## Oil & Climate Change

# Global Warming Backgrounder

**By Tom Athanasiou**

First, and quickly, the basics:

Global Warming Itself

It would be good to be past today's well-financed "skepticism" about global warming, good if we all already understood that, in a world rife with potentially catastrophic threats—from nuclear war to genetic erosion—global warming is one of the most serious. Alas we are not. Alarmingly the skeptics (better called denialists) continue to derail the all-important political discussion of global warming by pretending that it's still an unproven theory.

This backgrounder, however, will ignore them.

It will also avoid any real introduction of the science of global warming. Such introductions take time, and they are already readily available. See for example the *excellent* graphic overview of global warming (but not its politics) which the UN Environment Program maintains at www.grida.no/climate/vital/.

Let's jump, instead, directly to the chase: the Earth's average temperature has already increased by about 0.6°C since the industrial revolution, when we first began burning fossil fuels in earnest, and in the process began spewing vast amounts of heat-trapping carbon dioxide, the principle greenhouse pollutant, into our common atmosphere. And this 0.6°C is just the beginning. The Earth's climate system, with its slow but inexorable carbon cycle, has a great deal of inertia, so far more warming is already "locked in." The challenge, now—and there is still time, but not much—is to stop the warming before it goes too far, to limit the rising concentration of greenhouse gases in the atmosphere before we reach what the UN Framework Convention of Climate Change (the UNFCCC, signed, by the way, by George Bush the Elder at the Earth Summit in 1992) calls "dangerous climate change."

What would be unambiguously "dangerous?" The emerging consensus, now prominent in both the scientific and activist literature, is 2°C, and it may be that even 2°C would be more than our bitterly divided and unstable society could tolerate. The debates here are both complex and fascinating, but suffice it to say that it's impossible to draw an absolute line. So much, after all, is indeterminate, so much already happening.

The details here—from the ongoing global drought to the dying corals—would take time to review. The easiest shortcut may simply be to look north, where the Arctic ice is rapidly melting, and where the most immediate danger seems to lie. For ice is of course highly reflective, and with the white north gone (think 2050!) the Earth would absorb more solar radiation, and thus global warming would accelerate. And if the Greenland ice sheet joins the adjacent polar ice in returning to water—and it may take only 1.6°C of warming for it to do so—the skeptics would be quite out of business, even in the United States. For unlike the polar ice, the Greenland ice is not already floating. It is on land, and if it melts, the resultant flow would raise the sea-level by several meters; the coastlines of America, and Europe, and Asia, and the whole world as we know it, would retreat before merciless waters.

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## The Kyoto Protocol:

The "climate talks" have two official faces: the Kyoto Protocol—which most newspaper-reading Americans know has been rudely rejected by the Bush administration—and the much less visible annual meetings, the "Conferences of the Parties," at which the critical negotiations take place. What most Americans do not know is that the overall legal framework here is set by the UNFCCC, and that it, rather than Kyoto, is the reason the negotiations have held together.

There's something else you must know about the UNFCCC—it divides the world's nations into two, establishing this division as one between "Annex 1" and "non-Annex 1" countries (the first are listed in an annex to the main treaty). In so doing, it reflects the historic division between "developed" and "developing" countries, though in an odd and imperfect way that reflects the political compromises that underlie the UNFCCC: Annex 1, for example, excludes, in spite of their wealth and high per capita emissions, the "Asian Tigers" and other relatively rich developing countries such as Israel and the Mid-East OPEC nations.

This division has had consequences. In the negotiations leading up to the Earth Summit, the European Union and many other countries favored the establishment of national "targets and timetables" for the reductions of greenhouse gases. But these national caps—quantified emission limits of exactly the type embodied in the subsequent Kyoto Protocol—were adamantly resisted by the U.S. and had to be thrown overboard. The result, which we've inherited, was a viable framework treaty (good), without teeth (bad).

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Soon, however, it became quite evident that, without targets and timetables, the Annex 1 countries' commitment to reduce their emissions back to 1990 levels by the year 2000 was largely symbolic. And with the scientific evidence for climate change becoming increasingly convincing, the need for binding targets had become clear. However, and herein lies the rub, the vast disparity in per-capita levels of greenhouse gas emissions (both historical and current) between the rich and poor countries meant that not all countries could be expected to take on targets. Thus, it was agreed, in a text called the "Berlin Mandate" at the first Conference of the Parties in 1995, that, initially, only the developed Annex I countries would have binding emission caps.

