Summary of Testimony of
Annie Petsonk, International Counsel, Environmental Defense
before the
Subcommittee on Energy and Air Quality
Committee on Energy and Commerce, U.S. House of Representatives
March 27, 2007

"Climate Change – International Issues, Engaging Developing Countries"

In developing legislation to reduce America's greenhouse gas (GHG) emissions, the Subcommittee has asked about the effect of U.S. and other developed countries' actions on developing countries' emission reductions. Enactment of U.S. cap-and-trade legislation affords Congress three crucial opportunities to use the power of the carbon market to engage developing countries in this challenge:

First, when Congress enacts a climate bill, the rest of the world will see that the U.S. Congress leads by example. If Congress creates a clear, enforceable U.S. carbon market that taps American innovation in favor of stabilizing the climate at safe levels, it will establish a powerful template for other nations' actions. If instead Congress litters the U.S. program with "intensity targets" that don't cut total emissions, and with "safety valves" that are really escape hatches, it will simply tempt America's trade competitors to put the same or bigger loopholes in their programs – and drive global emissions higher.

Second, in establishing a cap-and-trade market, Congress can create incentives for developing countries to reduce emissions broadly, rather than engaging them only on scattershot projects. A good place to start would be with tropical forest nations. Tropical forest destruction emits as much CO_2 as the whole United States; deforestation is responsible for 70% or more of national emissions in some countries. Some countries have forest protection initiatives, but they need help. Well-designed carbon markets offer incentives to reduce tropical deforestation. Kyoto offers none. Were Congress to open the U.S. carbon market to credits earned by developing countries that reduce deforestation nation-wide, Congress could strengthen those nations' climate and biodiversity protection efforts and create a model for engaging developing countries broadly.

Third, Congress can design the U.S. carbon market to provide carrots and sticks that encourage other countries – even recalcitrant ones - to join our efforts. Our carbon market is likely to be the largest in the world. Other nations will want to sell us credits. Congress can offer more generous carbon market access to nations that sign up early for emission caps. If nations that haven't yet capped emissions want to sell us credits, Congress can impose conditions on those sales until they do. There are many other options. One that merits close attention is the trade-and-climate linkage proposed by AEP and the IBEW.

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"Climate Change – International Issues, Engaging Developing Countries"

Good morning Mr. Chairman and distinguished members of the Subcommittee on Energy and Air Quality of the House Energy and Commerce Committee.

Thank you, Chairman Boucher, for your invitation to provide the views of Environmental Defense on "Climate Change – International Issues, Engaging Developing Countries."

My name is Carol Annette (Annie) Petsonk, and I am international counsel at Environmental Defense. Environmental Defense is a leading national nonprofit organization representing more than 500,000 members. Since 1967, we have linked science, economics and law to create innovative, equitable and cost-

effective solutions to society's most urgent environmental problems. Environmental Defense is dedicated to protecting the environmental rights of all people, including future generations. Among these rights are clean air, clean water, healthy food and flourishing ecosystems. We are guided by scientific evaluation of environmental problems, and the solutions we advocate will be based on science, even when it leads in unfamiliar directions.

Engaging Developing Countries. . .

Thank you for asking for our views on the extent to which Environmental Defense perceives developing countries as taking, or considering taking, steps to reduce their greenhouse gas (GHG) emissions, and the effect of U.S. and other developed countries' actions on such considerations.

Engaging developing countries in cutting their total greenhouse gas (GHG) emissions is essential if the world is to curb climate change. The United States is the world's largest current and historical GHG emitter. Fast-growing developing countries, however, will soon emit more than we do. Global warming can't be solved unless both the U.S. and large developing countries cut total GHG emissions. The steps Congress takes will be crucial.

A number of large-emitting developing countries have taken, or are considering, steps to slow the increase in their GHG emissions:

- The world's second-largest emitter, China, has adopted more stringent fuel economy standards for passenger cars than has the

United States. China has also adopted a renewable energy goal, and committed significant funding for renewable energy.

- The world's fourth largest emitter, Brazil, has converted most of its passenger car fleet to sugar-cane ethanol. And it has reduced deforestation over 50% in the last two years, in part through conservation measures and environmental law enforcement. That's important: 70% of Brazil's emissions come from deforestation in the Amazon.

But most developing countries are reluctant to take further climate protection steps unless and until the United States does. And most are certainly not likely to take more stringent or faster steps than the U.S. does.

Consequently, if the world is to reduce total GHGs, Congress must lead with workable, enforceable, sufficiently stringent steps that engage developing countries to join us – quickly - in stabilizing the climate at safe levels. Congress must also take tough, shrewd steps to ensure that if developing nations fail to engage, neither America's environment nor her competitiveness will be jeopardized.

. . . Engaging Developing Countries Through the Carbon Market

Developing U.S. cap-and-trade legislation affords Congress three crucial opportunities to use the power of the carbon market to meet these challenges:

1. Lead By Example

When Congress enacts a climate bill, the rest of the world will be watching closely. In effect, when Congress acts, America will lead by example. Such leadership is urgently needed. The international climate treaty talks have stalled because of the unwillingness of the Executive Branch to engage. Time is running out. America's trading partners are recognizing that the only way the United States will act to cut emissions in the narrow time window for averting dangerous climate change, is if the Congress acts. Sensible Congressional action could yield great benefits for America's environment and economy, and provide a template for the world.

As Congress moves to cap and cut America's GHG emissions, there are a number of steps Congress can take that can have a significant positive effect on developing countries' consideration of, and implementation of, steps to reduce their own emissions. Taking these in coordination with other developed countries will increase their effectiveness. But Congress should not wait for other nations to act. Instead, by taking the lead, Congress can show all nations how to break the climate logjam and correct the mis-steps that led to the logjam in the first place.

If Congress creates a clear, enforceable U.S. carbon market that taps American innovation in favor of stabilizing the climate at safe levels, it will set the bar for other nations' actions. If instead Congress litters the program with "intensity targets" that don't cut total emissions, and with "safety valves" that are

really escape hatches, it will simply tempt America's trade competitors to put the same or bigger loopholes into their programs – and drive global emissions higher.

a. On cap design, Congress should lead by example. The most important step for Congress is to cap and cut U.S. total GHG emissions in the range recommended by the U.S. Climate Action Partnership (US-CAP), with broad flexibility for firms to choose how to meet their targets, and vigorous enforcement if they don't. That's the kind of emissions trading market that allows American firms to play to their strengths – their capacity to innovate, to compete on a level playing field, and to profit by finding better, cheaper, faster ways to cut emissions. That's the kind of program that would give the United States the credibility to demand comparable action by our trading partners. In fact, by enacting this kind of framework in 2007-2008, Congress could leverage it into becoming the new template for the international climate treaty talks in 2009-10.

Timing is important. International carbon markets offer great potential for innovative U.S. companies to sell low-emitting technologies and processes. Congress should move swiftly to enact cap-and-trade, in order to open opportunities for U.S. firms in global carbon markets, and to avoid having U.S. firms miss out on carbon market participation. If Congress enacts cap-and-trade legislation in 2007-2008, the federal agencies could finish the implementing regulations in time for our market to link smoothly to the post-2012 international

market. Delaying enactment beyond the 110th Congress, however, could delay our market's launch beyond 2013, potentially disrupting the international carbon markets and depriving U.S. firms of important carbon market opportunities.

More importantly, if Congress enacts this kind of framework and developing nations do follow suit with similar caps on their total GHG emissions, it should be possible to limit the total amount of warming from pre-industrial levels through to atmospheric stabilization, to roughly 2.0° Centigrade - below what many regard as dangerous warming (see Figs. 1-5).

b. But if the U.S. adopts intensity targets, so will developing countries – and total emissions will increase. If instead of capping America's total emissions, Congress adopts "intensity" targets (limiting U.S. GHG emissions per unit of economic output), that approach would not allow the U.S. to link up to international carbon markets built on the cap-and-trade design template. More importantly, however, intensity targets would set an environmentally bad precedent for developing countries. Even if fast-growing developing countries adopted as-stringent targets (which is unlikely), their rapid economic growth, coupled with their intensity targets, would mean that their emissions would be allowed to rise rapidly, swamping our emissions and foreclosing safe climate levels (see Fig. 6). It's more likely that if Congress adopted intensity targets, at least some of our trade competitors would adopt even softer intensity targets, allowing even more rapid emissions increases.

To lead by example, Congress should enact caps on total emissions, not intensity targets.

c. If the U.S. adopts price-based "safety valves," developing countries will use those as an escape hatch too. If Congress enacts a cap and trade program with a cap on total tons of GHG emissions, that program could dovetail well with existing and emerging international carbon markets, and provide a model for developing nations to cap their total emissions too. Suppose, however, Congress adopts price controls (which some have dubbed a kind of "safety valve"), such that if the price of carbon in our market rises above a certain number of dollars per ton, then government prints more allowances for sale to those industries at the controlled price.

Some of America's trading partners might consider this to be an actionable subsidy under the World Trade Organization (WTO). Others, particularly industrialized countries with national cap-and-trade programs, would decide that because the "price cap" busts our emissions cap, it precludes having the U.S. link to other cap-and-trade markets.

But more fundamentally, what kind of leadership-by-example would this escape hatch show to developing nations? Some would be tempted to adopt their own escape hatch, patterned on ours. They might set their prices at our levels, or they might cap prices at significantly lower levels commensurate with their lower levels of economic development. American low-carbon technologies and high-efficiency products might not be able to compete at price-capped levels in these

nations. A downward cascade of protectionist price caps would lead to a race to the bottom, freezing American ingenuity out of other nations' markets and sacrificing effective limits on the emissions of all the countries that deploy this kind of escape hatch.

