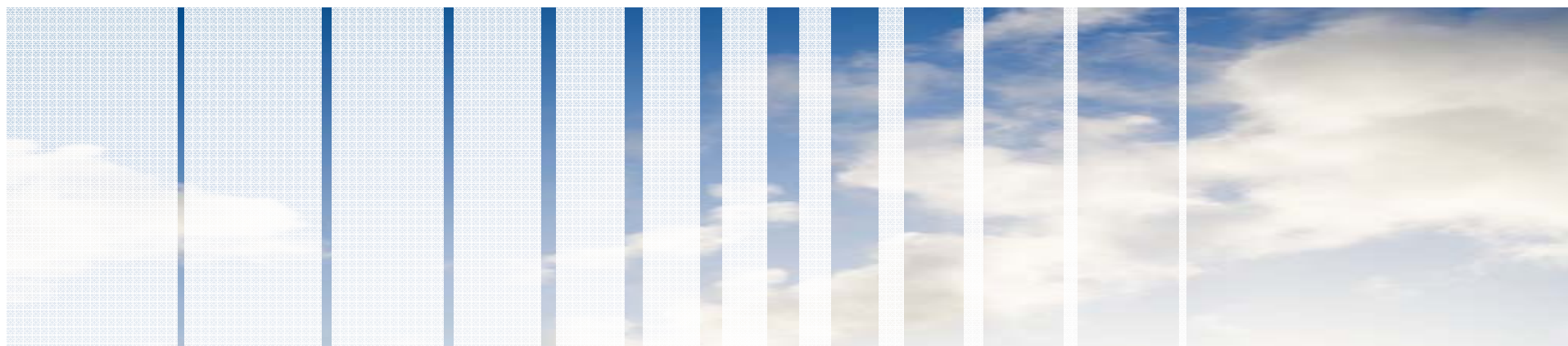




Netherlands Environmental Assessment Agency

Exploring comparable post-2012 reduction efforts for Annex I countries

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Objective and outline presentation



Objective: Analysis of comparable emission reduction efforts for Annex I countries in 2020

Outline

1. Defining 'comparable effort'
2. Methodology
3. Analysis
4. Conclusions

What is “comparable effort”?

- In 2007, the EU adopted a 30% reduction objective by 2020 compared to 1990 levels within a future international climate agreement, provided that other developed countries commit themselves to **comparable emission reductions**
- Bali Action Plan on mitigation efforts for developed countries: “... including quantified emission limitation and reduction objectives, while ensuring the **comparability of efforts** among them, taking into account differences in their national circumstances;
- Basic idea: equal treatment of equal countries, i.e. countries in similar circumstances should make similar contributions
- Questions: What are approaches for comparing commitments amongst countries?

Indicators for Considering Comparability

Two conceptual approaches for “comparable efforts” :

- 1. Equal effort:** based on country’s sharing the effort or burden according to a defined indicator.
 - *Efforts are needed to change the current state or to change a likely baseline or reference development*
 - *For example, equal reduction below BAU, equal MAC and equal costs as %-GDP*
- 2. Equal endpoint:** the countries’ effort is based on achieving the “*same state in the future*”
 - *For example, equal emissions intensity per sector, or per capita emissions, Triptych.*

Advantages & Disadvantages Equal effort vs. equal endpoint



Equal effort

Advantage:

- Each country's effort is the same as defined by the indicator

Disadvantages:

- Based upon a baseline scenario which can never be actually proven
- Many current differences in lifestyle are assumed to remain in the future (e.g., countries with big cars have *more efficient* big cars)
- Doesn't account for past actions

Advantages & Disadvantages Equal effort vs. equal endpoint



Equal endpoint

Advantages:

- No baseline scenario is not required.
- Actions in the past are acknowledged.

Disadvantages:

