

Information Toolkit for post-2012 climate policies

Update 2009

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The Consortium

The consortium exists of two partners: Brinkman Climate Change, Energy research Centre of the Netherlands (ECN):

- Brinkman Climate Change, Sander Brinkman, www.brinkmanclimatechange.com
- ECN, Koen Smekens, www.ecn.nl

Both Brinkman Climate Change (Project Management) and ECN developed the current Toolkit, which may be downloaded from:

<http://www.brinkmanclimatechange.com/Toolkit.htm>

Background

AWG

The Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG) commenced its work during SB24 in May 2006:

“The AWG will focus its discussions on the consideration of further commitments by Parties included in Annex I to the Convention. In addition to presenting new and quantitative information and views on emissions, emission limitation or reduction commitments, Annex I Parties should also assemble and analyse information on a diversity of scientific and socio-economic topics in order to enhance common understanding of the level of ambition of their future commitments.”

WAB

The Netherlands Programme on Scientific Assessment and Policy Analysis Climate Change (WAB) decided, based on the needs of the AWG, to start a project to develop a Toolkit to support Dutch and European negotiators in their post-Kyoto negotiations. Brinkman Climate Change and ECN took on this assignment, which resulted in the “extended version” Toolkit, which can be downloaded from the WAB website:

http://www.mnp.nl/en/themasites/wab/products/Climate_Change_Miscellaneous/Information_Toolkit_for_post_2012_climate_policies.html .

From the beginning of the project, WAB indicated that their support would cover only one year of development (2007). Thereafter, relevant parties should decide whether to further support the development and updating of the Toolkit.

Dutch Ministry of Environment

The Dutch Ministry of Environment (VROM) decided to update the Toolkit once again in 2009 (as in 2008), since it is very important to update the contents every year to keep up with the current state of the art of the negotiations and with the recent scientific findings.

Objective of the Toolkit

The objective is to provide factual underpinning for negotiators to strengthen their position in the negotiations on further commitments. Negotiators want to have facts and figures that can assist in making a presentation and in exchanging information to substantiate the points they may want to make.

Description of the 2009 Toolkit

The Toolkit has been developed in the AIMMS programming language. The AIMMS programming environment allows the development of a graphical user interface (GUI) for a program in a relatively straightforward manner. Since the AIMMS environment works with so called sets, it allows the development of a flexible GUI, in our case a flexible Information Toolkit. In AIMMS it is possible to assign fixed colours or symbols to fixed elements, i.e. a certain country will always have the same colour, no matter when you select it or on which page. This helps in the development of user friendly GUIs. It should be stressed that the developed Information Toolkit is not a mathematical model, but is an interface which allows the quick presentation of the underlying data of this project. The data has been put in a database which is read by the Toolkit upon start-up.

The current contents of the Toolkit are presented in Appendix I. It specifically aims at the actual need for information on actual negotiating issues.

The update 2009 mainly aimed to include :

- Updated UNFCCC datasets
- Updated IEA R&D datasets
- Updated ECN CDM study
- Updated Factors Underpinning Future Action study (Ecofys)
- National targets
- Results from the ADAM project
- Many MACs from several studies
- IMO bunker study
- IEA World Energy Outlook data
- GAINS (MACs and 2020 GHG per sector per country)
- Project Catalyst: Setting a benchmark: How developed countries might equitably contribute towards a 450 ppm pathway (European Climate Foundation)



Figure 1: Opening screen Toolkit

Figure 1 shows the Toolkit's opening screen. From here you can directly enter one of the main categories:

1. Emission pathways and corridor analysis
2. Trends & Projections
3. Mitigation potentials & scenarios
4. Mitigation costs
5. Additional data

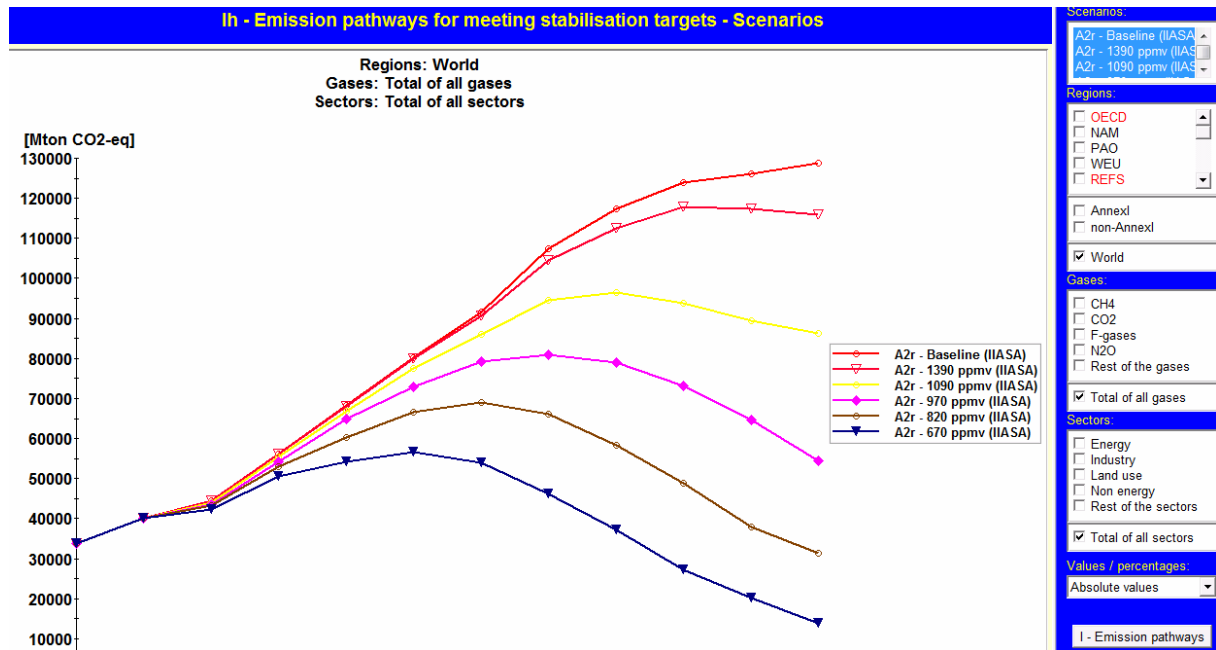


Figure 2: Example of the Toolkit’s flexibility and user friendliness

The users may compose their own figures by choosing specific parameters. Figure 2 shows many possibilities:

- Present the emission pathways by region, gas, sector or scenario (at the bottom, not visible in Figure 2))
- Select specific scenarios (top right)
- Select region(s) (2nd from top right)
- Select gas(es) (3rd from top right)
- Select sector(s) (bottom right)
- Select absolute or relative (to 1990 or 2000) values

The figure’s flexibility of course depends on the amount of detail in provided datasets. The Toolkit also contains e.g. hard figures (directly copied from papers), or less detailed datasets. All used datasets are publicly available.

Relevance

At CoP 13 (Bali) it appeared that a tool such as the Toolkit is an effective tool to check and lookup facts and figures, as well as to present datasets which are supported by all Parties.

At CoP 14 (Poznan) the Toolkit team had a side event where a presentation was given on the Toolkit. The presentation was warmly received. Especially developing countries were very interested, but also specifically these countries had troubles downloading the Toolkit, due to the requirement of administrator rights or software problems. This could be solved by developing a web based version. Funds for developing this webbased version were not found.

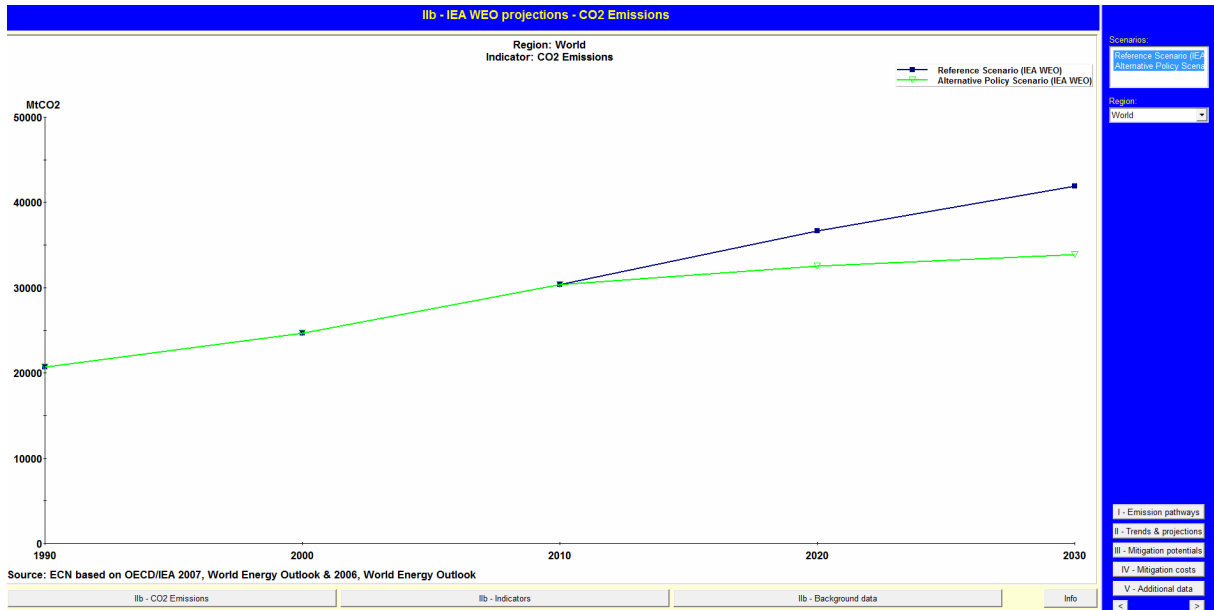
The UN climate change conference in Copenhagen in 2009 is the most important conference since Kyoto in 1997 to determine the world's response to the environmental crisis that faces the planet. Key to the outcome of the conference is the question of robust and reliable data. Therefore, the Toolkit should be updated to keep up with recent policy and scientific developments.

Newly added datasets and figures

Apart from the updated datasets (UNFCCC, ECN CDM, Meinshausen, Factors underpinning future action), many recent studies have been added. Below an overview.

