bill McGuire - Professor of Geophysical & Climate Hazards, University College London [UCL] Director UCL's Aon Benfield UCL Hazard Centre [1997 2010]:** - *"The failure of IPCC AR5 and the UKMO's UK Climate Act to address the critical issue of carbon feedbacks, particularly in relation to methane release as a consequence of permafrost thawing, is both disappointing and dangerous. By effectively setting the likely consequences of such feedback effects at zero, future temperature projections are minimised, so pandering to those who wish to play down the level of warming we can expect and reducing the perceived impact of climate change down the line. By separating out the effects of human-induced and feedback-related emissions, the GCI's brilliant CBAT visualisation tool sidesteps the wishful thinking and provides a sharp dose of reality. I urge all who wish to view a true picture of how climate change will transform our world as the century progresses to use it and promote it."*

**Professor Michael Mainelli - Gresham College, Long Finance & London Accord:** - *"This truly is a most wonderful device. Chiara and I will promote it via Long Finance's London Accord."*

**Donald A. Brown - Scholar In Residence, Sustainability Ethics and Law, Widener University School of Law, Pennsylvania, USA:** - *"The new CBAT model will be of great value both to international climate negotiators, governments and NGOs engaged in international climate negotiations. It allows those interested in developing a global solution to visualize the otherwise complex interactions of international carbon budgets, atmospheric greenhouse gas concentrations, and emissions reductions commitments. Although I am personally familiar with the relationships between the variables represented in the CBAT, I found having the ability to change inputs to the model through the use of the CBAT made me understand at a deeper level the policy choices facing the international community. The CBAT model should be very useful for all who hope to understand future climate change policy options and the scale of the global challenge facing the world. I have been engaged in climate change policy options since the 1992 Earth Summit at which the United Nations Framework Convention was opened for signature and have attended most of the Conference of Parties under the UNFCCC since then. Yet even though I have significant experience and knowledge about future climate change policy challenges, the CBAT model helped me visualize the significance of certain policy options facing the world. I also fully support efforts to make contraction and convergence (C&C) the central framework for allocating national greenhouse gas emissions in the years ahead. C&C is also flexible enough to deal with several equity issues raised by others."*

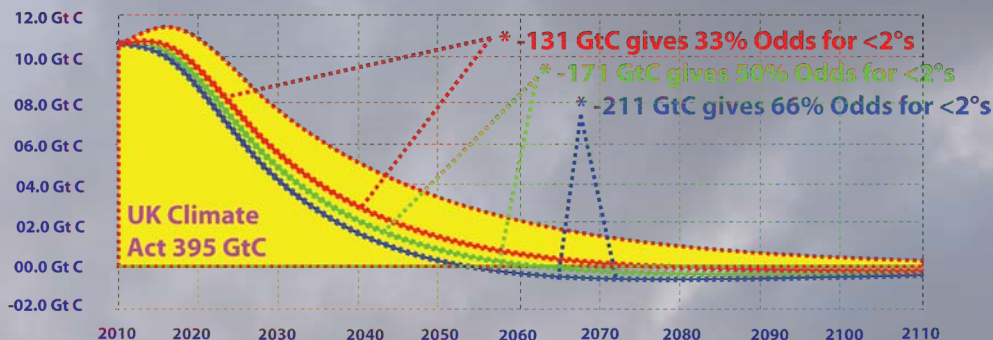
**Walter Vergara- Chief, Climate Change and Sustainability Division (INE/CCS) Inter-American Development Bank:** - *"Good initiative."*

**Dave Hampton - The Carbon Coach:** - *"First impressions are immensely positive. It's fresh, clear and good looking and conjures up memories of those exhibits I used to love at the science museum as a child where you could twiddle a couple of knobs and influence what you saw. I like the clinical delivery of the three vital stats - the (devastatingly all important) numbers - without any panic fuss or judgement: sea level, ocean acidity, and of course mean temp rise. I guess C-BAT is mainly for relative experts but I like the way it integrates everything. You can imagine a Facilities Manager using a tool like this to optimise the long term comfort conditions for their occupants over time."*

**Prof Paul G. Harris - Chair of Global & Environmental Studies Hong Kong Inst. of Education:** - *"GCI's new Carbon Budget Analysis Tool is an innovative way to help citizens, government officials and non-governmental actors get their heads around the growing impacts of our lifestyle choices for the future. The tool illustrates how changes in how we live - whether we pollute the atmosphere more in the future or finally overcome our addictions to pollute less - can have marked consequences in future decades. A vital message that comes from the tool is that acting now will be far easier than acting later - and that doing nothing will be catastrophic indeed."*