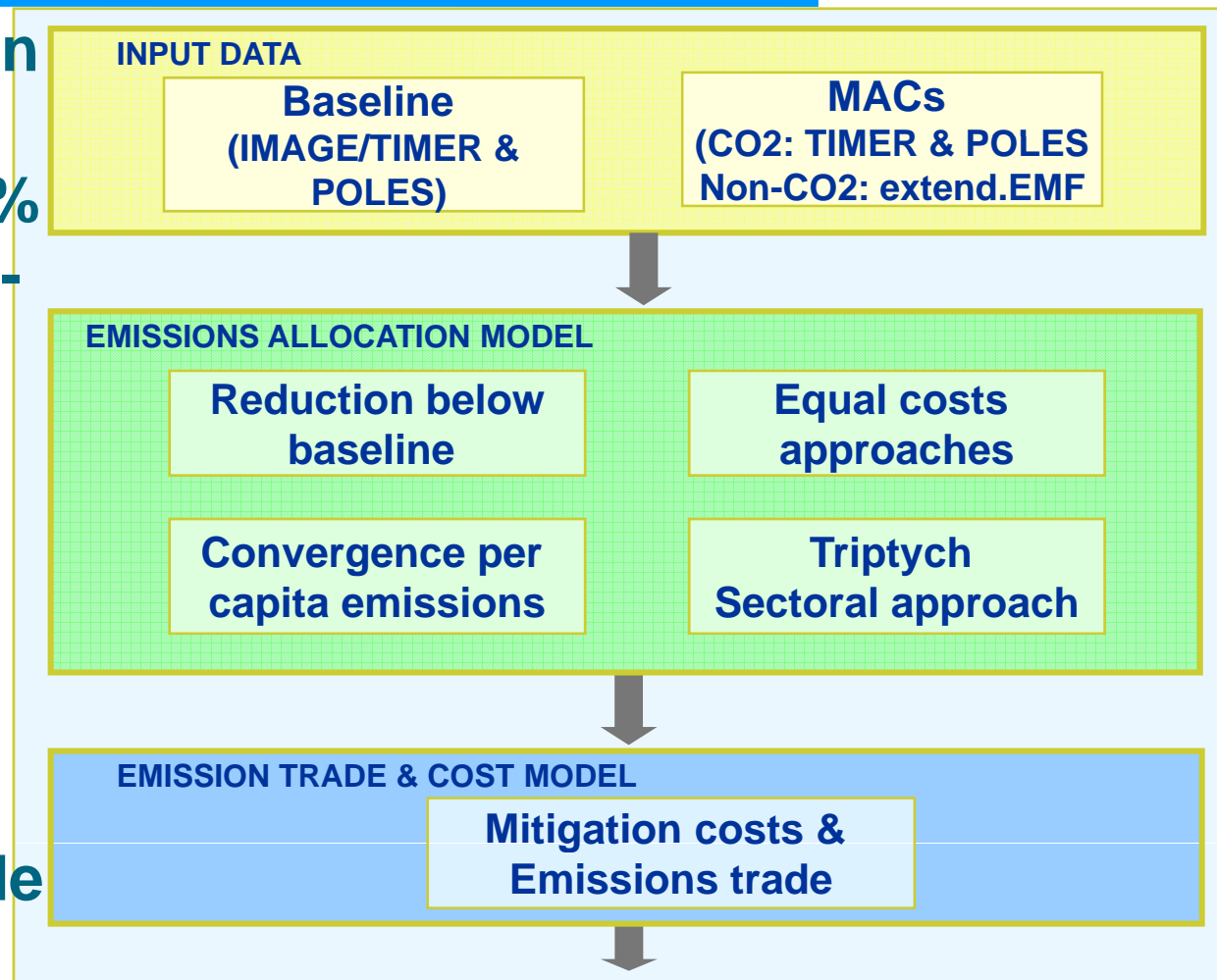
- May be difficult to find an appropriate indicator
- Does not account for structural differences between countries that cannot easily be overcome, e.g. the access to renewable energy resources.

List of **selected** indicators for further analysis (CCAP)

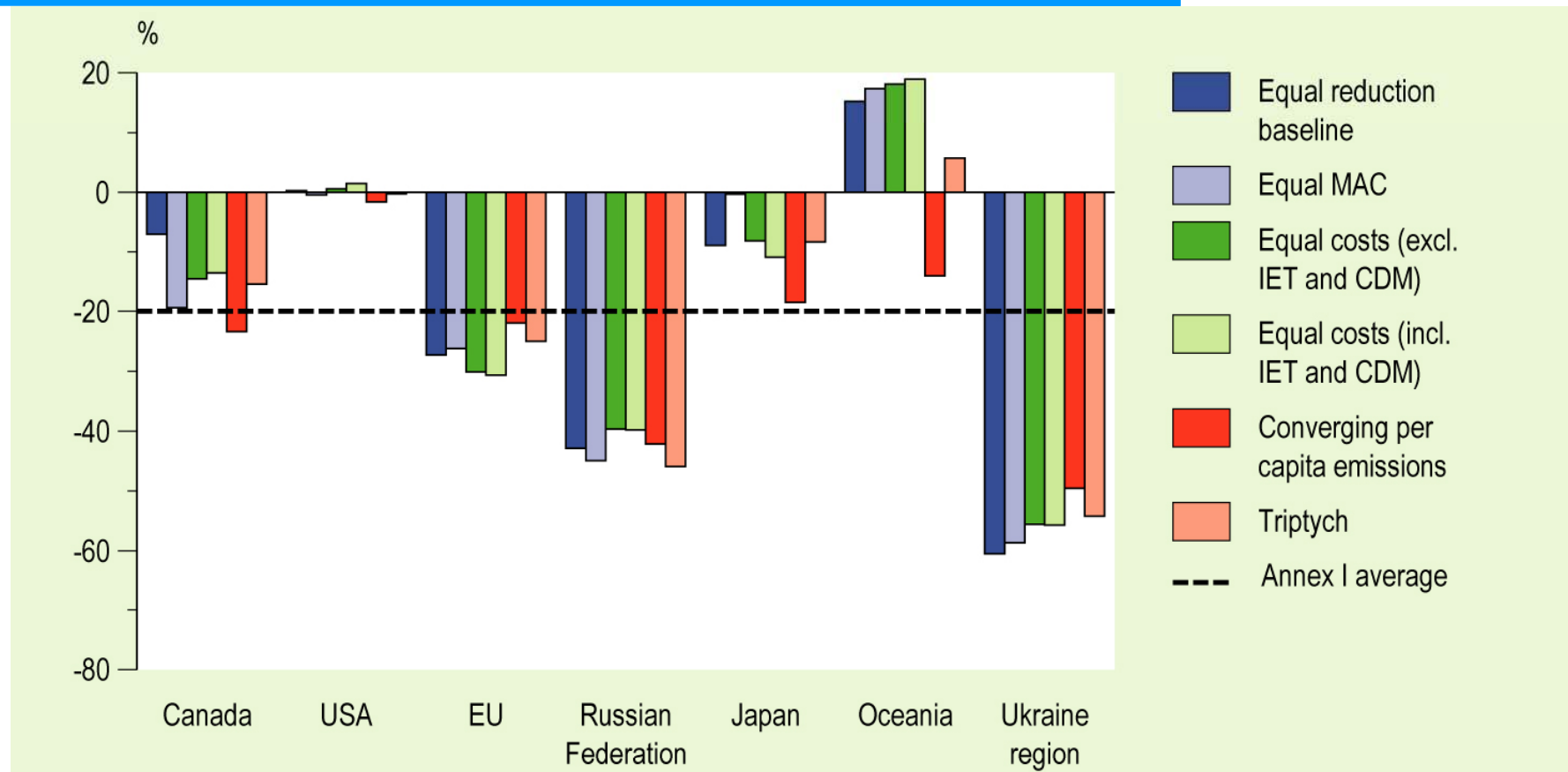
Equal burden	Representation of efforts	Technical feasibility
Proportional to simple criteria for differentiating reductions below base year (e.g. GDP/cap)	Low	High
Equal % reduction below a reference scenario	Medium	Medium
Equal marginal abatement costs	Medium	Low
Equal total abatement costs per GDP	Medium	Low
Equal per capita emissions at an endpoint	Medium	High
Achieving equal efficiency levels per sector	High	Low
Triptych approach	High	Medium

