GREEN WORLD AND GLOBAL WARMING.

As the world looks around anxiously for an alternative to oil, energy sources such as biofuels, solar, and nuclear seem like they could be the magic ticket but in fact, they're not.

Greening the world will certainly eliminate some of the most serious risks we face, but it will also create new ones. A move to electric cars, for example, could set off a competition for lithium, another limited, geographically concentrated resource.
In Asia, Europe, and the United States, people are getting excited about the electric car, and for good reason. Electric cars will enable greater independence from oil and could play a significant role in lowering carbon dioxide emissions. But the major fly in the ointment for the electric car is the battery.
Many solutions are being considered, including air batteries that produce electricity from the direct reaction of lithium metal with oxygen. The most likely option for now, though, is the lithium-ion battery used in cameras, computers, and cellphones. Lithium-ion batteries offer better storage and longer life than the older nickel-metal hydride models, making them ideal for a space-constrained, long-running vehicle. This entire means that lithium is likely to be a hot commodity in the years immediately ahead.
It so happens that about three quarters of the world's known lithium reserves are concentrated in the southern cone of Latin America-to be precise, in the Atacama Desert, which is shared by two countries: Chile and Bolivia. Other than these reserves and the Spanish language, the one thing these two countries have in common is a historical animosity, cemented by their late 19th-century War of the Pacific. Chile was able to cut off Bolivia's access to the sea, a maneuver that rankles bitterly in La Paz to this day.
Bolivia's lack of coastline could become an issue again if the two lithium powerhouses start jostling to attract investors. Competition between Bolivian and Chilean lithium mines and, potentially, over domestic production of lithium batteries could very well bring about a second War of the Pacific, to say nothing of the huge environmental costs that lithium mining incurs. Any such tension could jeopardize U.S. efforts to adopt electric vehicles, as the United States already gets 61 percent of its lithium imports from Chile.
China and Russia, which also hold significant reserves, would be poised to ride out and profit from such an event. Further, conflict between the two Latin American states would likely bolster the fortunes of batteries made from less efficient resources, such as those used in nickel-metal hydride batteries, or boost other technologies that use different substances with their own drawbacks. And in any event, the possibility of a regional lithium rush reminds us that whatever technologies take hold, demand will emerge for the scarce commodities on which they depend and we know well where that can lead.

The sheer amount of water needed to create some kinds of alternative energy could suck certain regions dry, upping the odds of resource-based conflict. And as the world builds scores more emissions-free nuclear power plants, the risk that terrorists get their hands on dangerous atomic materials, or that states launch nuclear-weapons programs goes up.
The decades-long oil wars might be coming to an end as black gold says its long, long goodbye, but there will be new types of conflicts, controversies, and unwelcome surprises in our future, including perhaps a last wave of oil wars as some of the more fragile petro-states decline.
If anything, a look over the horizon suggests the instability produced by this massive and much needed energy transition will force us to grapple with new forms of upheaval.
This is some scenario of the possible green geopolitical tensions to come.

One source of international friction is far more certain to be a part of our energy future than many of the new technologies being touted as the next big thing. Consider the new U.S. approach in the energy and climate bill recently passed by the House of Representatives, which contains provisions for erecting trade barriers to countries that do not adopt measures to limit emissions. Proponents say these are necessary to reduce the chances of companies relocating to countries with lower emissions standards in order to get an unfair competitive edge. Such tariff regimes are also seen as keeping corporations from relocating to places where climate laws may be more lax, such as China.
Green protectionism is already a growth business. When the European Union considered restricting entry of biofuels based on a range of environmental standards, eight developing countries on three continents threatened legal action in the fall of 2008.