To lead by example, Congress should recognize that the real danger is not that the costs of abatement will be too high – every serious study, and a now-substantial body of experience with the U.S. Acid Rain Trading Program, teaches that the costs always turn out to be lower than estimated. The real danger is that price caps will simply give developing countries a new and additional economic advantage to use against industrialized countries with emissions caps. To guard against this danger, Congress should refrain from enacting carbon market price controls.

2. Create incentives for developing countries to reduce emissions broadly.

In establishing the U.S. cap-and-trade market, Congress can create incentives for developing countries to reduce emissions broadly, rather than engaging them only on scattershot projects. A good place to start would be with tropical forest nations.

Tropical forest destruction emits as much CO_2 as the whole United States (see Fig. 7). Tropical forest nations are among the world's top emitters. According to WRI/CAIT, the third and fourth largest emitters in the world are Indonesia (#3) and Brazil (#4), and more than 70% of their GHG emissions come

from deforestation (see Fig. 8). In some countries, forest protection initiatives are underway but need help.

Well-designed carbon markets should offer incentives to reduce tropical deforestation. Kyoto offers none.

With Brazilian NGO partners, Environmental Defense has pioneered a proposal called Compensated Reduction, in which any tropical forest nation that reduces its national deforestation emissions below a historical baseline would be eligible for compensation via carbon markets (see Fig. 13). Were Congress to open the U.S. carbon market to credits earned by developing countries that reduce deforestation nation-wide, Congress could strengthen those nations' climate and biodiversity protection efforts and create a model for engaging developing countries broadly.

We believe Congress should include Compensated Reduction of tropical deforestation in U.S. cap and trade legislation. Congress should also direct the Executive Branch, working with tropical forest nations and other nations, to assist developing countries in establishing the infrastructure and institutions needed to measure, monitor, and transparently track emissions from deforestation; to implement and enforce forest conservation measures; and to ensure that market-based compensation redounds to the benefit of local forest communities.

3. Include carrots and sticks as design elements in the carbon market.

Congress can design the U.S. carbon market to provide carrots and sticks that encourage other countries – even recalcitrant ones - to join our efforts. Our carbon market is likely to be the largest in the world. Other nations will want access to our market – for carbon finance, and to sell us credits. Those nations' interest in gaining access to our carbon market gives Congress leverage, just as in any other market access negotiation. Below we describe some "carrot and stick" options for Congress to consider, among the many potential options that could be envisioned.

a. Congress could offer emission "premiums" for countries that sign up to emissions caps early. Congress can offer carbon market access on more generous terms to nations that sign up early for emission caps. Consistent with the objective of stabilizing the climate at safe levels, Congress could offer such countries the opportunity to choose different base years for their cap-and-trade, or the opportunity to adopt a cap-and-trade with more lenient targets, for example.

b. Congress should levy mandatory "multipliers" on emission credits generated in uncapped countries. If nations that haven't yet capped emissions want to sell us credits, Congress can impose conditions on those sales until they

do. This approach would enable Congress to overcome a problem sown into the international carbon market framework over a decade ago.

In 1995, nations adopted the Berlin Mandate, which provided that the emissions limitation commitments to be adopted by industrialized nations at Kyoto two years later would not result in any new commitments for developing nations. As Kyoto's market-based framework began to take shape, however, some developing nations wished to experiment with emissions trading, without capping their emissions. Consequently, under Kyoto, developing nations – which have no emission caps – can earn emission credits from individual projects that reduce emissions below what would have otherwise occurred. They can then sell these credits to industrialized nations with emissions caps, which can use the credits to offset emissions increases in the capped nations.

This mechanism, in principle, allows industrialized countries to reduce the costs of meeting emission caps, by harvesting cheaper emission reduction opportunities in the developing world. But in practice, letting uncapped countries sell credits from projects that cut emissions below business-as-usual does not reduce global emissions. It simply shifts emissions from developing to industrialized countries (see Figs. 9-10).

As noted above, global emissions must begin to decline very soon in order to stabilize the climate at safe levels (see Figs. 1-5). The inexorable conclusion is that it simply will not be possible to stabilize global emissions at those safe levels if developing countries' only role is to undertake scattershot projects whose

credits, earned for cutting emissions below business-as-usual, are then transferred to industrialized nations for use in offsetting the latter's emission increases.[1]

To rectify the environmental problem, and to strengthen incentives for developing nations to reduce their emissions nation-wide, Congress should not only require that such credits meet the traditional tests of baseline, additionality, verification, permanence, and leakage. Congress should, furthermore, apply a mandatory "multiplier" to project-based carbon credits from uncapped nations. Under the multiplier approach, Congress would prohibit U.S. emitters from using such project-based credits on a 1:1 basis to meet their compliance obligations. Congress would instead require U.S. emitters to tender such credits on a 1.1:1, or 1.5:1, or even 2:1 basis for compliance with their domestic emissions caps. Congress should then mandate that the additional tons of credits generated by the multiplier be permanently retired from the system, and not made available for any emitter's compliance purposes (See Figs. 11-12). That would ensure that such projects deliver globally real reductions.

The multiplier approach is superior to the approach of placing quantitative restrictions on the amount of these reductions that can be used for compliance (as the European Union has done). The quantitative restriction approach discourages investors from investing in emission reduction projects beyond the

[1] "Even if emissions from developed regions ... could be reduced to zero in 2050, the rest of the world would still need to cut emissions by 40% from BAU to stabilise at 550 ppm CO2e. For 450 ppm CO2e, this rises to almost 80%." Stern Review, Chapter 8.

quantitative limit. The multiplier approach, by contrast, encourages investors to search for emission reduction opportunities economy-wide in uncapped nations, while ensuring that the trading of those reductions yields global environmental benefits. The multiplier approach also delivers a continuous incentive for uncapped nations to consider taking caps in order to gain full access to America's carbon market. It should be noted that implementing the multiplier approach would require coordination with other industrialized nations, who would need to adopt similar multipliers in order to ensure that the goal of the U.S. program could not readily be evaded.

c. Congress should instruct the Executive Branch to negotiate carbon market access agreements with other countries. The fundamental challenge of climate policy is to induce the world's major emitting sovereign nations to cap and cut their carbon emissions fast enough to meet the objective, ratified by the United States in 1992 with the unanimous consent of the U.S. Senate, of stabilization of atmospheric concentrations of greenhouse gases at a level, and in a timeframe, so as to avert dangerous anthropogenic interference in the climate system. The time window is narrowing. Failure to start global emission cuts in the next decade could foreclose that objective – permanently.

As noted above, the 1995 Berlin Mandate did not deliver strong incentives for engaging developing countries – in fact, it had the opposite effect. Congress can and should create an entirely different negotiating dynamic, leveraging the

power of access to what will likely be the world's largest carbon finance market, to encourage high-emitting developing countries to cap and cut their emissions. Thus, by building directly into the design of the U.S. cap and trade system powerful incentives to encourage the early and robust participation of all other major emitting nations in capping and cutting GHG emissions, and by directing the Executive Branch to negotiate carbon market access agreements on America's terms, Congress can create a new framework that cracks the competitiveness conundrum and shows the nations of the world a path forward to successful climate policy.

To accomplish these goals, Congress should create a new framework that is designed to increase, significantly, the Executive Branch's consultation with Congress, its consultation with affected stakeholders, its ability to move swiftly, and its negotiating leverage with other nations, on a matter in which both consultation and timing are of enormous importance to Congress.

As a first step in creating that framework, Congress, exercising its constitutional power to regulate commerce with foreign nations, should instruct the Executive Branch to negotiate carbon market access agreements with other nations, under which, by dates certain, those nations will cap their national GHG emissions and establish mutually compatible cap and trade systems.

As a second step in this new framework, Congress should establish negotiating objectives for these carbon market access agreements, namely that other nations should agree to:

- cap or otherwise substantially reduce[2] their total emissions (no intensity targets);
- refrain from adopting cap-busting safety valves that act as escape hatches;
- apply mandatory multipliers to emission credits from uncapped nations;
- coordinate on measurement, reporting, registration, tracking, and accountability for GHG emissions;
- refrain from discriminating against bona fide emission reductions earned in the United States – including in our agriculture and forest sectors; and
- keep under ongoing review their – and our - progress in actually achieving the emission reductions set forth in the agreements, including restrictions on emissions trading if national commitments are not being met.

Such a framework would enable Congress to authorize new emissions trading partners to "dock in" to our emissions trading program. It would invite America's trading partners to include, in any post-2012 climate agreement they might adopt, a reciprocal provision allowing the U.S. to "dock in" to the international post-2012 carbon market.[3] And it would allow Congress and the American public to keep

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[2] For tropical forest nations whose principal source of emissions is deforestation, agreements to implement Compensated Reduction would be eligible to meet these criteria.

[3] Under the current Kyoto Protocol, only Parties may participate in the carbon market, because only Parties have Kyoto-cognizable carbon allowances to trade. If the 110th Congress enacted strong cap and trade legislation for the United States, but the Executive Branch did not participate in the climate treaty talks in 2007-2009, it is possible that a new post-Kyoto agreement would be adopted without significant participation of the United States. By signaling to the international community through domestic legislation, however, that Congress wishes the United States to participate in the international carbon market, Congress could encourage the climate treaty Parties to adopt a reciprocal docking-in provision in the new agreement authorizing carbon market transactions with non-Parties (i.e., the United States) provided that the non-Parties had adopted comparable carbon caps and a comparable trading program. For precedent, see the Convention on International Trade in Endangered Species of Fauna and Flora (CITES), which

under continuing transparent review the GHG emission reduction performance of the United States and other nations.