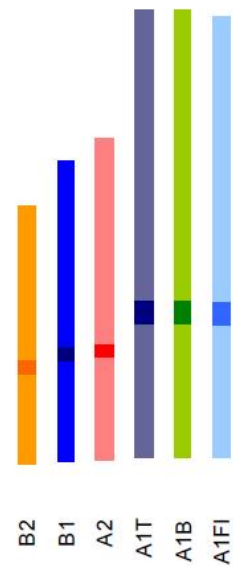
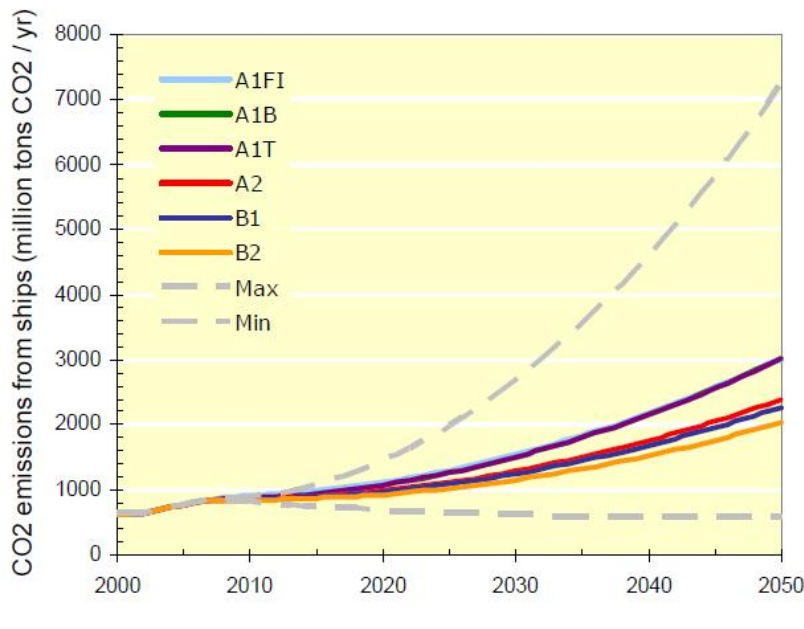
Party	Quantified emission limitation or reduction commitment (percentage of base year or period level)	Base year level of total national emissions as determined by the initial review (tonnes CO ₂ equivalent)
Australia	108.0	547,699,841
Austria	87.0	79,049,657
Belarus*	92.0 ^a	
Belgium	92.5	145,728,763
Bulgaria*	92.0	132,618,658
Canada	94.0	593,998,462
Croatia*	95.0	
Czech Republic*	92.0	194,248,218
Denmark	79.0	69,978,070
Estonia*	92.0	42,622,312
European Community	92.0	4,265,517,719
Finland	100.0	71,003,509
France	100.0	563,925,328
Germany	79.0	1,232,429,543
Greece	125.0	106,987,169
Hungary*	94.0	115,397,149
Iceland	110.0	3,367,972
Ireland	113.0	55,607,836
Italy	93.5	516,850,887
Japan	94.0	1,261,331,418
Latvia*	92.0	25,909,159
Liechtenstein	92.0	229,483
Lithuania*	92.0	49,414,386
Luxembourg	72.0	13,167,499
Monaco	92.0	107,658
Netherlands	94.0	213,034,498
New Zealand	100.0	61,912,947
Norway	101.0	49,619,168
Poland*	94.0	563,442,774
Portugal	127.0	60,147,642
Romania*	92.0	278,225,022
Russian Federation*	100.0	3,323,419,064
Slovakia*	92.0	72,050,764
Slovenia*	92.0	20,354,042
Spain	115.0	289,773,205
Sweden	104.0	72,151,646
Switzerland	92.0	52,790,957
Ukraine*	100.0	920,836,933
United Kingdom of Great Britain and Northern Ireland	87.5	779,904,144

National targets given for several countries, based on the UNFCCC, 2009.

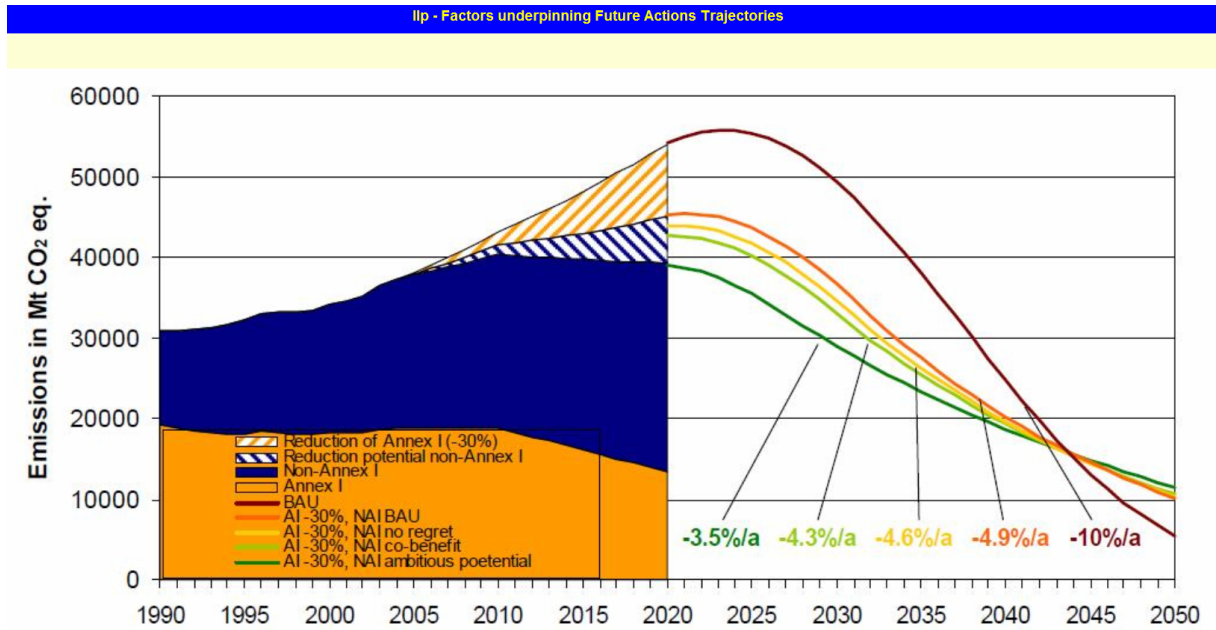


IEA World Energy Outlook. This database enables the users to draw their own figures on CO2 emissions for several regions, based on the IEA WEO projections. Furthermore, it gives TPES/GDP, TPES/Capita, CO2energy/TPES, CO2energy/Capita, CO2energy/GDP, as well as TPES, GDP and population separately.