The FAIR model: to analyse post-2012 climate mitigation regimes

1. Annex I reduction objective (like: -20%) and 15-30% reduction in non-Annex I
2. Emissions targets before trade
3. Emissions targets after trade & abatement costs

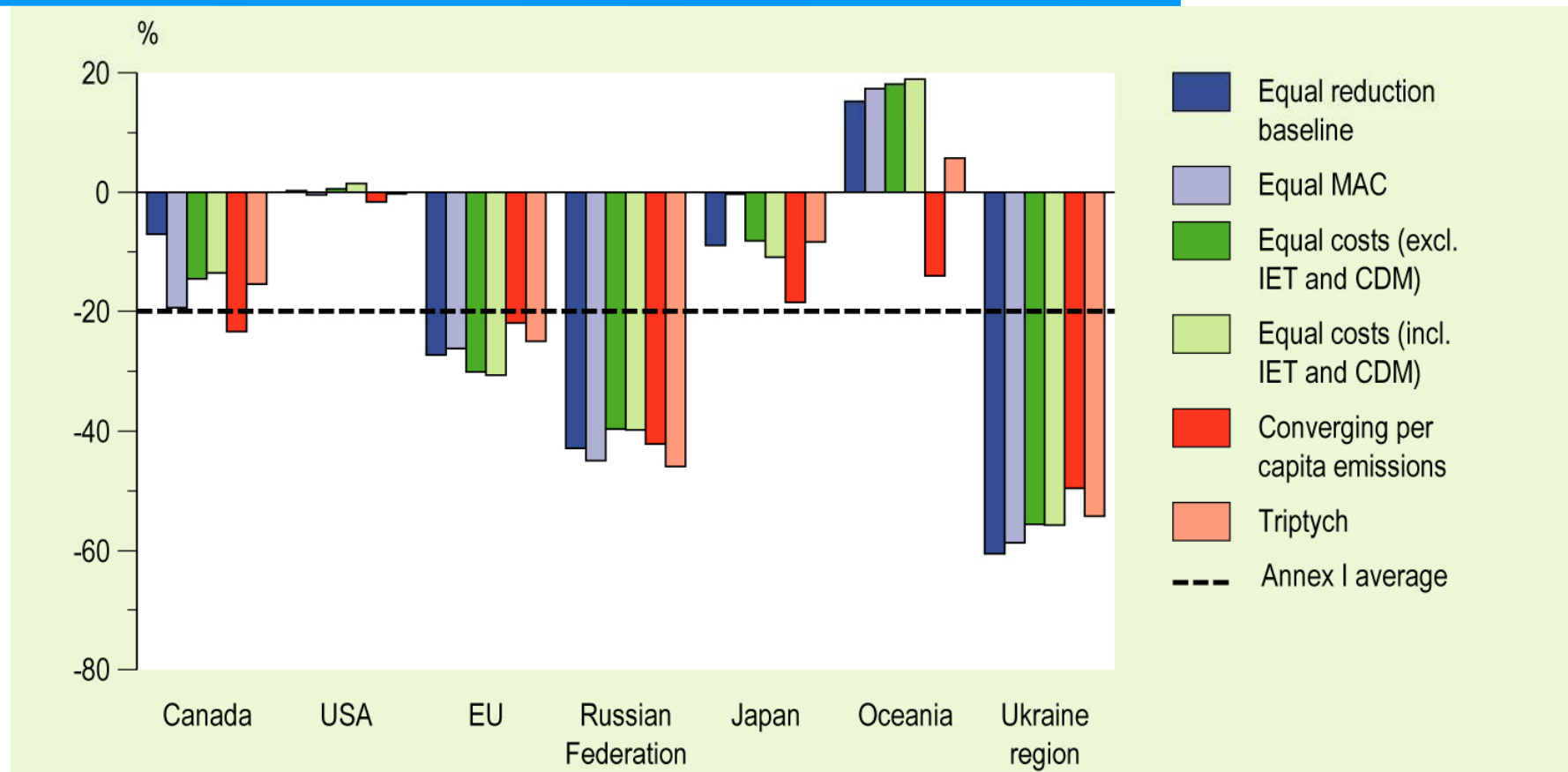


Reductions compared to 1990 Levels, Annex I -20%



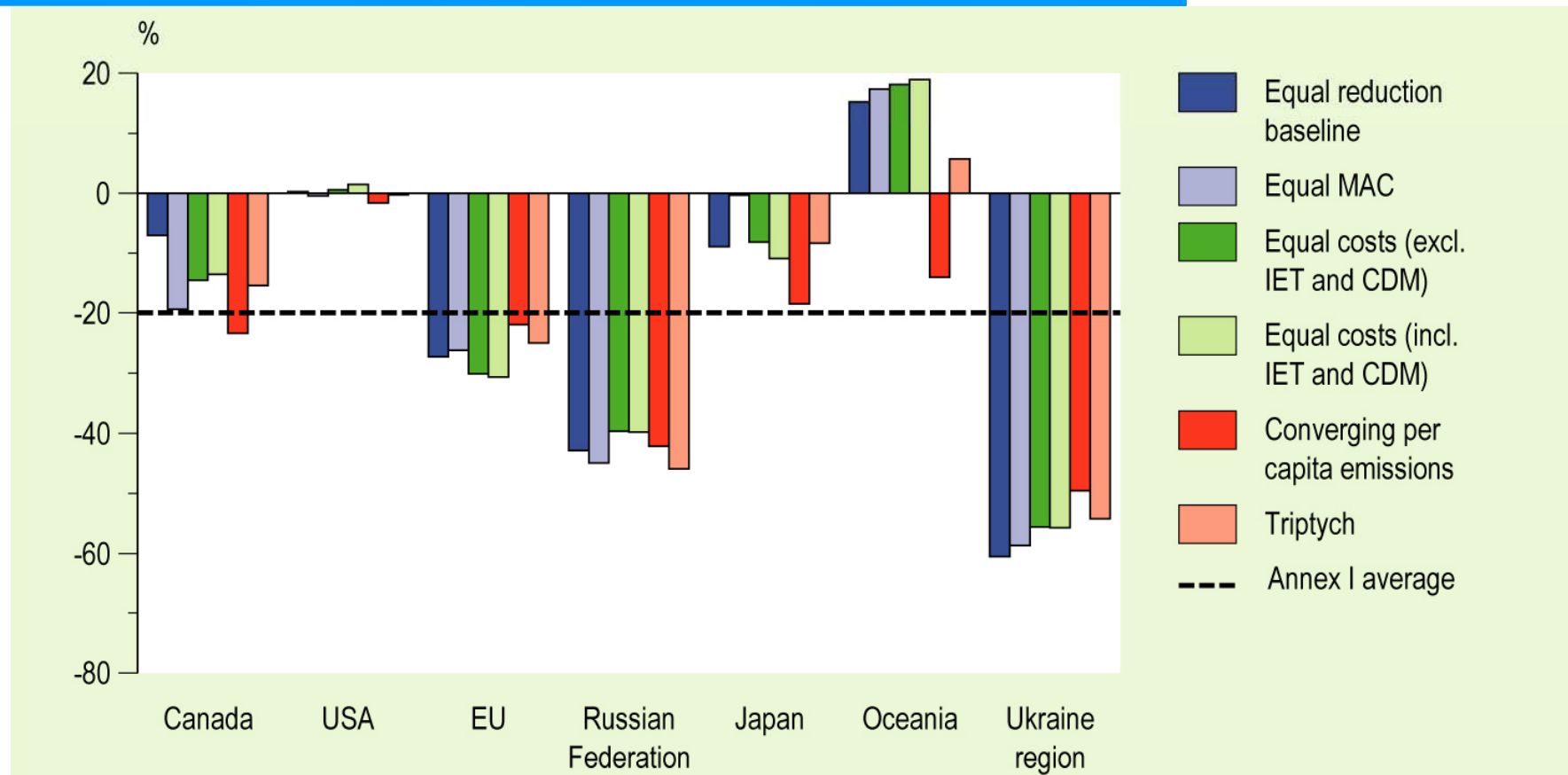
- Highest reductions below 1990 for Russia and Ukraine
- Next, EU, as emissions has levelled off, followed by Canada, Japan
- USA return 1990 level when starting from their national target in 2010