In the context of the climate negotiations, the Clinton administration had little choice but to agree to this. But at home in the U.S., where public knowledge of climate change was minimal, the fossil-fuel industry mounted a campaign to portray this mandate as "unfair" to the U.S. because it would have to pay to reduce emissions while large developing countries like India and China would not. In 1997, with the Kyoto negotiations on the horizon and the environmental community unable to effectively counter this message, the Senate voted 95-0 (the Byrd-Hagel Resolution) to assert that it would accept no treaty that did not also contain binding targets for the developing countries. In so doing, it effectively repudiated the Berlin Mandate and set the stage for an ongoing crisis in the negotiations, a crisis that is now coming to a head.

The U.S. response was twofold. First, Clinton and Gore lobbied hard for the inclusion in the Kyoto Protocol of "flexibility mechanisms" which would allow Annex 1 countries to reduce the cost of their emissions reductions. These include both Kyoto's emission trading provisions, which allow high-emitting countries like the U.S. to buy emissions credits from countries with surplus allowances, and the Clean Development Mechanism, by which Annex 1 countries can invest in and obtain "credits" for carbon reduction projects hosted in non-Annex 1 countries. Both of these, by the way, are very long stories indeed. Second, once Kyoto was negotiated, Clinton never submitted it for ratification to the Senate, where, of course, it would have been promptly rejected.

By the rules of the Protocol, it only "enters into force" after it is ratified by at least 55 countries, including enough Annex 1 countries to account for 55% of combined 1990 Annex 1 emissions. With the U.S. rejection of the Protocol and its subsequent rejection by Australia, the only way this was possible was if all other Annex 1 countries ratified. Europe, Japan, and (somewhat surprisingly) Canada all did in fact do so, and the only country whose ratification is still required is Russia. However, knowing that they have effective veto power over the treaty, the Russians have been playing hard to get, and there are evidently both con-

flicts in Russia over ratification and covert efforts by the U.S. to persuade them not to.

Today, after the ninth Conference of Parties in Milan, there's still widespread belief among climate experts that Russia will in fact ratify the Kyoto Protocol and that it will enter into force in the next year or so. Further, much of the climate community's effort is now going into debates over "next steps," over how to structure a post-Kyoto agreement that includes both developed and developing countries. This is an extremely important problem, and the debate is fascinating indeed, but progress has been made extremely difficult by the fact that the U.S., the world's largest polluter by far, has rejected Kyoto and is not taking any significant action to reduce its emissions. Given this, the developing countries have refused to even discuss taking on quantified emissions targets similar to those of Annex 1 countries.

Damaged grain bins and sand-covered cropland caused by a Missouri River flood (no date available). Source: Environmental Protection Agency.

It's widely recognized that a real solution to the climate problem will require that developing as well as developed countries reduce their emissions well below current per capita levels. It's a monumental challenge, and with the Bush administration unwilling to engage, it is not clear how it can even be approached.

## Drilling Deeper

While the U.S. has been the center of resistance, the real enemy is larger, more diffuse, and more terrifying than even the Bush administration. It needs a name and "the carbon cartel," though not ideal (it seems to imply an active, centralized conspiracy, when in fact it is far more) will do. The term, in any case, is useful to name the corporations, states, elites, institutions, and capital that are bound up with the logic and interests of not just oil, but the whole fossil sector.

Global warming may soon be the greatest challenge our species has ever faced. So far, unfortunately, this is not widely understood in either the U.S. (where the denialists are in power, and their allies control most of the media) or in the South (where the elites still generally consider global warming to be only a long-term problem). Nevertheless, the reality is slowly becoming clear: to the Europeans, who've just suffered a wave of killing weather, to the increasingly anxious scientists who, staring into their data sheets and simulations, are seeing a terrifying picture begin to clearly emerge, and to the activist community, which is finally finding its own way to the challenges of global warming.