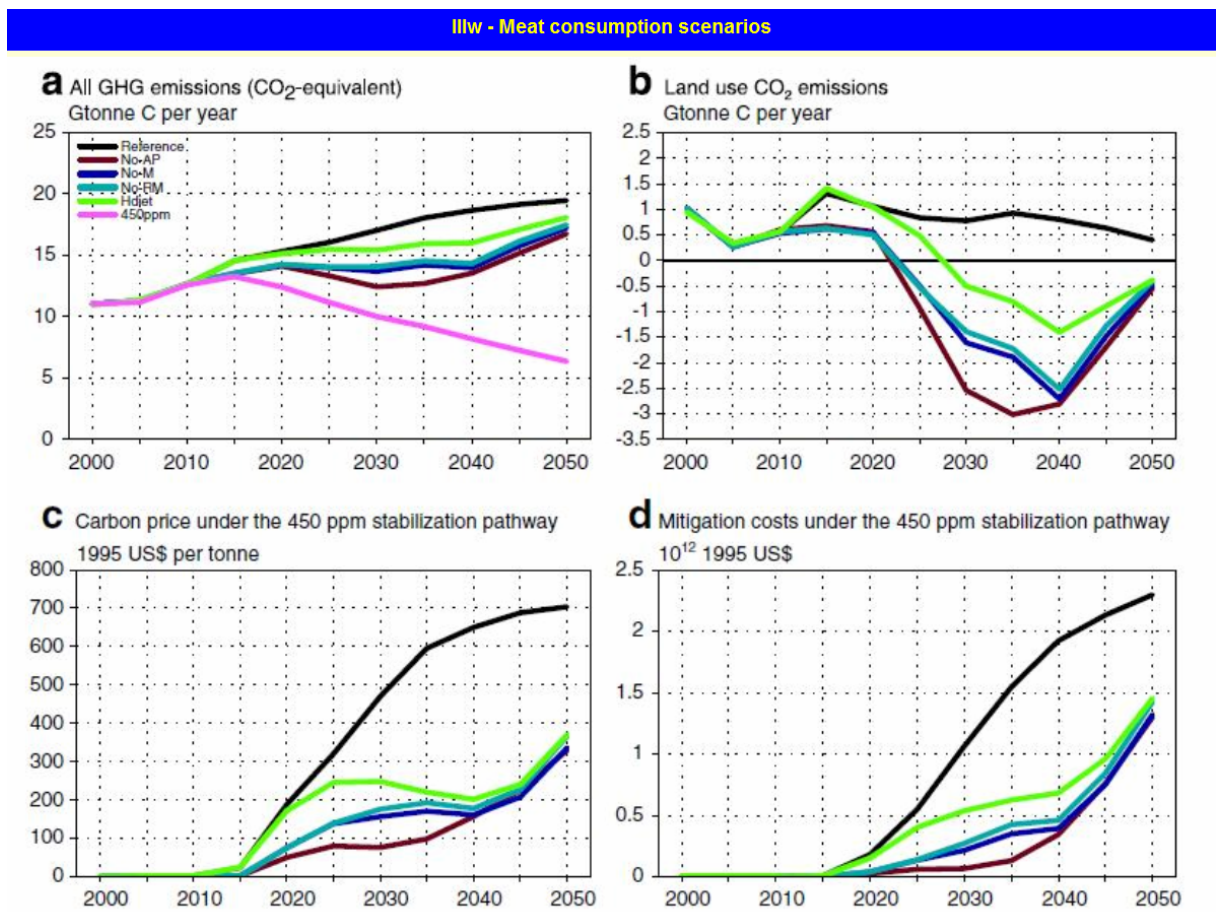
International shipping CO2 emission scenarios



IMO (2009) marine bunker trajectories up to 2050.

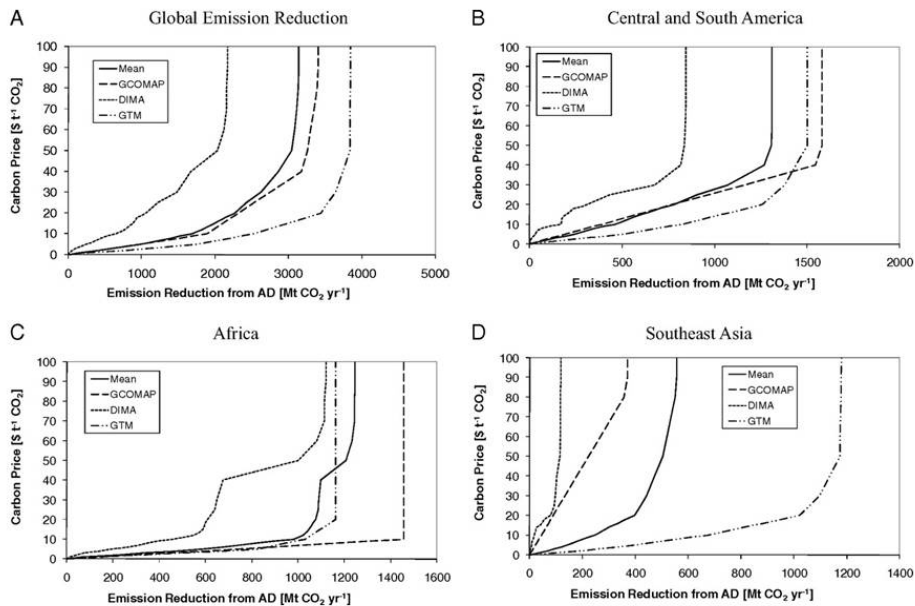


A worldwide overview of trajectories up to 2050, based on the updated Factors Underpinning Future Action study (Höhne et al, 2009). The Toolkit now also includes the updated datasets per country (2009).