The absence of such a framework for coordinating climate change policy between Congress and the Executive Branch has resulted in nearly two decades of poor communication between the branches, with the American people, and with our trading partners; and dangerously slow progress in the international arena. A new framework is essential.

d. Learn from Europe's experience. A U.S. cap and trade market is likely to be more effective if it links to cap and trade markets in other nations, provided that each can maintain integrity. The European Union's cap and trade market for carbon dioxide, while imperfect, is already delivering emission reductions beyond what scholars estimate would have occurred in the market's absence.[4] With the EU's announcement of its target through 2020, trading in vintage 2008-2009 allowances remains strong, and the first trades in carbon futures beyond 2012 have already taken place – another sign that the markets are ahead of the law-makers. (See Fig. 14) While a detailed discussion of the EU's system is beyond

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provides, in its Article X: "Trade with States not Party to the Convention. Where export or re-export is to, or import is from, a State not a Party to the present Convention, comparable documentation issued by the competent authorities in that State which substantially conforms with the requirements of the present Convention for permits and certificates may be accepted in lieu thereof by any Party."

[4] See "Over-Allocation or Abatement? A Preliminary Analysis of the EU ETS Based on the 2005 Emissions Data," Denny Ellerman and Barbara Buchner, NOTA DI LAVORO 139.2006 (November 2006), CCMP – Climate Change Modeling and Policy Program of the Massachusetts Institute of Technology and the Fondazione Eni Enrico Mattei (FEEM), see: http://www.feem.it/Feem/Pub/Publications/WPapers/WP2006-116.htm#summary

the scope of this testimony, a quick sketch of its strengths and weaknesses, together with recommended policy changes, can provide guidance to Congress.

European Union Emissions Trading Scheme (EU-ETS): Strengths and Weaknesses			
EU-ETS	Strengths	Weaknesses	Lessons for US System
Time horizon	Three-year pilot phase (2005-2007) provided firms with experience in cap-and-trade	Pilot phase too short to stimulate major capital investment decisions.	Predictable, long time horizon is essential to spur environmental investment and provide economic stability
Cap on total emissions	Cap is on total emissions, not "intensity"	Pilot phase cap too lenient; when its true lenience was made known, carbon market prices crashed	Cap should be placed on total emissions, not "intensity"
Coverage	50% of economy covered	No clear plan for transportation sector; plans to include EU aviation emission	Congress should enact caps with wider coverage. Transportation and aviation sectors need to be addressed.
Level of Initial Cap	Modest initial cap was intended to "make compliance easy"	EU established initial caps based on emitters' projected emissions; emitters greatly overestimated projected emissions	Caps should be derived based on historical emissions, not future projections
Transparent Reporting		EU reporting system needs to be made electronic	Require annual emission reports
Interface with electricity framework	Ambitious caps can stimulate cleaner fuels	Poor interface with electricity sector pricing regulation allowed some windfall	Improve interface to promote innovation up and down value chain
Domestic offsets		Initially not included; some nations moving to include	Launch with framework for robust offsets
Trading with uncapped nations		10% limit on reduces ambit for low-carbon investment in those nations, without guaranteeing actual environmental benefit; no serious engagement of developing nations	Use market access to drive participation: --Tropical forest nations --Premiums for nations that cap early --Restrict trading with uncapped countries --Consider AEP-IBEW trade-climate link

e. Ensure that America's environmental protection efforts are not undermined by other nations' inaction. At bottom, it is the responsibility of Congress to direct the Executive Branch to administer strong medicine in the event that developing countries do not follow our lead.

In the "strong medicine" category, one proposal that has been put forward is that if after substantial bilateral and regional outreach toward conclusion of carbon market access agreements, high-emitting countries fail to cap or substantially cut their emissions by a specified date, then any high carbon-intensity products that they wish to export to the United States must be accompanied by emissions allowances to cover the emissions incurred during the products' manufacture. Such a provision is admittedly powerful. But something in this category of power will be essential to protect America's environment against the possibility that high-emitting developing nations might continue to produce products without climate safeguards. It will also be essential to ensure that other nations' failure to participate in emissions cuts doesn't simply result in the off-shoring of our emissions.

A version of the "allowances-for-trade" proposal has been put forward by the CEOs of American Electric Power (AEP) and the International Brotherhood of Electrical Workers (IBEW). Environmental Defense believes this concept merits close study and a careful and thoughtful determination about how best to place it, or something of comparable strength, in U.S. legislation.

A Post-Script on Timing

Once the U.S. caps emissions, every day of delay in engaging developing countries means more GHG-intensive infrastructure going in to fast-growing economies. There are two timetables: the atmospheric timetable, and the carbon market timetable.

The atmospheric timetable is clear. The goal is averting dangerous climate change. Every delay increases the risk that U.S. and/or developing country inaction will foreclose opportunities for averting dangerous climate change.

The carbon market timetable is also clear. Congress must get the U.S. carbon market up and running fast enough to ensure that there are good opportunities for U.S. firms to compete in the international carbon market. The existing international carbon market runs out in 2012. The rules and the players for the post-2012 international carbon market are under discussion now. Even with its flaws and uncertainties, the international carbon market is driving investment around the world into low-emitting technologies and processes. Any disruption of that market risks adding, needlessly, to the atmospheric burden of GHG emissions, and depriving American firms of the opportunity to participate in that market.

Working back from the goal of opening the U.S. carbon market by January 1, 2013, and given time for the federal agencies to develop any needed implementing regulations, the 110th Congress should make every effort to enact cap-and-trade legislation by 2008. Stated differently, failure to enact cap-and-trade legislation in the 110th, and to finish the regulations in time to open the U.S. carbon market by, at latest, January 1, 2013, could needlessly disrupt the global carbon market and cost American firms important low-carbon investment opportunities around the world.

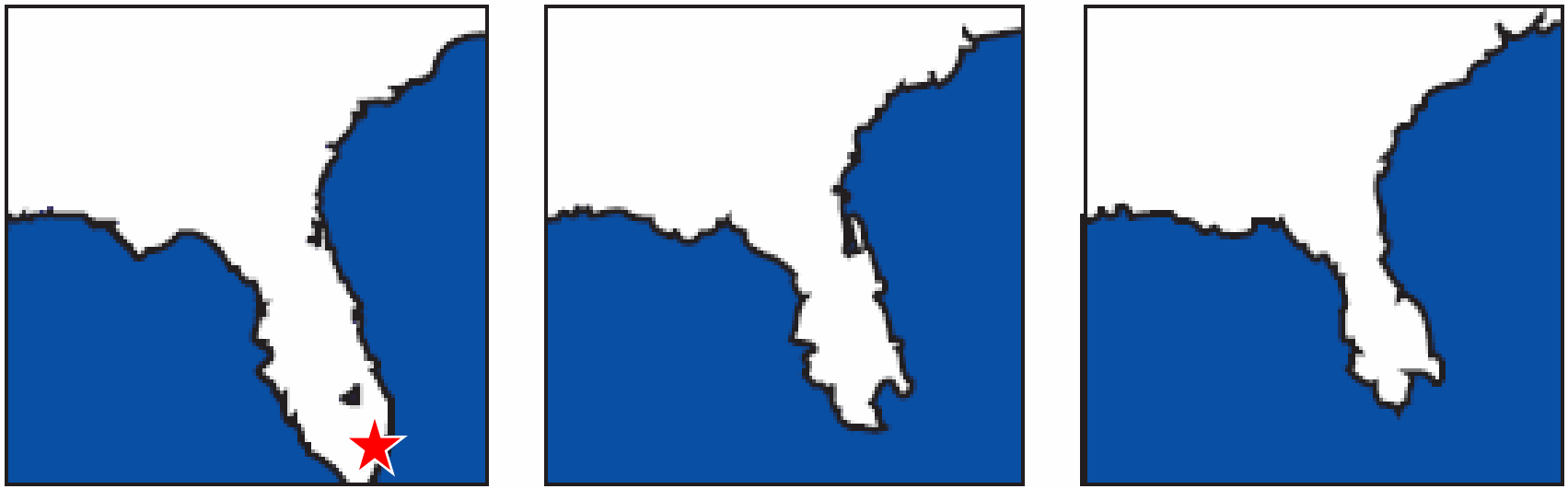
Enactment by the 110th Congress will send the signal to other nations in the international climate treaty talks that they should, by 2009-2010, reach agreement on extending the global carbon market beyond 2012, working from the design template established by the Congress. It will encourage those nations to include in their post-2012 framework a "linking" provision allowing our market to "dock in" to the international market, thereby opening up enormous opportunities to bring American ingenuity, American technology, and American expertise to bear on the GHG emissions challenge world-wide. Enactment by the 110th will also send a powerful signal to high-emitting developing nations that America is going ahead with cap-and-trade, and will look to them to follow suit swiftly, strengthening our leverage in the negotiations that Congress instructs the Executive Branch to undertake. Here is a timetable:

Timetable: U.S. Climate Policy and the International Carbon Market	
2007-2008	The 110th Congress enacts legislation capping America's GHG emissions, establishing our emissions trading market, opening that market to developing nations, including tropical forest nations, that reduce national emissions from a historical baseline; requiring any project-based reductions from uncapped nations to be tendered into that market for compliance at a multiplier of greater-than 1:1; and directing the Executive Branch to launch bilateral/multilateral negotiations with high-emitting developing nations.
2009	Executive agencies begin drafting implementing regulations. Executive Branch, in close consultation with Congress, launches negotiations with developing nations, including in international climate treaty talks. International climate treaty talks adopt a new agreement establishing post-2012 carbon market, with a "docking-in" provision so that if the U.S. wishes, it can dock in on an expedited basis with a view to making use of early actions. Tropical forest nations, with assistance from private capital markets, begin investing in rainforest protection, on a credit-for-early-action basis.
2010-2012	Executive Branch finalizes cap-and-trade regulations; pursuant to instructions from Congress. Working closely with Congress, Executive Branch concludes negotiations to allow developing countries that cap and cut emissions to "dock in" to our carbon market.
January 1, 2013	U.S. cap-and-trade market opens, linked via "docking in" provisions" to international markets.