These challenges are manifold, though for the purposes of simplicity, let's just say that we desperately need a crash global clean-energy transition, and, indeed, "just and sustainable development." Unfortunately, both remain largely rhetoric and dreams. And let's add that, for the most part, and particularly in the South, the term "development" still conjures images of development-as-usual. And that this will no longer do.

It isn't going to be easy to clear this up. The rich, after all, did not become so by developing "sustainably." And development, or at any rate poverty reduction, from which it still derives its legitimacy, remains the top priority of the South. Consider that, according to a recent report from the London School of Hygiene and Tropical Medicine, the greenhouse body count has already reached 160,000 deaths a year. (The majority of these occur in Africa, Southeast Asia, and Latin America, where people are highly vulnerable to malnu-

trition, malaria, and diarrhea as hotter temperatures settle in and floods and droughts become more common.) It may seem a huge number, but to put it in perspective, note that the World Health Organization estimates that indoor air pollution alone causes 1.6 million deaths per year. That's an even power of ten greater than the greenhouse body count, and in this case the killer is poverty pure and simple. Poverty, and with it murderously obsolete heating and cooking technologies.

Against such a background, it's easy to understand why the global justice movement has been so long in taking the climate negotiations seriously. It's also easy to understand why this is finally changing. For one thing, the "impacts" of the warming are becoming severe—the global drought, increasing desertification, the heat-waves, the melting Arctic ice, the rising water; they add up to a drumbeat that's hard to ignore. For another, in the face of a cruel ecology that promises to concentrate the "impacts" of the warming in the developing world, it's become far more difficult to cast environmentalism as a rich world pastime.

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The problem is that, at the moment, it is only the climate problem, and not the climate negotiations, that the global justice folks seem to appreciate. Sometimes, in fact, it seems as if the "radicals" among us consider the Kyoto Protocol, or at least its emission trading provisions, to be products of the same mentality that brought us the slave trade and the WTO.

Let me be clear: the notion, common among anti-globalization folk, that the climate talks are a compromised process in which liberal NGOs have lost their way in UN corridors crowded with emissions traders, is not without its element of truth. But the climate treaty is far larger than emissions trading and its discontents. Sitting within the halls of a UN climate conference, the people in the NGO bloc, and many others besides, look forward to protests occurring outside. The general rule: May they be large and bracing. May they bring focus and lucidity. May they, above all else, be helpful.

And the Kyoto Protocol, even if the carbon cartel manages to kill it, must be seen as the first halting step in the construction of the most significant environmental and economic treaty of all time. Because as the climate regime becomes, as it must, a global regime, it will also become quite impossible for the global justice movement to proceed as if the greenhouse crisis and the climate treaty are of merely secondary importance.

The challenge, now, is to find a way beyond the Kyoto Protocol, a way, eventually, to incorporate both the developing world and the U.S. into an effective and politically acceptable international climate regime. In this regard, two bits of jargon, "adequacy" and "equity," must be understood, for between them they define and contain the heart of the problem.

"Adequacy," in the dialects of the climate world, means facing the challenge of preventing a dangerous degree of global warming. It means that, whatever the science tells us, we cannot deny it, not even if we think that the political and social changes that will thereby be needed to stabilize the climate are "unrealistic." It means that, even though a large amount of warming is already locked in, we must at all costs avoid crossing the line into a world in which the "impacts" of global warming are no longer "tolerable."

"Equity," of course, means justice. It means "just transitions," in that the *rich must pay* to help impacted and vulnerable communities "adapt" to the impacts and changes that will soon be upon us (think flooded villages in the global South, or coal miners here in the U.S.). It means that those who are the most responsible for the warming—and this means, again, the rich—must pay to "mitigate" the emissions that cause the warming. And it means that, in a world where the oceans and the skies are clearly revealed as fragile and finite, that these "environmental spaces" must be fairly shared by all and protected as a global public good. It means that emission rights must ultimately be apportioned on the basis of equal per-capita rights.

## The Transition is Going to be Difficult

The science of global warming is complex, but here are two essential concepts:

The Tolerable Transition Corridor: We once called this the "soft landing corridor," but in fact it's not, not really. Even if we make it into this corridor, and then manage to arrive in a new world where the threat of global warming has receded from view, we, and especially the poor and vulnerable among us, will suffer greatly. The landing will not be "soft."