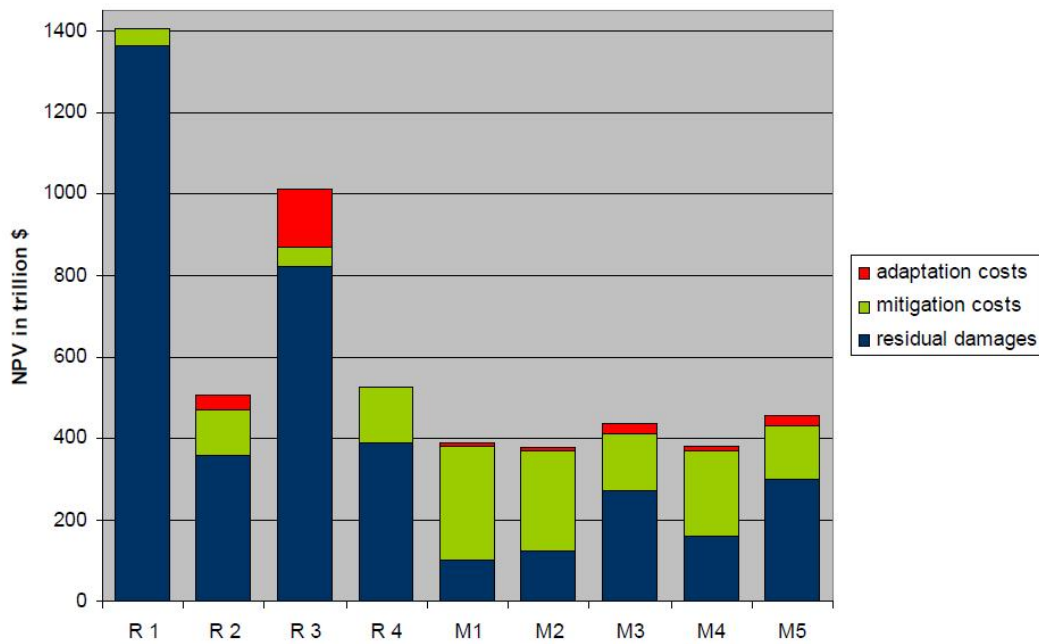
Meat consumption is becoming a more important issue considering climate change. Therefore we included some figures from Stehfest et al (2009).

Marginal costs in 2030 of emissions reductions with AD activities in three regions with predictions of the three models