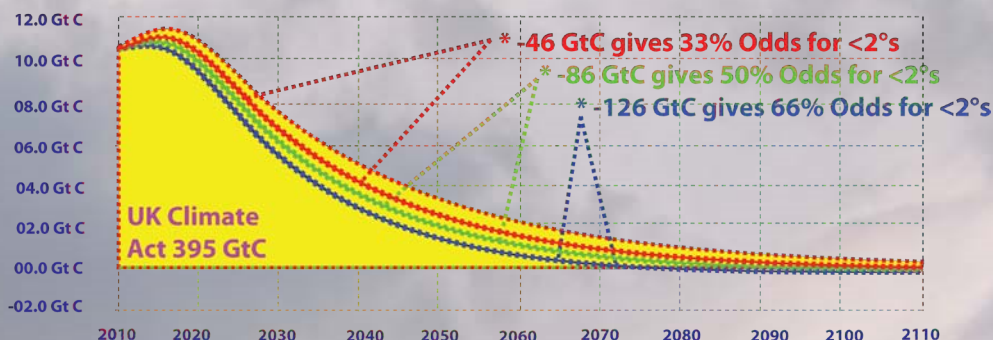
# Using Carbon Budget Analysis Tool [CBAT] to analyse the published results from IPCC AR5 Policy Makers Summary - September 2013.

**If 616 Gt C already emitted, IPCC AR5 shows UK Climate Act: -**



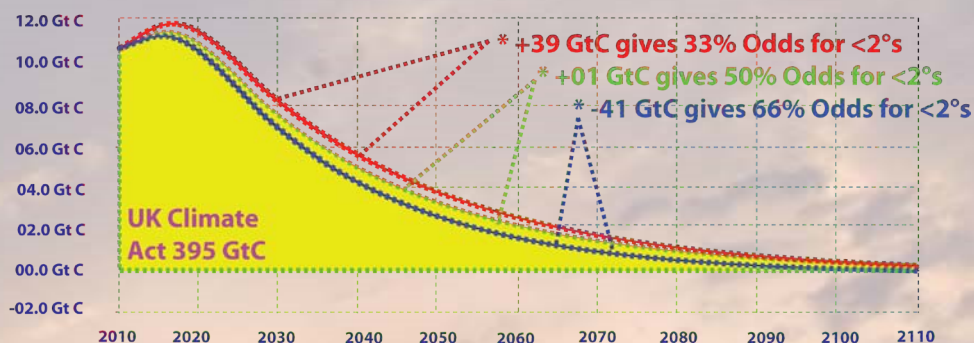
IPCC AR5 Odds for 2° C	Cumulative 1800 to 'Future'	+ Non-CO2 Forcings in RCP 2.6	Emitted Already [Contentious]	Final Residual Balance	UKCA 395 GtC Reduce UKCA by . . .
33%	1,560 Gt C	880 Gt C	616 Gt C	264 Gt C	131 Gt C
50%	1,210 GtC	840 GtC	616 GtC	224 GtC	171 GtC
66%	1,000 GtC	800 GtC	616 GtC	184 GtC	211 GtC

**If 531 Gt C already emitted, IPCC AR5 shows UK Climate Act: -**



IPCC AR5 Odds for 2° C	Cumulative 1800 to 'Future'	+ Non-CO2 Forcings in RCP 2.6	Emitted Already [Contentious]	Final Residual Balance	UKCA 395 GtC Reduce UKCA by . . .
33%	1,560 Gt C	880 Gt C	531 Gt C	349 Gt C	46 Gt C
50%	1,210 GtC	840 GtC	531 GtC	309 GtC	86 GtC
66%	1,000 GtC	800 GtC	531 GtC	269 GtC	126 GtC

**If 446 Gt C already emitted, IPCC AR5 shows UK Climate Act: -**



IPCC AR5 Odds for 2° C	Cumulative 1800 to 'Future'	+ Non-CO2 Forcings in RCP 2.6	Emitted Already [Contentious]	Final Residual Balance	UKCA 395 GtC Reduce UKCA by . . .
33%	1,560 Gt C	880 Gt C	446 Gt C	434 Gt C	-39 Gt C
50%	1,210 GtC	840 GtC	446 GtC	394 GtC	1 GtC
66%	1,000 GtC	800 GtC	446 GtC	354 GtC	41 GtC