Follow the emerging scientific consensus and think in terms of 2°C of warming as the tolerable maximum. What would this mean, in terms of impacts? Well, if the scientific assessments are correct, 2°C degrees would severely impact the vast majority of the earth's population. Consider only the oceans: It would drive coral reefs to the edge of extinction, inundate entire island countries in the Pacific and Indian Oceans, cause untold damage and suffering in the many areas with low lying coastal populations. And that's just for starters. The darker possibilities, as noted above, are dark indeed.

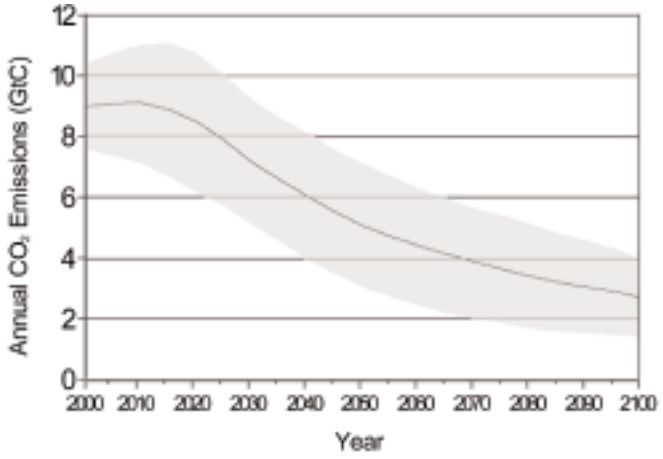
How can we "tolerate" such a warming? We should not want to, but the situation demands realism. And we are in fact advocating 2°C only as a maximum that we should strain to achieve, but which, in practice, we may not be able to avoid overshooting. What we actually advocate, in other words, is an all-out global effort to keep the warming from rising higher than 2°C degrees, where the really scary stuff starts to become likely.

In any case, note that targets above 2°C are often cited in the economics literature, without formal justification, as "safe". It is, in fact, clear that they are not. It is also clear that the victims of the warming will not find it as "tolerable" as those who, protected by geography and wealth, are able to isolate themselves from its impacts.

The Climate Sensitivity Factor: The exact value of the "climate sensitivity factor," a scientific index designed to specify how much warming will be caused by a doubling of the atmospheric carbon concentration, is probably the most important remaining scientific uncertainty. But contrary to the denialists, the uncertainty is not likely to resolve itself in our favor. In fact, it now looks like it will come in far above the Intergovernmental Panel on Climate Change classic "best estimate" of 2.5ºC. What this means is that it's going to be tough, very tough, to hold the warming to 2°C.

This is complex, but a picture might help:

Looking at this figure, keep in mind that it's quite optimistic about the climate sensitivity. There are three emissions paths here, with the area between the highest and lowest shaded to reveal a 450 parts-per-million




A 450-ppm stabilization corridor, one that now looks quite optimistic. Note that the width of the corridor reflects uncertainty about the global carbon cycle. Adapted from the IPCC's Third Assessment Report, 2001.

carbon stabilization corridor. This, if we're very lucky indeed, will allow us to avoid a warming of over 2°C. Focus on the areas under the curves. It's these that show, for each of the three cases, what the allowable cumulative global emissions would be over the next hundred years. *Note that even if we follow the highest and most permissive path, global carbon emissions must peak in less than twenty years, and then head sharply down*. And, to err on the precautionary side, we shouldn't just look at the top curve. If the low-emissions path turns out to better describe the carbon cycle's behavior, then there's a whole lot less atmospheric space to go around. Indeed, we may already be overshooting the 450-ppm path, since global emissions are continuing to rise, rather than falling, as the lower path dictates.

There is, in other words, still time, but not much. Under any circumstances, global greenhouse gas emissions—including the increasing emissions of the developing world—really do have to peak soon, and then

start declining fast if we're going to hold the 2°C line. Even if things go well—and it's not obvious that they will—we're only going to be able to make it into the tolerable-transition corridor if we really try. And if we're lucky: if the climate sensitivity factor turns out to be high, we're only going to be able to make it by way of a transition in which global emissions *overshoot* the level that would cause 2°C of warming and then drop along a real roller-coaster curve.