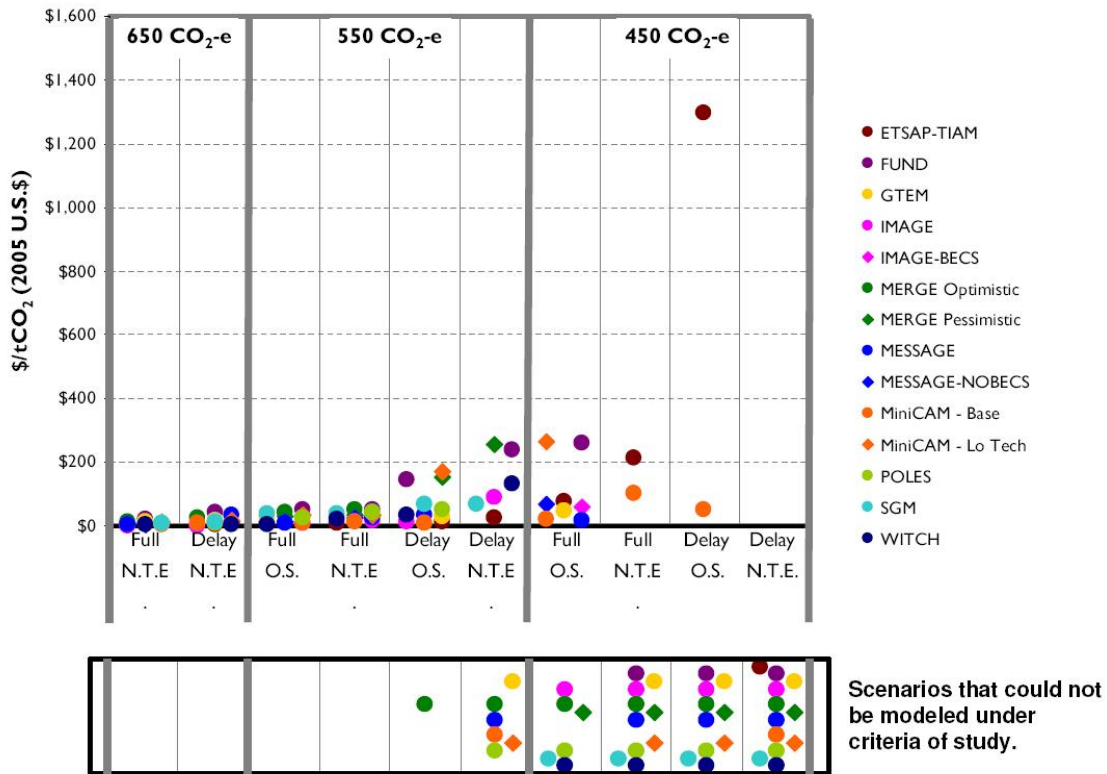


Kindermann G et al. PNAS 2008;105:10302-10307

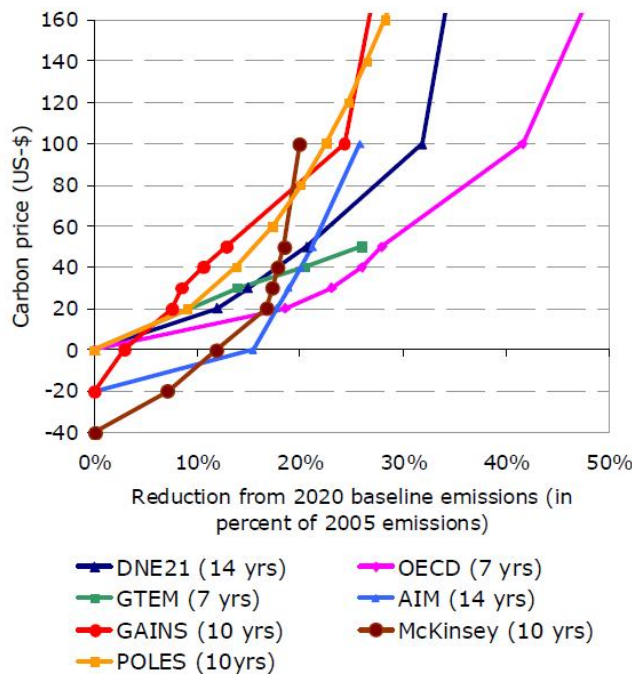
Avoiding deforestation could be a negotiating issue in Copenhagen. Therefore, we included three figures (2010,2020, 2030) on marginal costs of avoiding deforestation measures, based on Kindermann et al (2008).



De Bruin et al (2009) published an OECD study on the relationship between adaptation and mitigation costs. A few figures have been included.

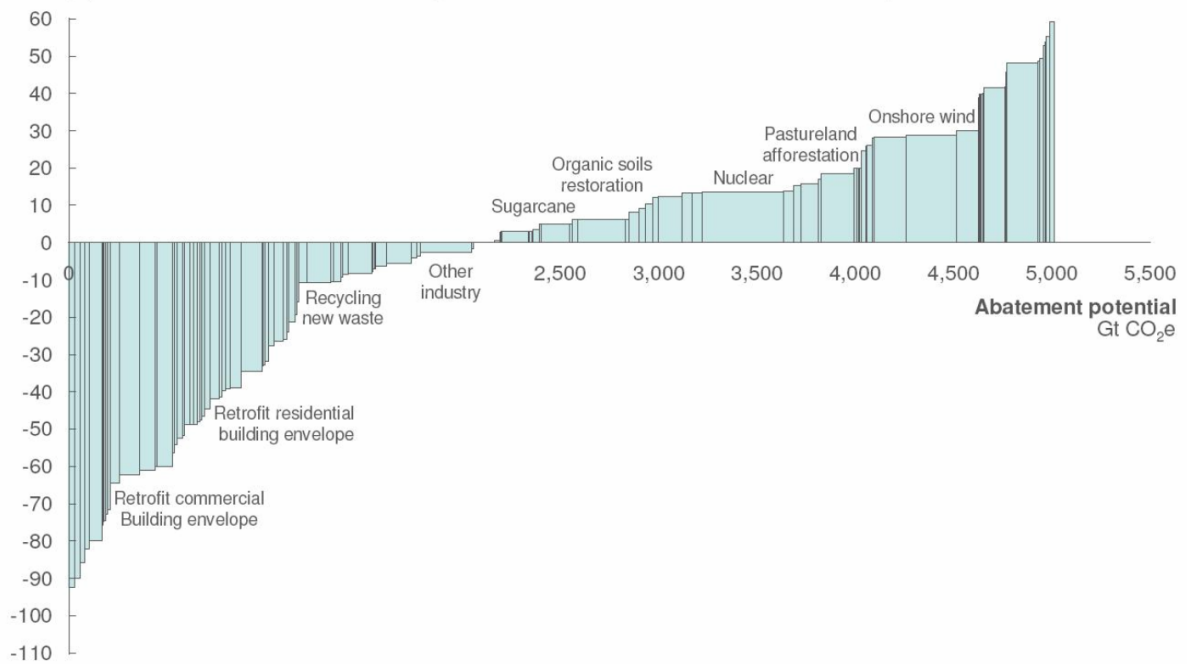


EMF22 compared several model scenarios considering Annex I carbon prices in 2020. Some figures are included.



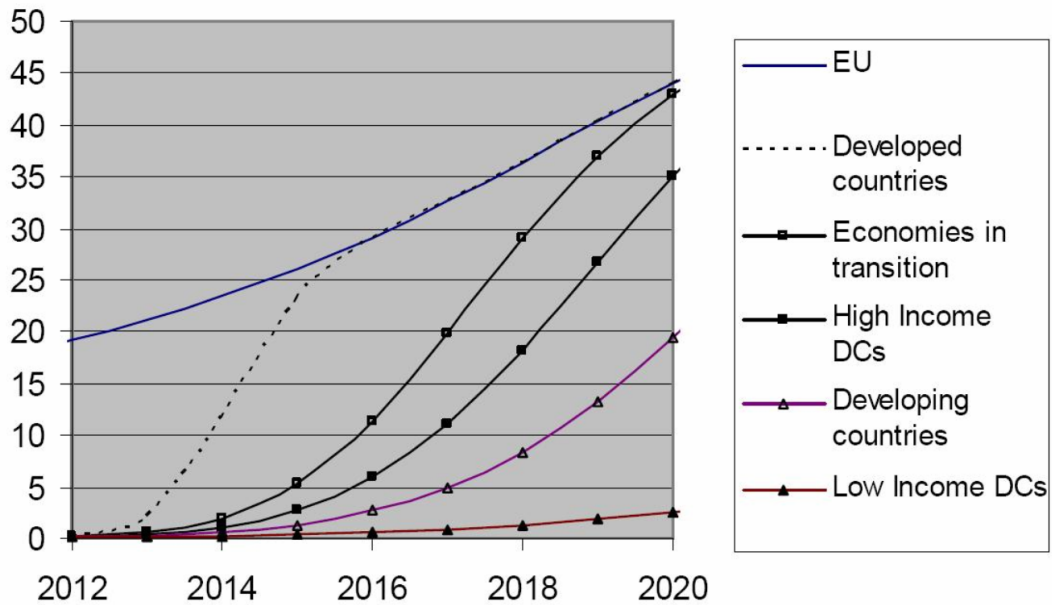
Many MACs have been included. Shown here a comparison of MAC curves based on IIASA (2009). The Toolkit 2009 also includes MACs from EMF22 and the GAINS model.