Mr. Chairman, the framework and timetable we have presented are ambitious. We believe the climate challenge demands ambition. We hope that these concepts will be of assistance to you and all the Committee members as you together begin your close consideration of the Congressional role in engaging developing countries to join with America in meeting the climate challenge. We thank you and all the Committee members for your hard work. We would be happy to answer any questions.

FIGURE 5

Potential coastline retreat as a result of ice sheets melting Florida



The shoreline of Florida today

Florida in the event of a Greenland ice sheet melting

Florida in the event of both the Greenland and West Antarctica ice sheets melting

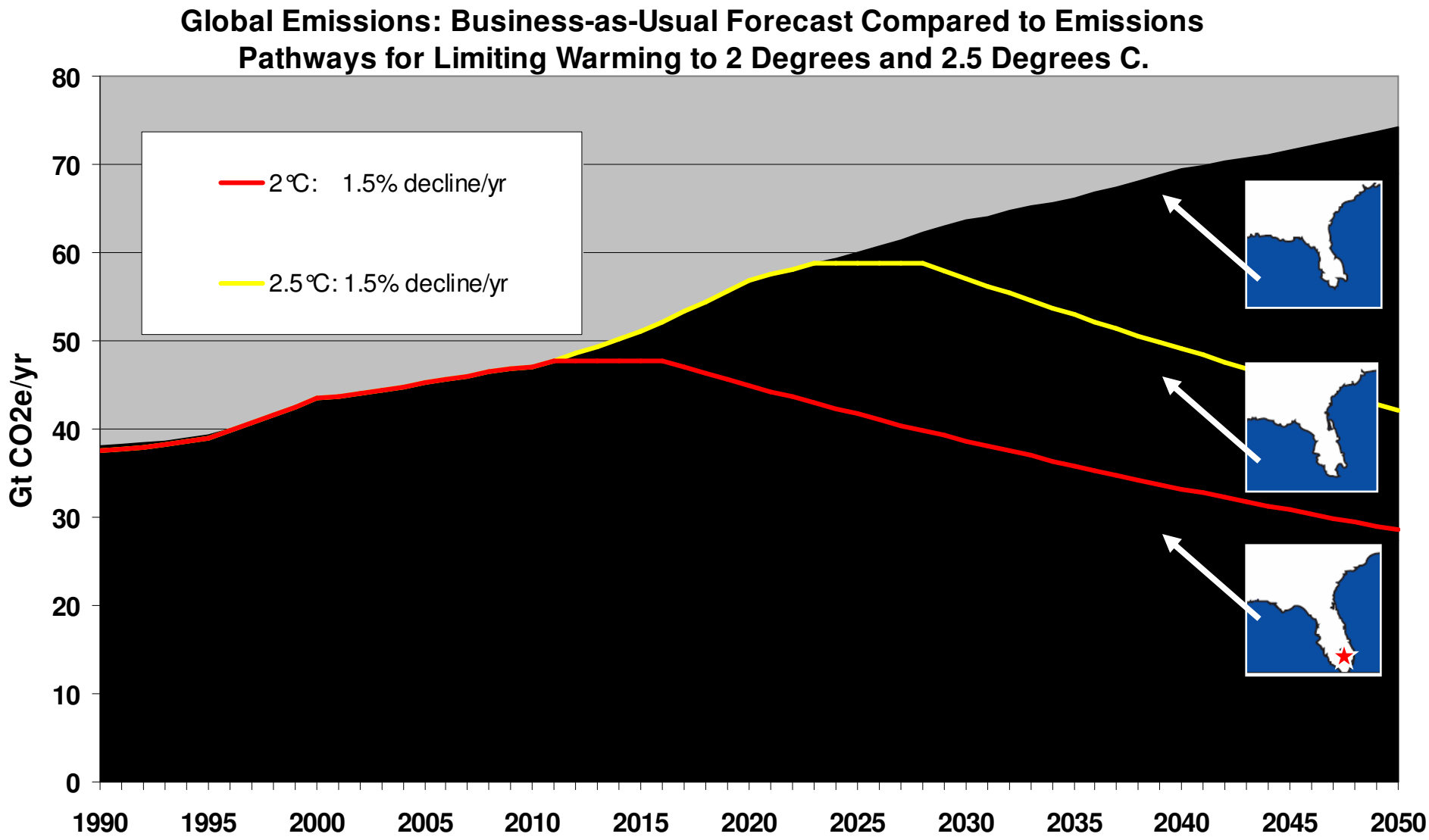
★ Miami

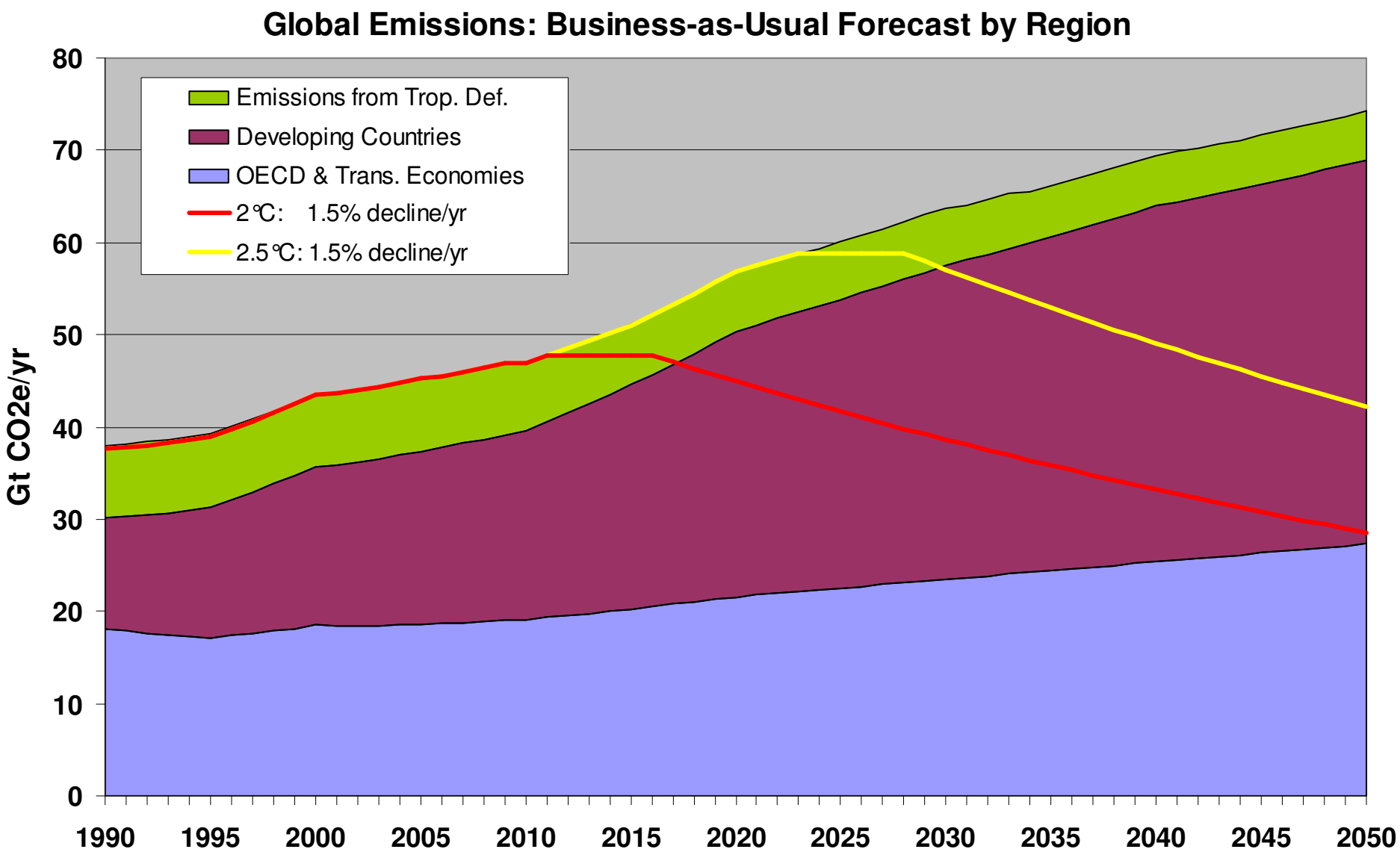
Courtesy of Byron R. Parizek, Ph.D., Pennsylvania State University