Reductions compared to 1990 Levels, Annex I -20%



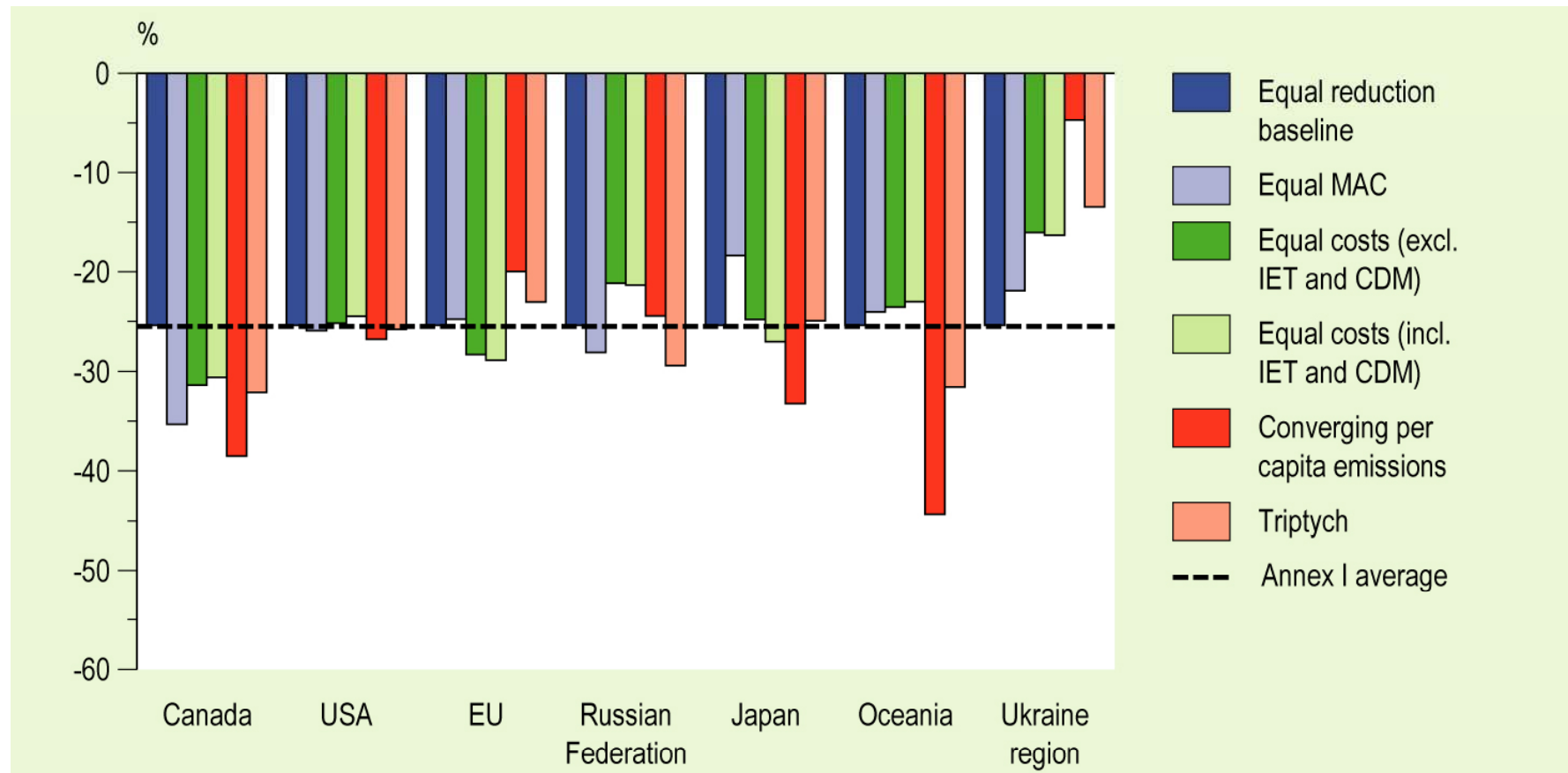
- Red. below BAU less stringent for countries with high growth
- Equal MAC less stringent for countries with little mitigation options
- Equal costs as %GDP similar as equal MAC, except GDP.

Reductions compared to 1990 Levels, Annex I -20%



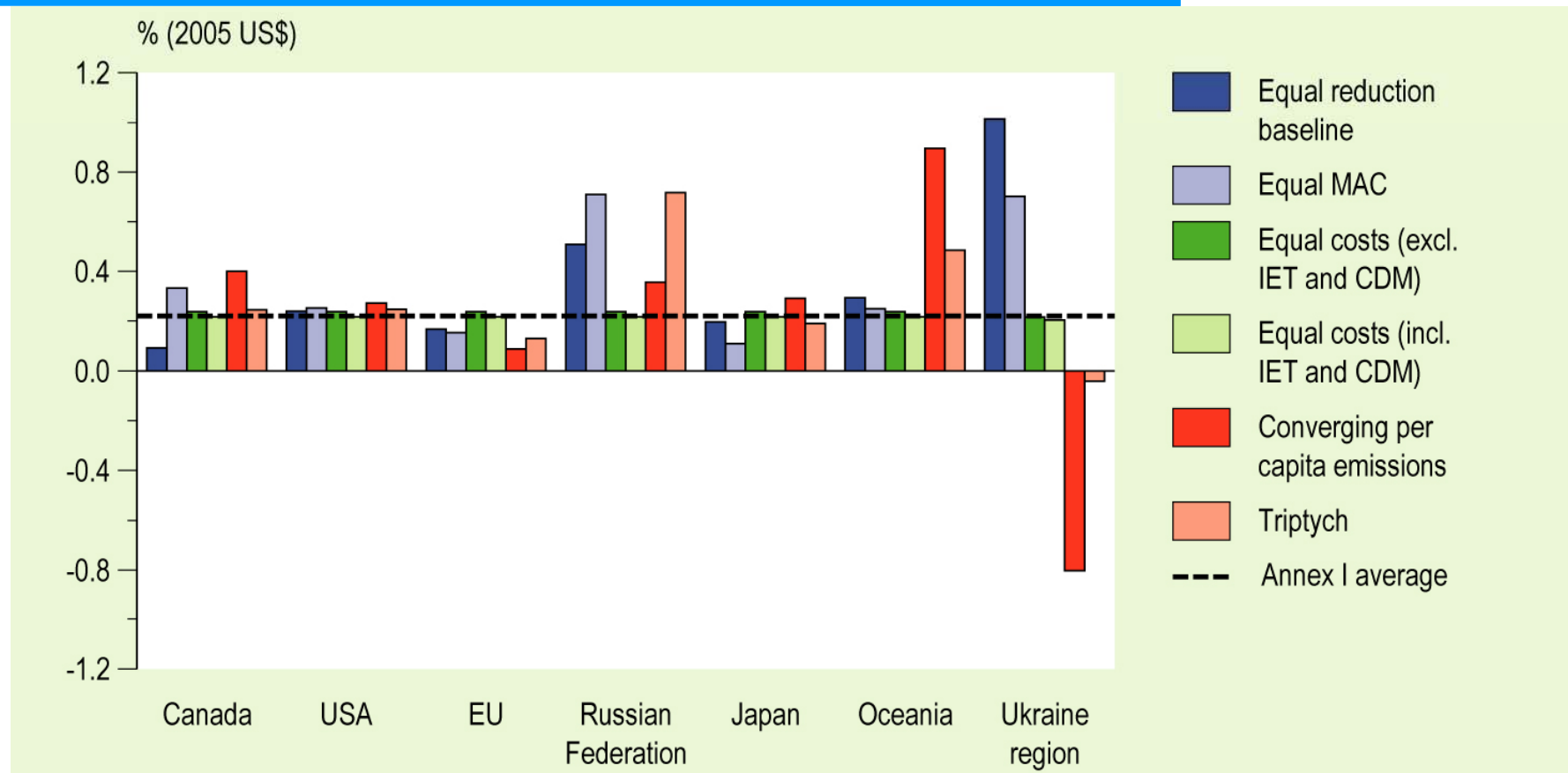
- Equal costs (incl. trade) moves reductions outside (e.g. for JPN)
- Equal p.c. emissions less stringent for countries with low pc emissions
- Triptych less stringent for more efficient countries (EU, Japan)