2020 (up to costs of €60/t, excluding transaction costs, 4% discount rate)

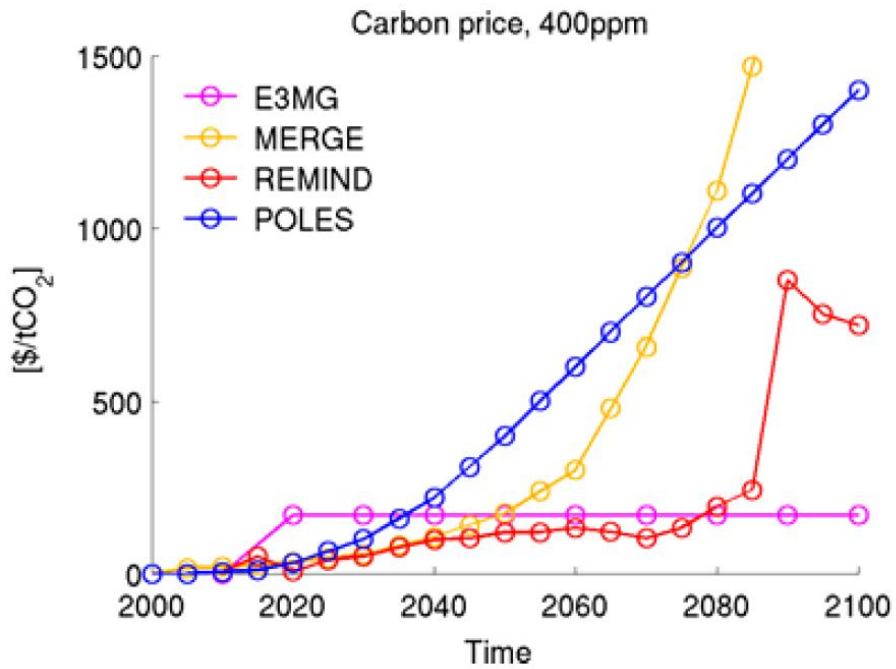


The European Climate Foundation (2009) finished several studies under the Project Catalyst, using the McKinsey study. Some figures on abatement costs have been included.

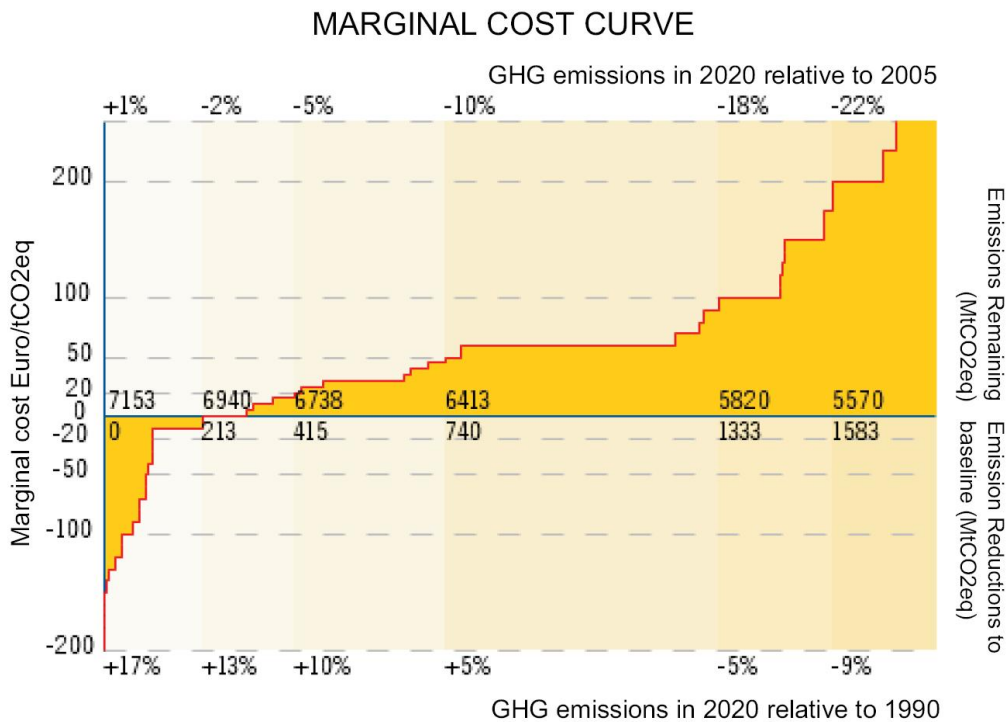
IV-Ar - Carbon price developments over time in the global carbon market (€ per ton CO₂)



The EU Commission Staff conducted a study on carbon price development, which is included.



Knopf et al (2008) developed some interesting figures on carbon price and GDP loss for a 400 and 550ppm pathway (ADAM project).



IIASA published a lot of material based on the GAINS (2009) model. This includes MAC curves (given for USA here), GHG projections by gas (2020) and GHG projections by sector (2020).

Feedback and future possibilities

The project team wants to ensure that the tool is useful and used by as many negotiators as possible, and so following the completion of the first stage, the team will ensure that knowledge of the tool's existence is disseminated as widely as possible through relevant networks.

Once the updated Toolkit 2009 is ready, we plan to get formal feedback from the following stakeholders:

- VROM (the Dutch Environment Ministry)
- EU negotiators and other experts (from Bangkok)

We then plan to try and secure funding for a following stage of development. The ownership of the tool would reside with Brinkman Climate Change and ECN, and we welcome suggestions about the best organizational structure to take responsibility for securing further funding, including a probable web based version.