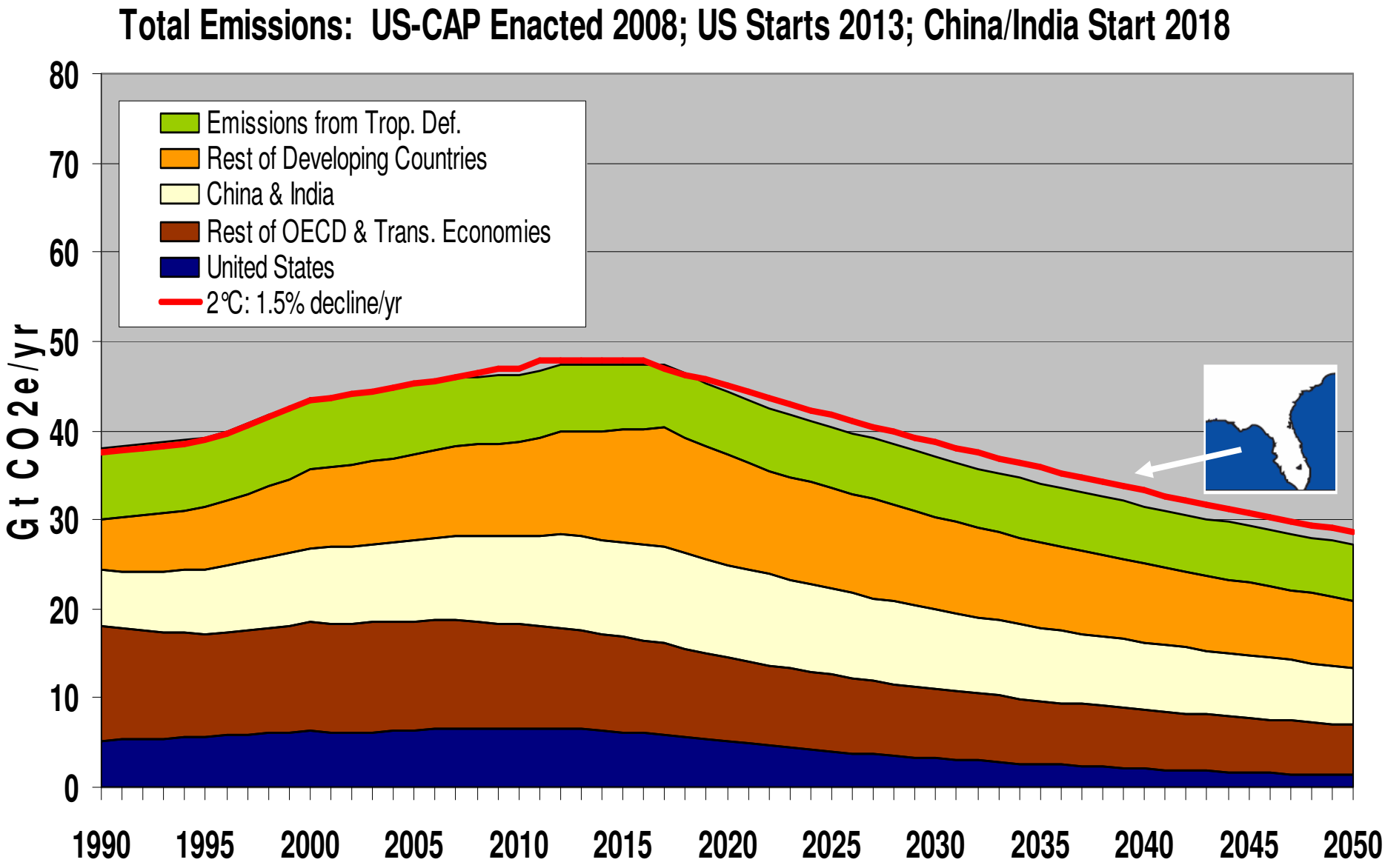
Table 2.1 Proposed numerical values of 'Dangerous Anthropogenic Interference'.

Vulnerability	Global Mean Limit	References
Shutdown of thermohaline circulation	3°C in 100 yr 700 ppm CO_2	O'Neill and Oppenheimer (2002) [44] Keller et al. (2004) [28]
Disintegration of West Antarctic Ice Sheet (WAIS)	2°C, 450 ppm CO_2 2–4°C, <550 ppm CO_2	O'Neill and Oppenheimer (2002) [44] Oppenheimer and Alley (2004, 2005) [45, 46]
Disintegration of Greenland ice sheet	1°C	Hansen (2004) [17]
Widespread bleaching of coral reefs	>1°C	Smith et al. (2001) [67] O'Neill and Oppenheimer (2002) [44]
Broad ecosystem impacts with limited adaptive capacity (many examples)	1–2°C	Leemans and Eickhout (2004) [30], Hare (2003) [19], Smith et al. (2001) [67]
Large increase of persons-at-risk of water shortage in vulnerable regions	450–650 ppm	Parry et al. (2001) [49]
Increasingly adverse impacts, most economic sectors	>3–4°C	Hitz and Smith (2004) [22]

Source: Oppenheimer and Petsonk, 2005 [47].


Global Emissions: Business-as-Usual Forecast Compared to Emissions Pathways for Limiting Warming to 2 Degrees and 2.5 Degrees C.
2℃: 1.5% decline/yr
2.5℃: 1.5% decline/yr
Gt CO2e/yr
0
10
20
30
40
50
60
70
80
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050


Global Emissions: Business-as-Usual Forecast by Region
Emissions from Trop. Def.
Developing Countries
OECD & Trans. Economies
2℃: 1.5% decline/yr
2.5℃: 1.5% decline/yr
Gt CO2e/yr
0
10
20
30
40
50
60
70
80
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050


Total Emissions: US-CAP Enacted 2008; US Starts 2013; China/India Start 2018
Emissions from Trop. Def.
Rest of Developing Countries
China & India
Rest of OECD & Trans. Economies
United States
2°C: 1.5% decline/yr
Gt CO2e/yr
0
10
20
30
40
50
60
70
80
1990
1995
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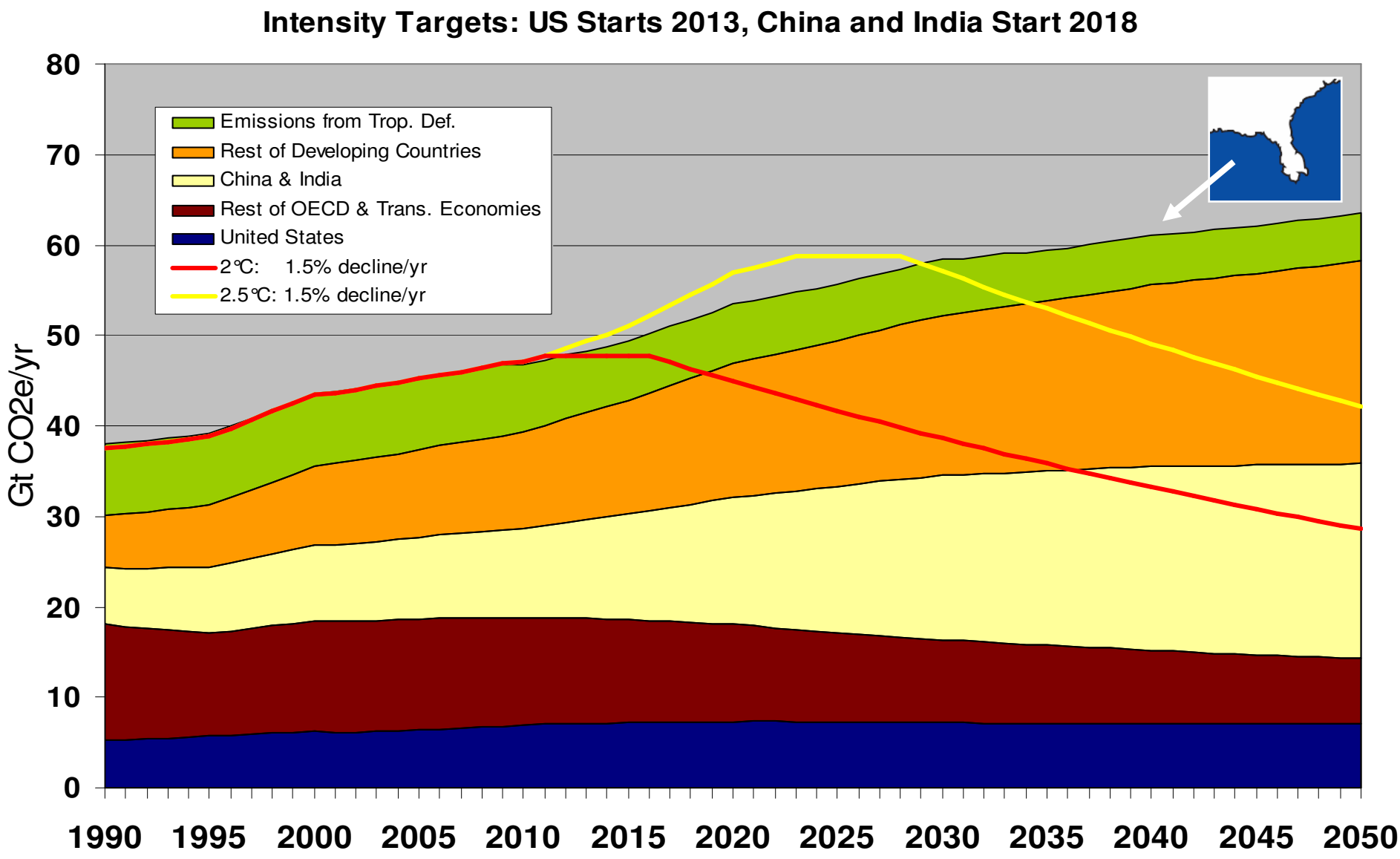
2050