In all honesty, making it onto such a roller-coaster, and then surviving it, is the real challenge of global warming. Because what it demands, to turn from this crash-review of the science to the real world of development and politics, is that the "decarbonization" of the economy becomes a massively faster process than it is today. And this in turn means that the development of the South has to become clean-energy development above all else.

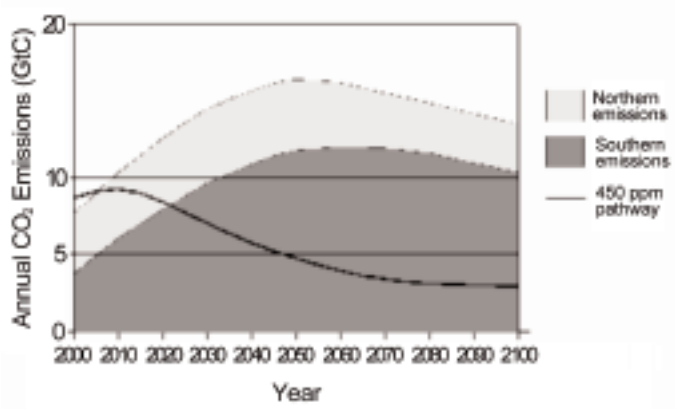
This isn't going to happen without an equally rapid and compelling drive for decarbonization in the rich, already developed world, a decarbonization on the order of an 80% decline in carbon emissions in the small space of the next 50 years. And this, to return to our opening frame, means that the challenge of global warming is very much the challenge of isolating and defeating the carbon cartel.

## Fossil Fuels, Climate, Political Reality

Oil is not the only problem, in terms of climate. Campaigns like "No New Oil" might, to be sure, be both evocative and politically useful, but if you look to where the carbon is, it's quite clear that coal is the real climate time bomb. Moreover, while oil defines the current military and economic flashpoint, this is in part because there is good reason to think that oil supplies are peaking. Coal reserves, on the other hand, are absolutely huge—China alone has reserves quite large enough to burn us all into climate hell—and coal is clearly the central issue when it comes to energy sector modernization in the developing world. If the next few decades see coal emerge as the basis of that modernization, we're in real trouble.

The core of the climate problem, in any case, is that the fossil fuels are deeply built into the infrastructure and history of "development" as we know it. The problem of rapid decarbonization is, to large degree, a problem of finding a development path in which China, the other "Big Poor" countries, and the South in general turn rapidly away from fossil fuels rather than vainly attempting to follow the North down a path that simply cannot be replicated.

This may seem a bold claim. It may even seem that we are unfairly focusing on the South. But take a look at this:




Annual $CO_2$ emissions North and South under IPCC's A1B scenario, plotted against a midrange 450-ppm stabilization pathway. Data from the 1999's Special Report on Emissions Scenarios.

What this figure shows is a pessimistic, but plausible, "business as usual" scenario in which the projected growth path of carbon dioxide emissions is divided into North and South, with global emissions (the sum of North and South) tracking the top of the lighter shaded area. It's probably not going to happen, but it could, and to see what it would mean, compare the projected emissions to the overlaid, medium-case (450-ppm), now optimistic, "tolerable transition" pathway.

What these curves show is that global emissions crack through the 450-ppm path by about 2005, and that *Southern emissions alone* (the top edge of the darker shaded area) exceed that path by about 2020. What it doesn't show is that the more global emissions increase above the 450 path, the faster and farther they'll have to fall to return to it, and that if they follow the A1B trajectory, we can a expect a catastrophic temperature change upwards of 4°C.

Or put it another way: The North could meet its Kyoto targets, and, the warming would still reach extremely dangerous levels unless the curve of Southern emissions also bends down, sharply, and

soon. But why—think "real world" here—would the South struggle to make such a turn unless the critically limited global emissions budget was being fairly divided between it and the North?

It would not.

The South is torn by conflicting forces. In the environmental ministries, the realities are being recognized; witness China's recent adoption of automobile fuel efficiency standards far tougher than anything possible in today's U.S. But change is slow, and in the energy ministries and indeed most governmental mainstreams, it sometimes seems to have penetrated not at all. Given this, and given the larger situation, we all—North and South—need a strategy by which strong climate policies can be forged into instruments of just and sustainable economic and social development.