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Project Management

The project management is in the hands of Brinkman Climate Change. All communication should therefore be directed to:

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At all times, Brinkman Climate Change and ECN are responsible for the contents of the Toolkit.

Appendix I: Overview contents Toolkit 2009

- Ia - IPCC Stabilisation Categories
- Ib - Characteristics of Greenhouse gas Stabilisation scenarios
- Ic - Characteristics of post-TAR stabilisation scenarios
- Id - Stabilisation targets and chance of meeting temperature target
- Ie - Temperature Change
- If - Emission envelopes for stabilisation at 450 550 and 650
- Ig - Peaking and stabilization concentration profiles
- Ih - Emission pathways for meeting stabilisation targets
- Ii - Implications of delaying global actions for emission pathways
- Ij - Global corridors for meeting long-term stabilisation levels
- Ik - Reduction target ranges for stabilization scenarios
- Il - Trade off reduction non Annex I
- Im - Trade off Annex I against non Annex I
- In - Impact of deforestation on trade-off Annex I non-Annex I

- IIa - Indicators
- IIb - Short term projections
- IIc - Scenario Intensity Indicators
- IId - Shares in GHG development
- IIe - Emission reduction gaps for 2020 and 2050
- IIf - Projections of non Annex I emissions
- IIg - GHG emission with frozen and baseline technology
- IIh - Bunker emissions
- IIi - Baseline projections of marine bunker emissions
- IIj - Share of marine bunker emissions
- IIk - Projections of global marine bunker emissions
- IIl - Projections of global land use emissions of CO₂
- IIm - Global projections and trends versus IPCC scenarios
- IIn - National Targets Kyoto Protocol
- IIo - IMO CO₂ Emissions
- IIp - Factors underpinning Future Actions Trajectories
- IIq - Simple climate fact sheets per country

- IIIa - Global economic mitigation potential 2030
- IIIb - Sectoral economic mitigation potential 2030
- IIIc - Global Business as Usual and reduction potential for different sectors
- IIId - TDBU Savings Bottom Up compared to IPCC AR4
- IIIe - TDBU Savings Top Down compared to IPCC AR4
- IIIf - TDBU Relative emission reduction compared to baseline for 2030
- IIIg - TDBU Relative emission reduction compared to baseline for 2030, per sector
- IIIh - TDBU Relative emission reduction compared to potential in 2030
- IIIi - Cumulative emission reduction
- IIIj - Cumulative emission reductions up to 2100
- IIIk - Mitigation strategies
- IIIl - Share of renewable energy in primary energy supply
- IIIm - Electricity production indicators 2005
- IIIn - Steel production - CO₂ reduction potentials and indicators

- IIIo - Cement production - CO2 reduction potentials and indicators
- IIIp - Mitigation Potential Forestry TDBO AR4
- IIIq - Mitigation Potential Forestry AR4
- IIIr - Mitigation Potential Forestry for 20 and 50 US\$
- IIIs - Cost of achieving mitigation potential
- IIIt - LULUCF mitigation scenarios
- IIIu - Carbon price and mitigation costs from meat consumption scenarios
- IIIv - GHG and Land Use Change emissions from meat consumption scenarios
- IIIw - Meat consumption scenarios
- IIIx - Marginal costs of emission reductions with AD activities
- IIIy - ADAM emission scenarios
- IIIz1 - GAINS GHG emissions
- IIIz2 - GAINS sector emissions

- IV-Aa - Global abatement cost as % of GDP for meeting pathways
- IV-Ab - Global abatement costs as % of GDP
- IV-Ac - Estimated global macro-economic costs in 2030 and 2050
- IV-Ad - Net Present Value of abatement costs
- IV-Ae - NPV abatement cost levels
- IV-Af - Regional abatement costs as % of GDP in 2020 and 2050
- IV-Ag - Permit price for 450 and 550 ppm
- IV-Ah - POLES reference scenario abatement cost for European countries (2010 and 2020)
- IV-Ai - Global cost curve
- IV-Aj - OECD mitigation adaption costs
- IV-Ak - OECD mitigation costs comparisons models
- IV-Al - Global impacts of climate change
- IV-Am - WAB balancing carbon price 2010
- IV-An - WAB balancing carbon price 2020
- IV-Ao - EMF global cost delay
- IV-Ap - EMF China cost delay
- IV-Aq - Annex I carbon prices 2020
- IV-Ar - Carbon price developments over time in the global carbon market (€ per ton CO2)
- IV-As - McKinsey aggregate reduction vs 1990
- IV-At - McKinsey cost curve
- IV-Au - McKinsey financial flows
- IV-Av - ADAM carbon price
- IV-Aw - ADAM GDP loss
- IV-Ax - GAINS Total costs

- IV-Ba - Regional MAC curves
- IV-Bb - MAC curve 2020
- IV-Bc - MAC curves POLES model for 2020
- IV-Bd - Marginal CO2 prices
- IV-Be - EMF MAC curves USA 2020 and 2050
- IV-Bf - IIASA MAC curves relative to baseline
- IV-Bg - GAINS MAC curves

- IV-Ca - CDM Market potential excluding avoided deforestation
- IV-Cb - Theoretical Global CDM Cost Curves incl. and excl. deforestation
- IV-Cc - Country Regional CDM Cost Curves

Va - Mitigation potentials and costs on a country basis
Vb - Energy related R and D expenditures on a country basis
Vc - Energy import dependency in scenarios

Vd - UN Human Development Index
Ve - Historic Responsibilities
Vf - Reduction of SO₂ and NO_x emissions compared to the baseline
Vg - Reduction of air pollutants due to GHG mitigation
Vh - Avoided external costs due to GHG mitigation
Vi - Multicriteria Selection Countries