Intensity Targets: US Starts 2013, China and India Start 2018
Emissions from Trop. Def.
Rest of Developing Countries
China & India
Rest of OECD & Trans. Economies
United States
2°C: 1.5% decline/yr
2.5°C: 1.5% decline/yr
Gt CO2e/yr
0
10
20
30
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60
70
80
1990
1995
2000
2005
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2015
2020
2025
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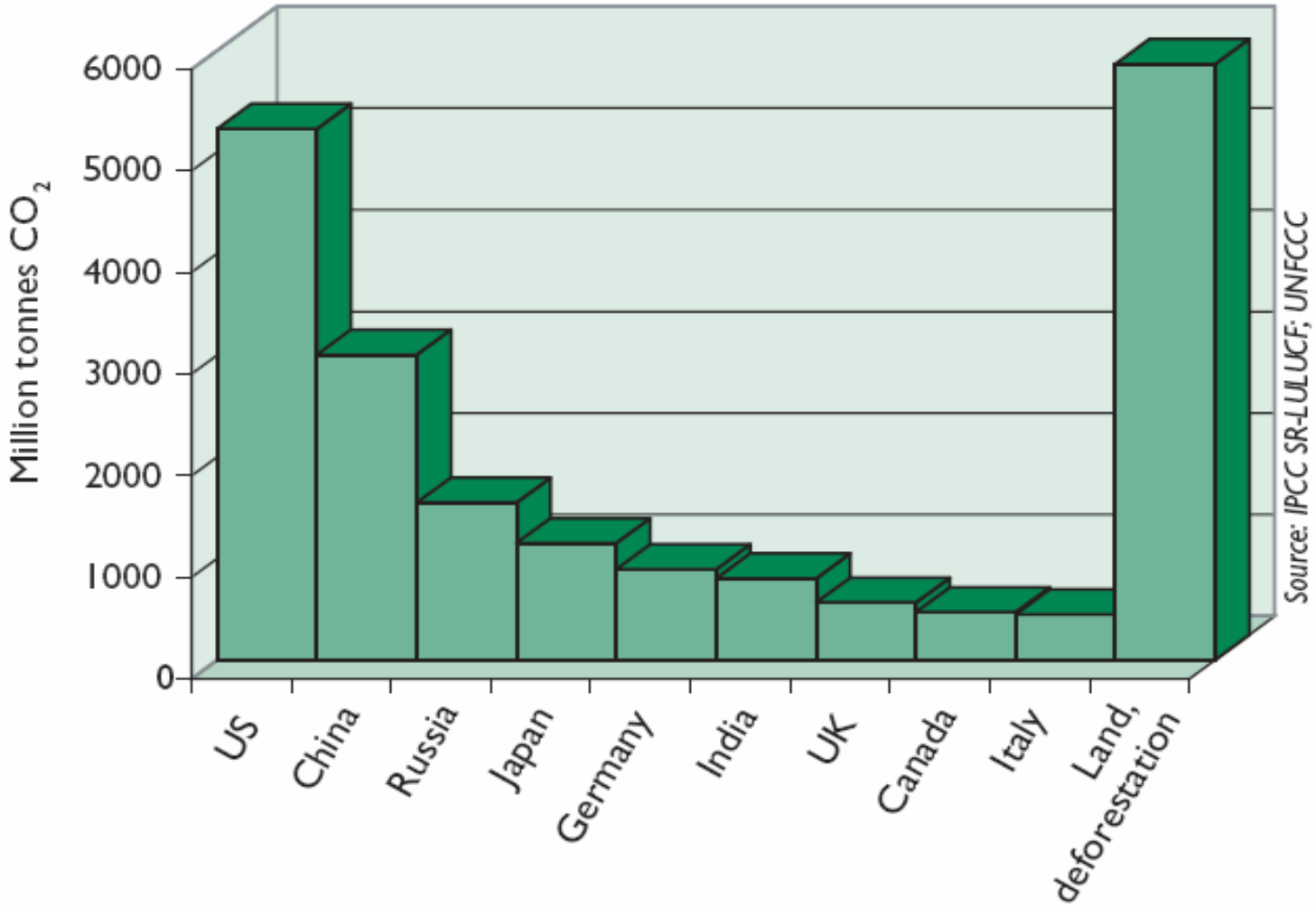
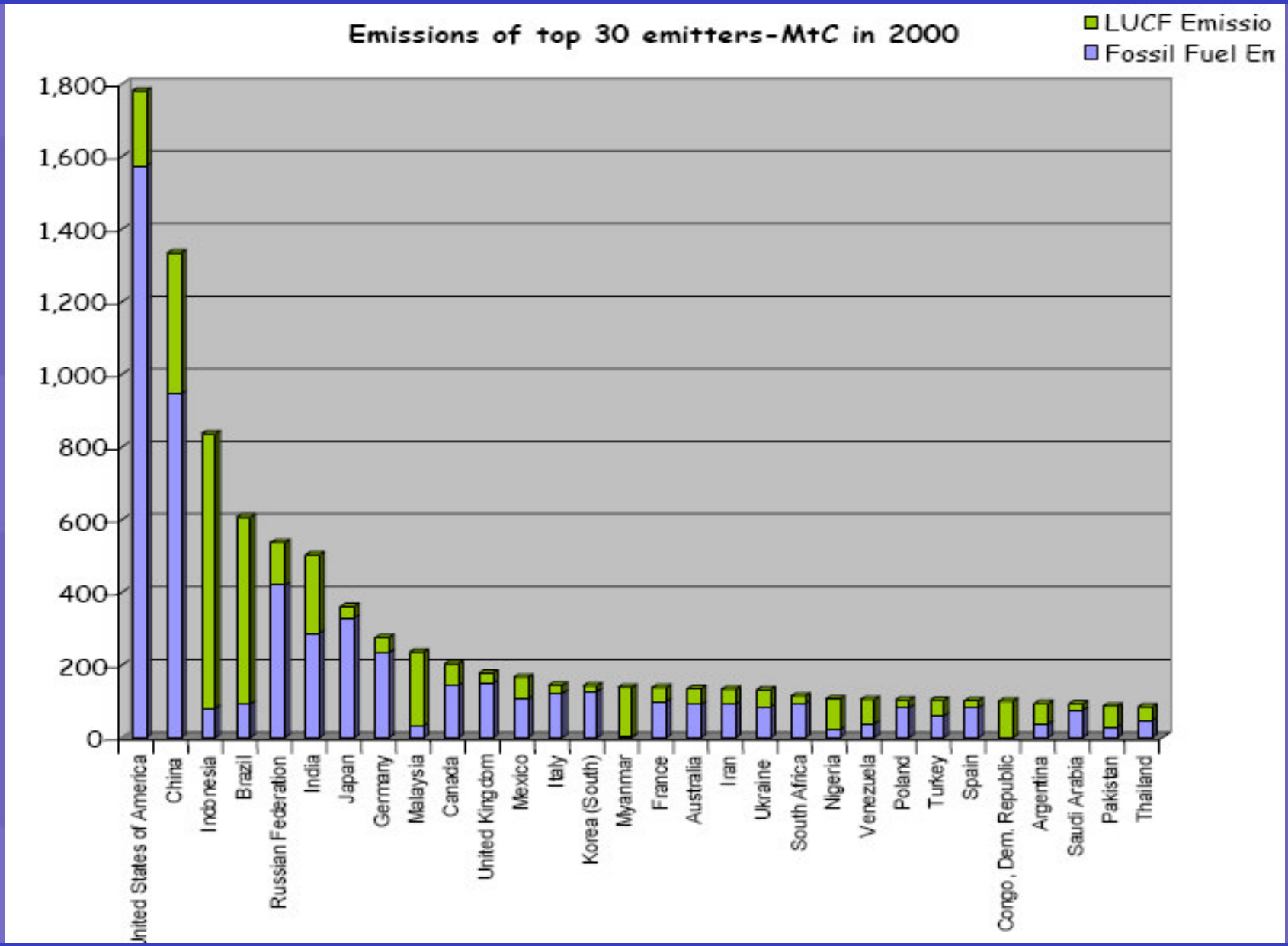
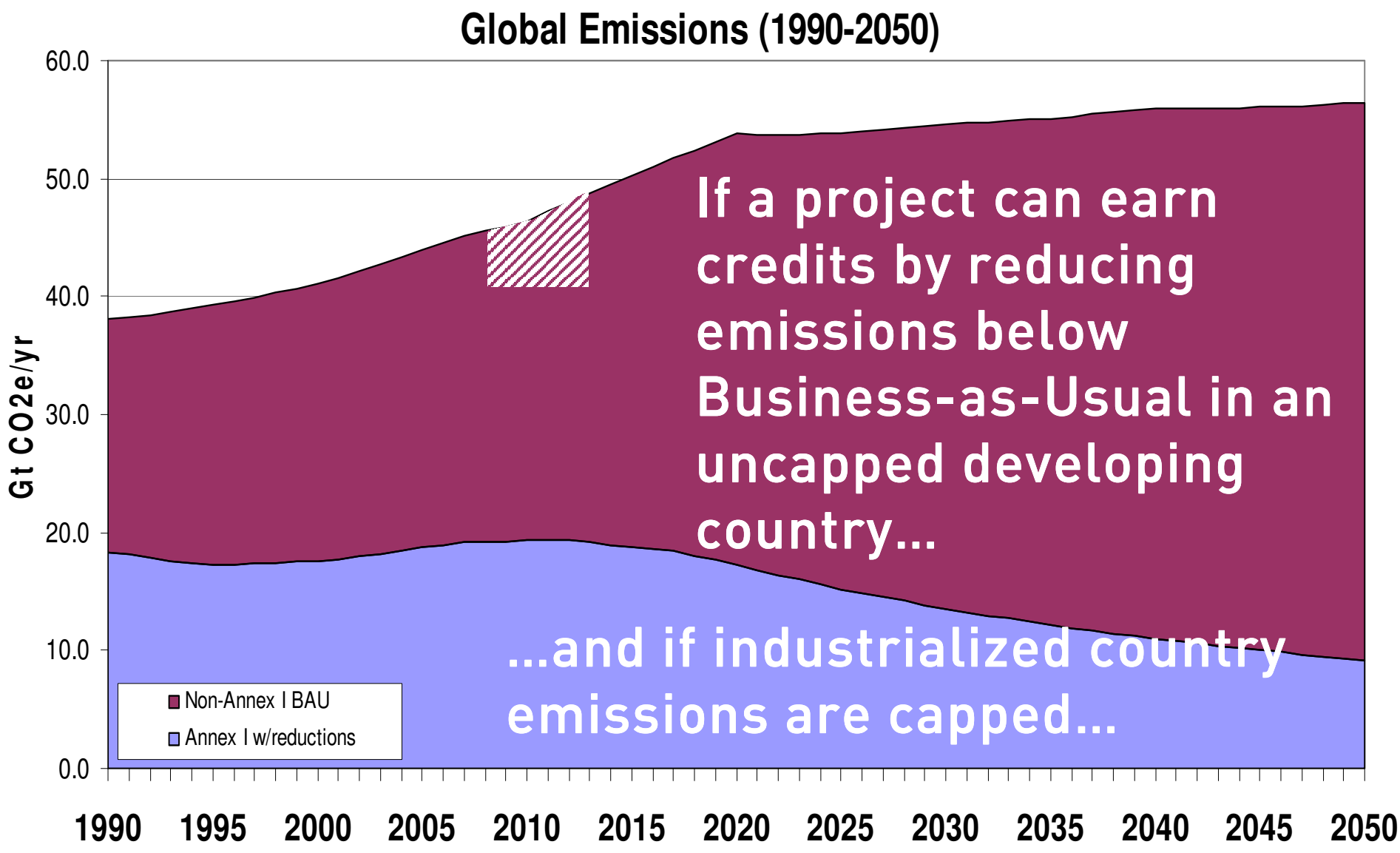
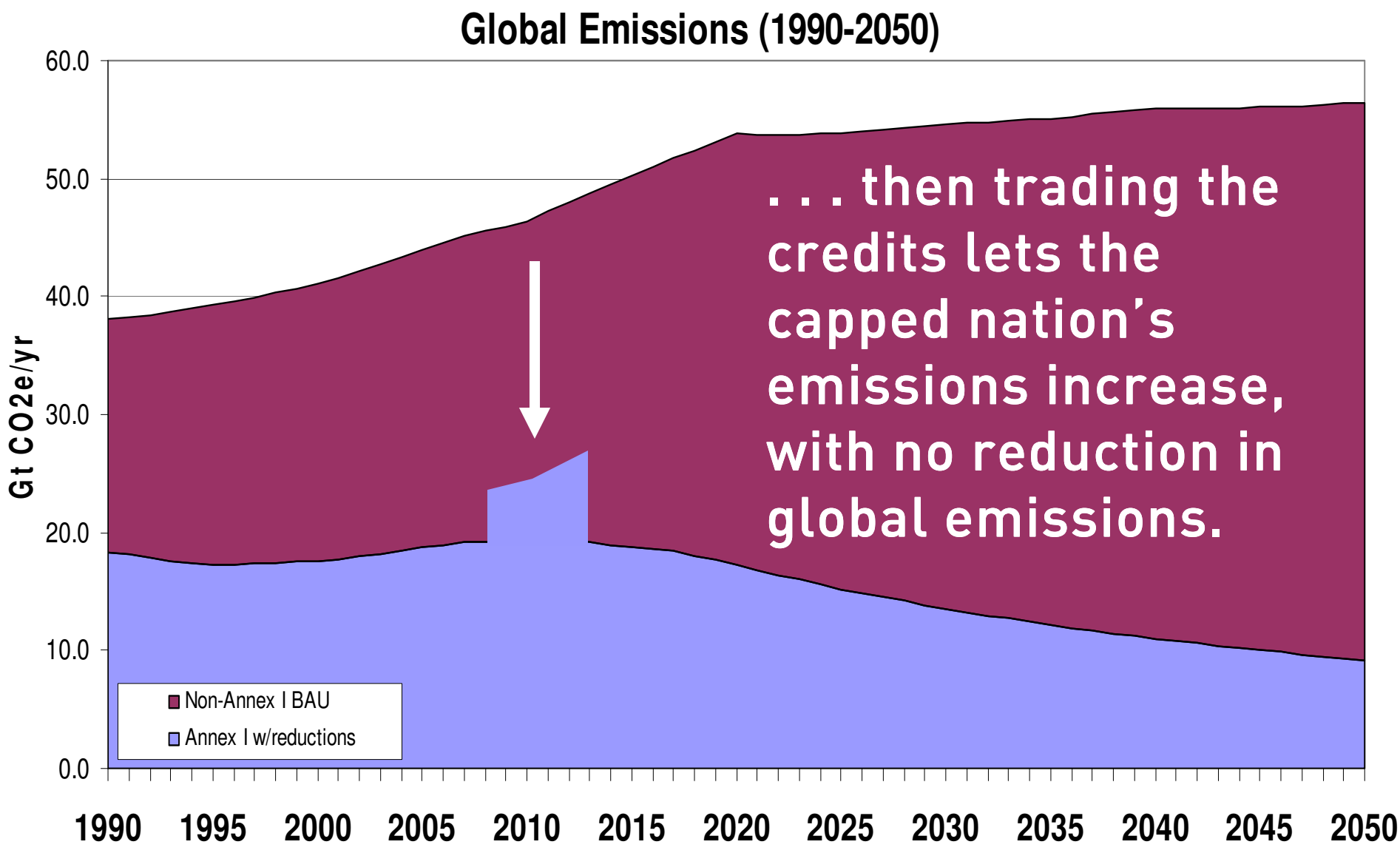
2040
2045
2050