Reduction compared to baseline, Annex I -20%



- Range of Annex I reductions compared to baseline levels is less (except for Ukraine)

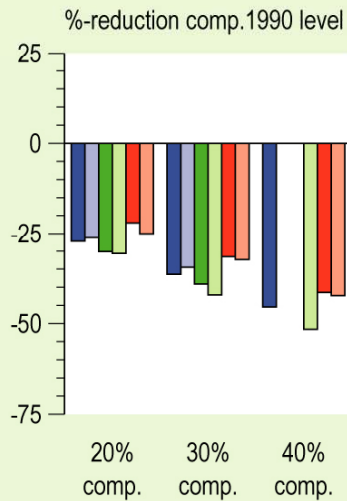
Abatement costs as % of GDP, Annex I -20%



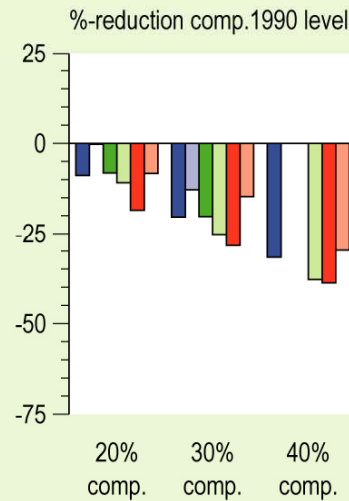
- The abatement costs (as percentage of GDP) also show a wide range again, in particular for Triptych and Converging per capita emissions

The choice of the overall Annex I reduction level (20%, 30% or 40%) is of major importance

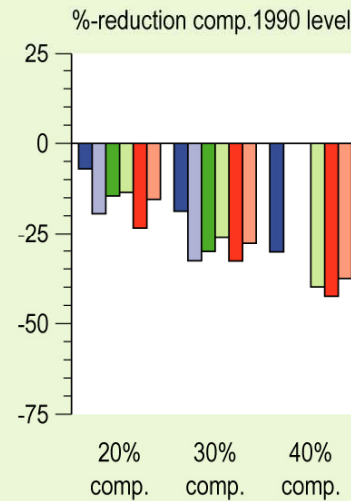
EU



Japan

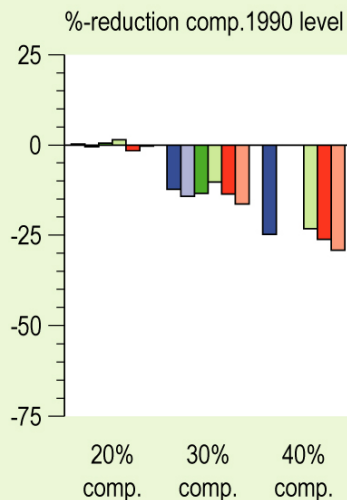


Canada

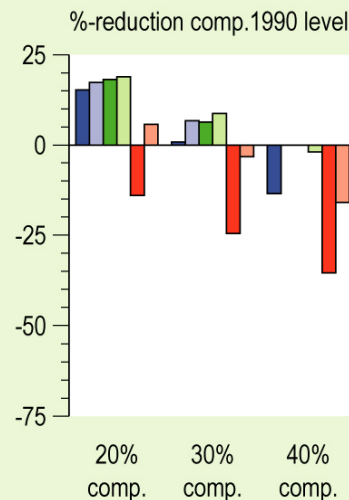


- Equal reduction baseline
- Equal MAC
- Equal costs (excl. Trade)
- Equal costs (incl. Trade)
- Equal per capita emissions
- Triptych