This lake near San Luis Obispo, California barely contains any water following a several year. drought. Source: Environmental Protection Agency, 1991

But it isn't going to be easy to contrive such a strategy, for it is, ultimately, up against the dismal realities of an international economic and political system, which does not favor genuine development of any kind. Leave aside the crashing wave of neoliberal integration that followed the collapse of the Soviet bloc, and the trade and aid politics of the North, both of which actively encourage carbon-intensive growth. Consider only that "creative destruction" is perhaps the most remarkable and enduring feature of capitalist development, and that the South, weak within global tides, is most easily swamped. You'll see why Southern countries cannot be expected to pursue dreams.

Now the international climate debate is turning from the Kyoto Protocol to the "next steps" that must follow it, steps that must be planned even as the United States (which one wag of a climate negotiator recently referred to as "25% of the world's emissions") is working actively to destroy the negotiations. In this context, where China, and India, and Russia, and even the U.S. must be brought into the fold, nothing is clear. Nothing, perhaps, but the certainty that the South will play its cards as best it can.

What will happen? We do not know. The South, after all, has its full complement of madmen and fools. As does the North. We've no choice but to move forward as best we can. For while the South must develop along a low-carbon trajectory, today's global institutions, all of them controlled by the North, continue to force it into paths of fossil-fuel dependency and desperate, export-led industrialization. This will clearly have to change, and until it does, Southern elites will find it remarkably easy to treat the North's interest in global warming as a scheme designed to suppress their development. Hypocrisy breeds more hypocrisy, and Southern development, after all, is being suppressed. To see this, you need only study the trade regime.

Still, we are not slaves of history. And, thus, a question: Could a visionary climate plan, anchored in an alliance between the Europeans and the South, shift the field? Yes it could. If the environmental movement, North and South, stood together for a just climate regime designed to ensure Southern development (the real thing this time), it would become far more difficult for bad actors, Northern or Southern, to play their games of divide and conquer. If climate protection became a drive for genuine sustainable development, then even self-interested Southern elites would develop a keen interest in it,as they experience real and tangible benefits in ecologically sound trade and investment.

What would a "just and adequate" climate regime look like? A big question, but it is possible, at the risk of oversimplification, to sketch some of its key features.

It would have to take the worsening science seriously. To that end, it would have to define, and continuously recalibrate, a global "emissions budget." And we would, all of us together, North and South, have to stay within it.

This limited budget would have to be *allocated fairly*, which of necessity means equal per capita emissions rights. Such rights would, in practice, have to be temporarily modified by national circumstances—for example, some countries, like South Africa, have inherited terribly inefficient energy systems—but in the end, nothing but equal human rights to the atmospheric commons makes any sense.

The climate regime would have to ensure a *just transition* for impacted communities—within nations and, even more difficultly, at the global level. If such communities are not somehow "made whole," the transition would be resisted, and justly so. It would then drag, and then fail.

The climate regime would have to ensure a quick transition from fossil to renewable energy. *Decarbonization*, in the current jargon, would have to be both rapid and fundamental. This means, of course, that the climate regime would have to be seen as part of a broader strategy to isolate and defeat the carbon cartel.

Finally, a just and adequate climate regime would have to offer the South a real development strategy, one that Southern leaders can honestly believe will find traction even in a world dominated by corporated driven globalization.

There's more to add, of course, but this will have to do. The good news, in any case, is that the writing is now clearly on the wall, and that plenty of people are reading it.

Which brings us, by way of conclusion, to the pivot of the climate challenge: if we are going to make it into a tolerable transition corridor, we're going to have to have both justice and realism on our side. And this is very much not the way it usually goes. Today, indeed, "realism" connotes nothing so much as the rule of a narrowly conceived national self-interest, as if, in practice, the really important part of politics was not the redefinition of self interest in new terms.

Those new terms, today, must be fundamentally just.

The challenge, in other words, is to find a new realism, a geoecological realism in which equity, and, specifically, distributional justice is affirmed as a foundational political principle. And here's the twist: This "moral vision" is itself part of the game, and a powerful political force. The way forward, in other words, lies in taking "the just" and "the realistic" as two sides of one single overarching imperative, two sides of one integrated vision.

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It's a vision that we're going to need if we're going to get out of here.

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