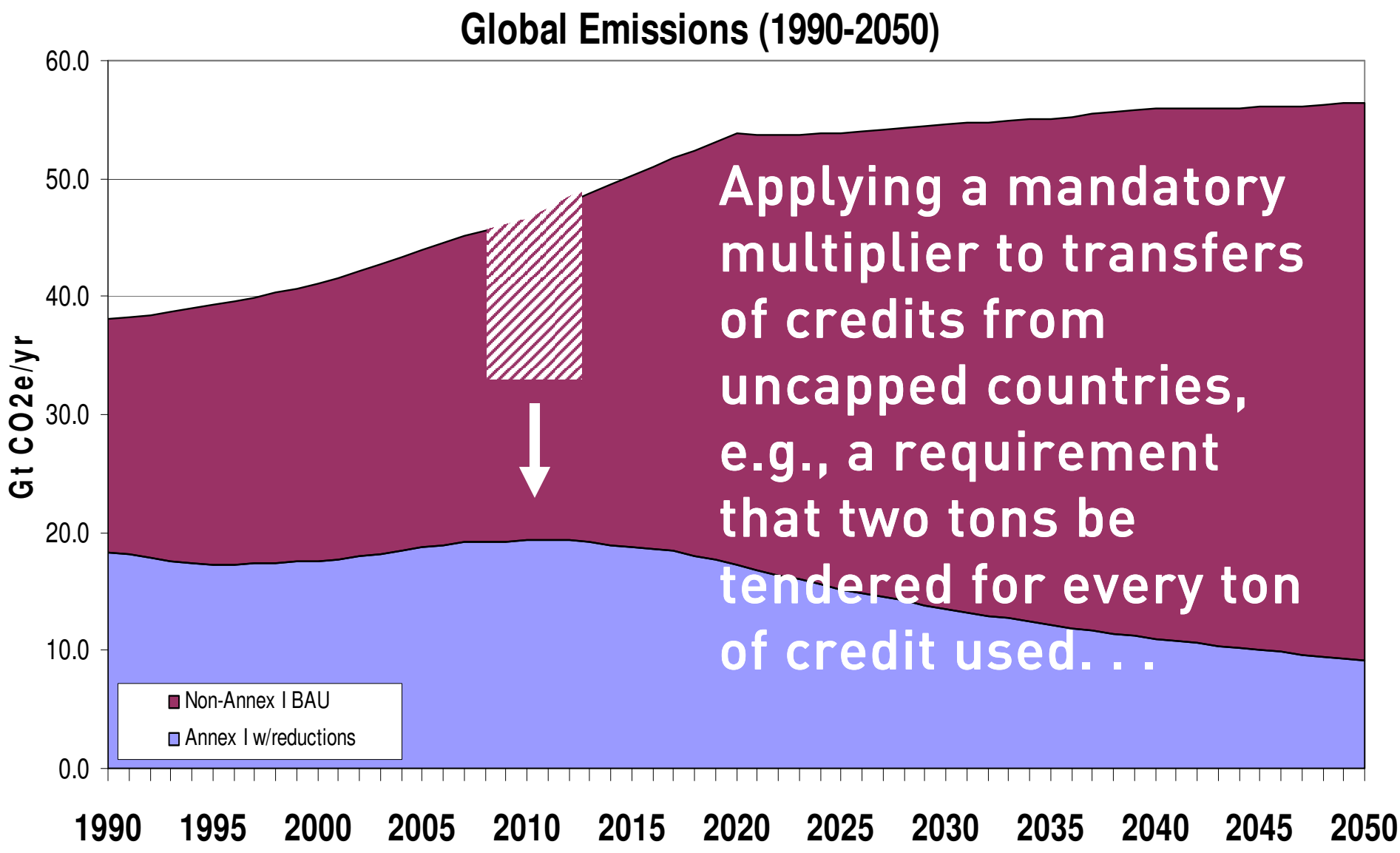
Comparison of mean annual deforestation emissions (1989–95) with fossil fuel emissions from selected countries (1995)