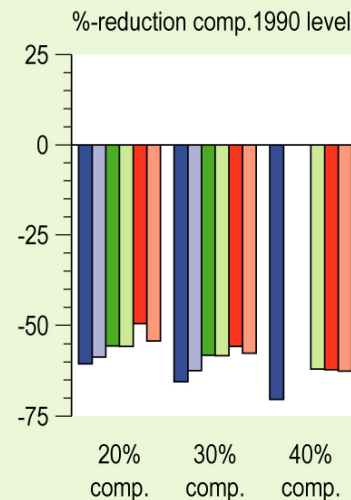
USA



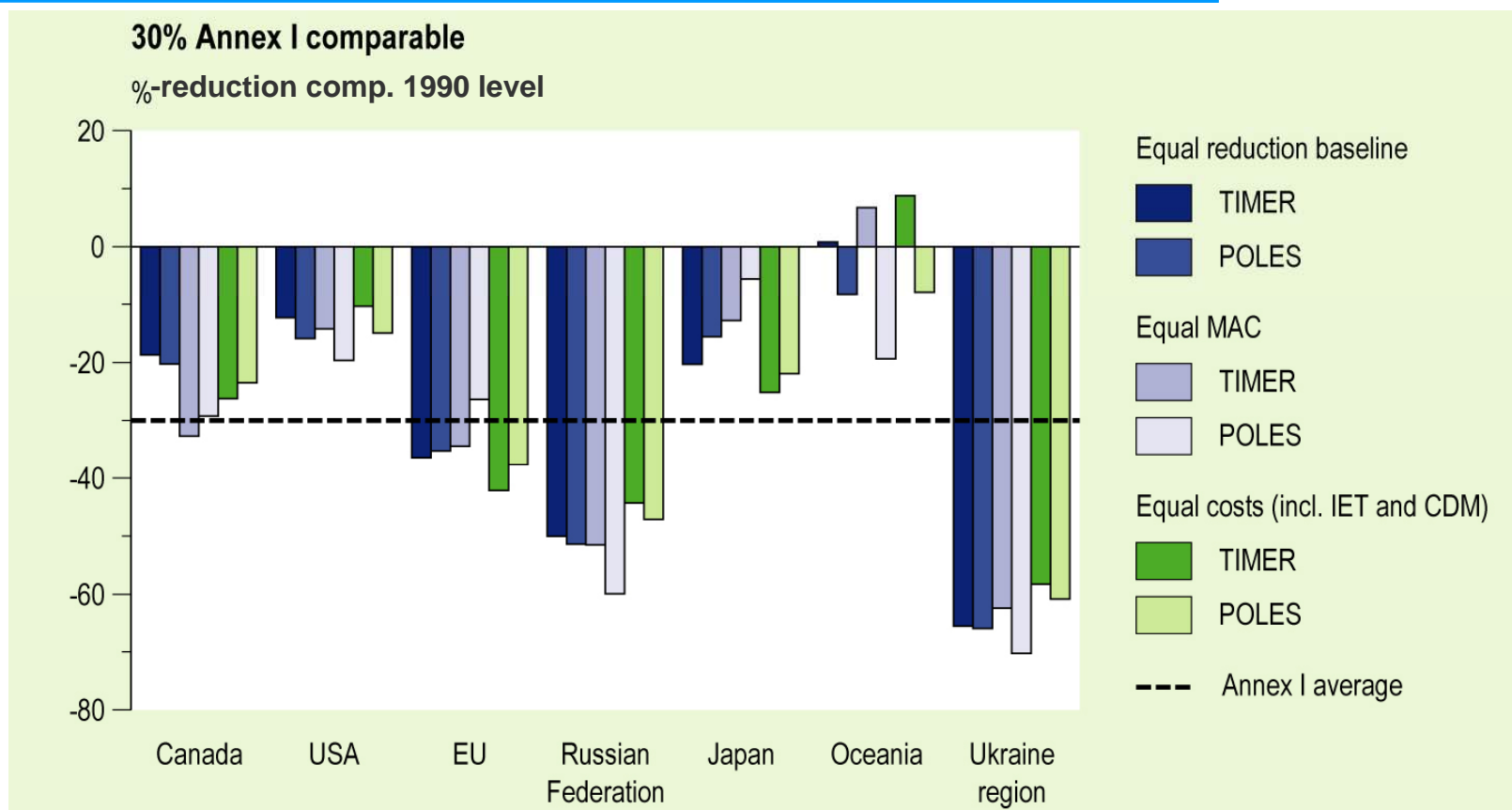
Oceania



Ukraine



The reductions dependent on the assumed Marginal Abatement Costs curves



- To improve robustness of results more models are needed

Conclusions

- Many indicators potentially available to assess “comparability”
 - Equal costs as %-GDP interesting as it accounts the ability to pay principle (GDP) and reduction potentials
 - Equal effort indicators do not account for past action
- Under quantitative results:
 - Compared to 1990: the EU takes the lead (25-30% reduction compared to 1990 levels), the USA has lower reductions
 - The choice of the overall Annex I reduction level is of major importance
 - Reductions by the EU of at least 30% combined with comparable reduction efforts by other Annex I countries and 15-30% reduction of non-Annex I emissions are sufficient to secure the EU 2° C target

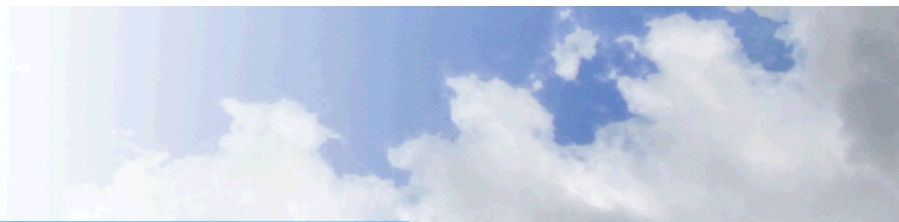
Thank you for your attention



Report (will be available soon):

- den Elzen, M.G.J, Höhne, N., van Vliet, J. and Ellerman, C., 2008. Exploring comparable post-2012 efforts for Annex I countries, MNP Report 500102019/2008, Netherlands Environmental Assessment Agency, Bilthoven, the Netherlands.
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Back-up slides: for information

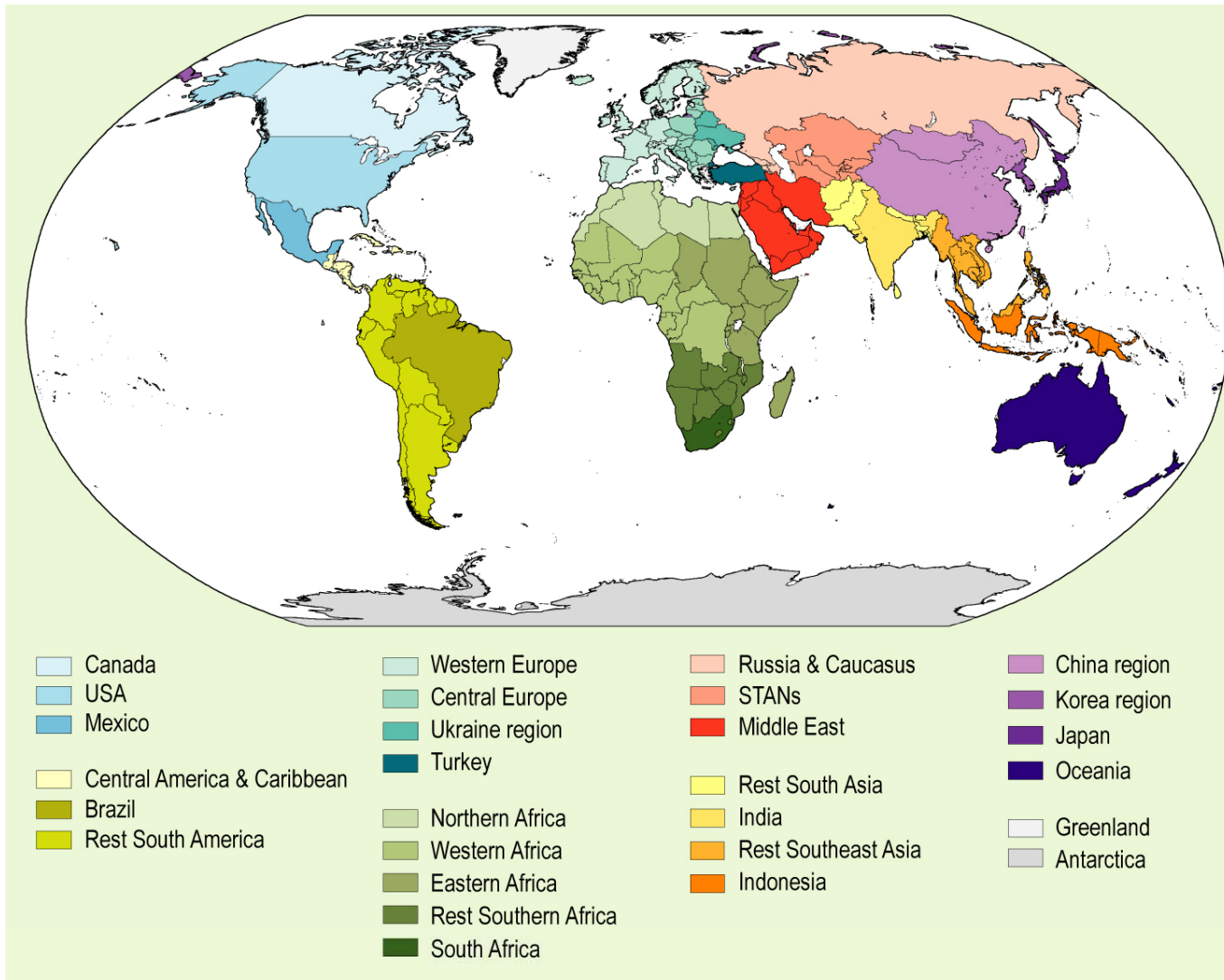


Relevant publications (www.mnp.nl/fair):

- den Elzen, M.G.J. and Höhne, N.: 2008, 'Reductions of greenhouse gas emissions in Annex I and non-Annex I countries for meeting concentration stabilisation targets', Climatic Change, in press <http://dx.doi.org/10.1007/s10584-008-9484-z>.
- den Elzen, M.G.J., Höhne, N. and Moltmann, S.: 2008a, 'The Triptych approach revisited: a staged sectoral approach for climate mitigation', Energy Policy 36 (3): 1107-1124.
- den Elzen, M.G.J. and Lucas, P., 2005. The FAIR model: a tool to analyse environmental and costs implications of climate regimes. Environmental Modeling and Assessment, 10(2): 115-134.
- den Elzen, M.G.J., Lucas, P. and van Vuuren, D.P., 2005. Abatement costs of post-Kyoto climate regimes. Energy Policy, 33(16): pp. 2138-2151.
- den Elzen, M.G.J., Lucas, P. and van Vuuren, D.P.: 2008c, 'Regional abatement action and costs under allocation schemes for emission allowances for achieving low CO₂-equivalent concentrations', Climatic change 90 (3): 243–268
- van Vuuren, D.P., den Elzen, M.G.J., Eickhout, B., Lucas, P.L., Strengers, B.J., 2007. Stabilising greenhouse gas concentrations. Assessment of different strategies and costs using an integrated assessment framework. Climatic Change, 81: 119-159.

YOU CAN DOWNLOAD PAPERS OR CONTACT: michel.denelzen@pbl.nl

Regions in FAIR 2.2 model



Equal Effort Indicators



- Equal % reduction of emissions from base year
 - Difference in past efforts + future trends + mitigation potentials /costs not considered
- Equal % reduction below a baseline scenario
 - Difference in past efforts + mitigation potentials /costs not considered
 - Requires agreement on baseline scenario
- Equal abatement costs or equal MAC
 - Requires agreement on baseline scenario
 - Requires agreement on MAC curves / modeling

Equal Endpoint Indicators

- Equal per capita emissions at an endpoint
- Achieving equal efficiency levels per sector
 - Based upon convergence of large number of sectors
 - High level of data requirements + difficult to define benchmarks
- Triptych sectoral approach
 - Separate convergence of indicators in the electricity, industry, “domestic sectors” (e.g., transportation), and other sectors.
 - Based upon meeting the same technological level in key sectors (e.g., industry as a whole)
 - High level of data requirements
- Achieving the same emission intensity (GHG/GDP)

⇒ Each of these could either be achieved in the next compliance period (e.g., 2020) or next period with defined progress