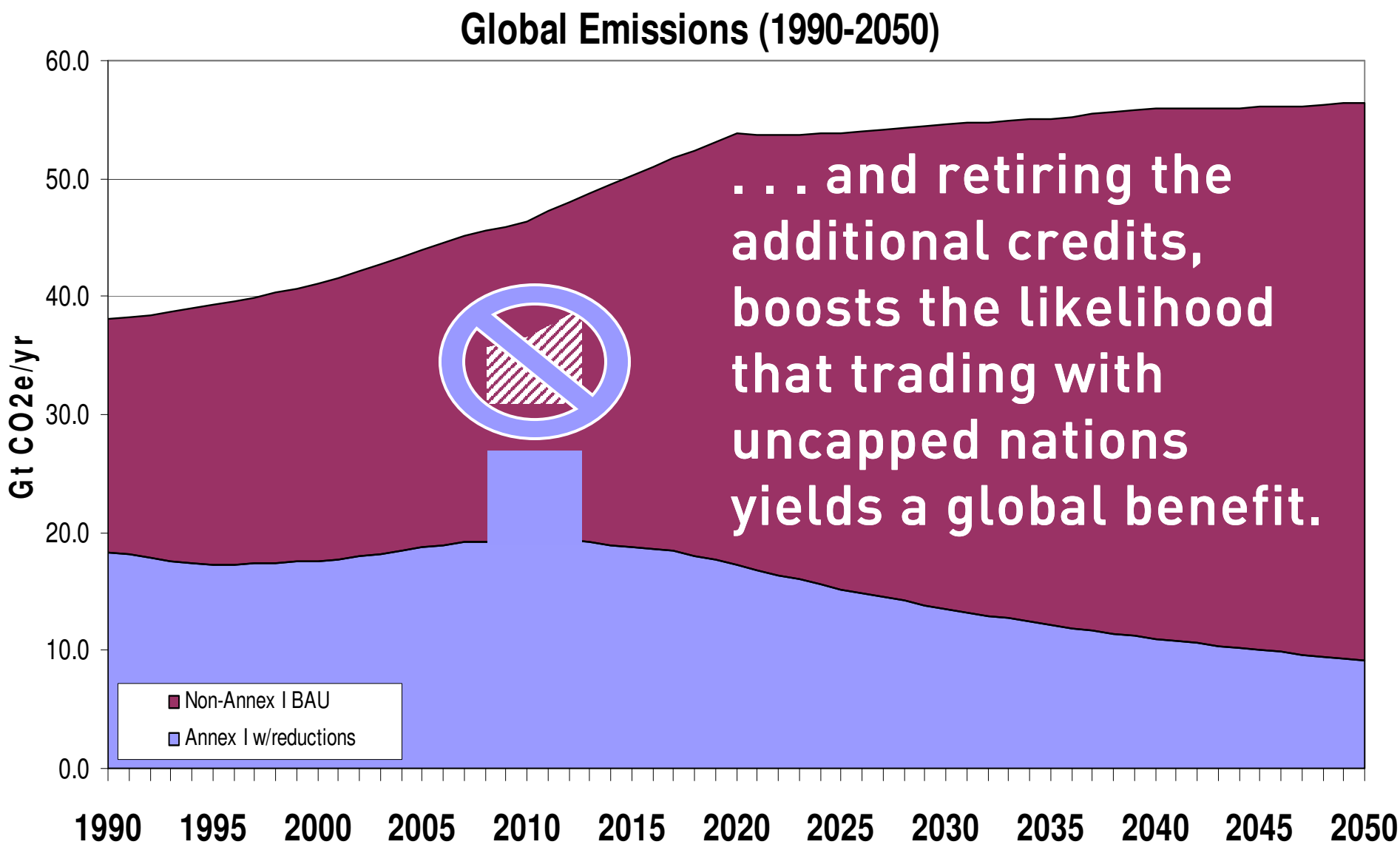



Emissions of top 30 emitters-MtC in 2000
LUCF Emissio
Fossil Fuel Em
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
United States of America
China
Indonesia
Brazil
Russian Federation
India
Japan
Germany
Malaysia
Canada
United Kingdom
Mexico
Italy
Korea (South)
Myanmar
France
Australia
Iran
Ukraine
South Africa
Nigeria
Venezuela
Poland
Turkey
Spain
Congo, Dem. Republic
Argentina
Saudi Arabia
Pakistan
Thailand


Global Emissions (1990-2050)
Gt CO2e/yr
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Non-Annex I BAU
Annex I w/reductions
If a project can earn credits by reducing emissions below Business-as-Usual in an uncapped developing country...
...and if industrialized country emissions are capped...

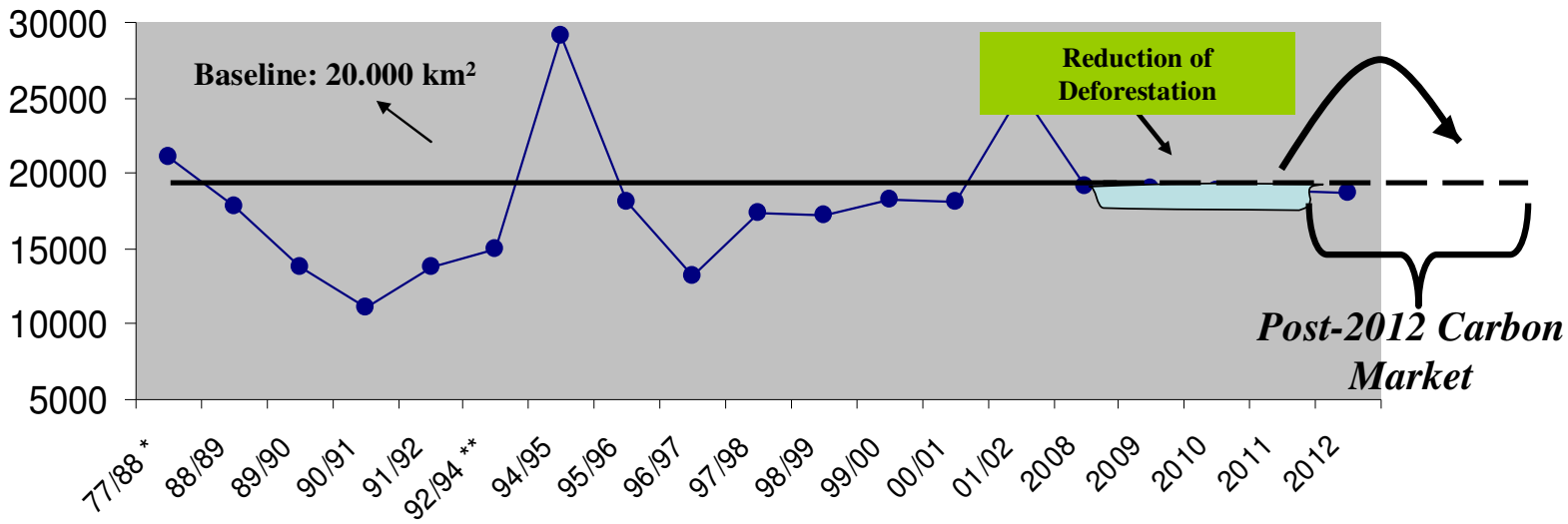

Global Emissions (1990-2050)
Gt CO2e/yr
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Non-Annex I BAU
Annex I w/reductions
. . . then trading the credits lets the capped nation's emissions increase, with no reduction in global emissions.


Global Emissions (1990-2050)
Gt CO2e/yr
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Non-Annex I BAU
Annex I w/reductions
Applying a mandatory multiplier to transfers of credits from uncapped countries, e.g., a requirement that two tons be tendered for every ton of credit used. . .


Global Emissions (1990-2050)
Gt CO2e/yr
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Non-Annex I BAU
Annex I w/reductions
. . . and retiring the additional credits, boosts the likelihood that trading with uncapped nations yields a global benefit.

Compensated Reduction of Deforestation:

Reductions 2008-2012 would be compensated in the Post- 2012 Carbon Market



Source: INPE 2003, IPAM

* Decade mean

** Biennium mean

% reduction of deforestation = ~ 5%

Avoided Emission: mean of 12 Million Tons C/yr

Reductions in deforestation 2008-2012 would be compensated in the post-2012 Carbon Market

Ref: Tropical Deforestation & Climate Change, Moutinho & Schwartzman, eds. (IPAM 2005)

EUA Forward 2013

€ 20/ton (3/07)

Fig. 3. EU ETS – Price and Volume
Source: Point Carbon 2007 (used by permission)