In fact, there is a long tradition of such disputes, but the business community is worried that green protectionism could be a defining feature of international markets in the decades ahead.
And of course, the prospect of green trade wars or even just opportunistic fiddling with trade laws to protect local jobs suggests a period of related international tensions, especially between developed countries and the emerging world.
We are also going to witness the complex consequences of the simultaneous rise and decline of petro-states and consequently a rise and a fall of the oil powers
First, the soaring price of oil, which could skyrocket to $250 a barrel, will fill their coffers. Sovereign wealth funds will grow fat again, and with the dollar likely to be weak for years to come, oil fat states will be buying cheap U.S. assets and making American nationalists uncomfortable all the while.
Those sovereign wealth funds still have a few good decades ahead of them. Twenty years from now, the world will still be getting at least three quarters of its energy from oil, coal, and natural gas.
Today's energy infrastructure took years to develop, and even with revolutionary technological change, the energy mix can shift only marginally in the short term. So, as much as the West may wish to reduce its dependence on the likes of OPEC, because it's not good to be too dependent on anyone, because oil is dirty and killing the environment and because Providence has seen fit to identify the world's most dangerous regions by locating oil beneath them, these countries will have considerable power for the foreseeable future.
It's certainly clear that fossil fuels are mangling the climate and that the status quo is unsustainable. There is now a broad scientific consensus that the world needs to reduce greenhouse gas emissions more than 25 percent by 2020 and more than 80 percent by 2050.
Even if the planet did not depend on it, breaking the addiction to oil and coal would also reduce global reliance on petro-states and vulnerability to energy-price spikes.
But though the world should do everything sensible to promote alternative energy, there's no point trying to do everything possible. There are financial, political, and technical pressures as well as time constraints that will force tough choices; solutions will need to achieve the biggest emissions reductions for the least money in the shortest time.
Hydrogen cars, cold fusion, and other speculative technologies might sound cool, but they could divert valuable resources from ideas that are already achievable and cost-effective. It's nice that someone managed to run his car on liposuction leftovers, but that doesn't mean he needs to be subsidized.
Reasonable people can disagree whether governments should try to pick energy winners and losers. But why not at least agree that governments shouldn't pick losers to be winners? Unfortunately, that's exactly what is happening. The world is rushing to promote alternative fuel sources that will actually accelerate global warming, not to mention an alternative power source that could cripple efforts to stop global warming. We can still choose a truly alternative path. But we'd better hurry.

Renewable fuels sound great in theory, and agricultural lobbyists have persuaded European countries and the United States to enact remarkably ambitious biofuels mandates to promote farm-grown alternatives to gasoline. But so far in the real world, the cures, mostly ethanol derived from corn in the United States and in Brazil or biodiesel derived from palm oil, soybeans, and rapeseed in Europe, have been significantly worse than the disease.
Researchers used to agree that farm-grown fuels would cut emissions because they all made a shockingly basic error. They gave fuel crops credit for soaking up carbon while growing, but it never occurred to them that fuel crops might displace vegetation that soaked up even more carbon. It was as if they assumed that biofuels would only be grown in parking lots. Needless to say, that hasn't been the case; Indonesia, for example, destroyed so many of its lush forests and peat lands to grow palm oil for the European biodiesel market that it ranks third rather than 21st among the world's top carbon emitters.
In 2007, researchers finally began accounting for deforestation and other land-use changes created by biofuels. One study found that it would take more than 400 years of biodiesel use to pay back the carbon emitted by directly clearing peat for palm oil. Indirect damage can be equally devastating because of the famine on a hungry planet, food crops that get diverted to fuel usually end up getting replaced somewhere. Today, with 1,2 billion people across the world, including 200 millions children below the age of 10, affected by chronic hunger, starvation is the ugliest reality in today’s world.
The last World Summit on Food Security, held from 16 to 18 November 2009 in Rome, offers a chance to broaden the international coalition that seeks to promote greater food security for more than one billion people in the world, and the call for investment of $44 billion a year to end chronic hunger, promises to eradicate starvation by 2025 and pledge to increase agricultural aid to help poor countries

feed themselves notwithstanding, the last summit in Rome remained a witness to one of the most shameful act of snubbing from rich and developed nations.
None of the G8 nations, barring Italy, attended the hunger summit. This expression of insouciance towards one of the most pressing problems that plagues humanity on this planet is indeed criminal.
The leaders of the Group of Eight leading industrialised countries are guilty of not putting their money where hungry mouths are.
Over 40 per cent of the world population will not have any food to eat in just about 40 years from now.
Food riots will become common occurrences across the world, especially in Asia, Africa, and Eastern Europe. And, at least, five million hunger deaths, half of those of children, are anticipated by 2050 as food and crop production plummet by 37 per cent.
The century that we are in today is indeed a hungry century.

But ethanol profits are prompting U.S. soybean farmers to switch to corn, so Brazilian soybean farmers are expanding into cattle pastures to pick up the slack and Brazilian ranchers are invading the Amazon rain forest, which is why another study pegged corn ethanol's payback period at 167 years.
Rising temperature, a shift in seasons, and extreme weather in coming decades are likely to cut output in some areas like Brazil and wipe out crops entirely in others.
It's simple economics: The mandates increase demand for grain, which boosts prices, which makes it lucrative to ravage the wilderness.
In this matter, Brazil's example is significant, because even if Brazil is seeking a leadership role in global climate talks and says it will adopt targets on greenhouse gas emissions, after agreeing last year to slash Amazon deforestation in half. But it has been slow to research climate change, its impact and how Brazilian agriculture can adapt to the changes.
Deforestation accounts for 20 percent of global emissions, so unless the world can eliminate emissions from all other sources like cars, coal, factories, cows, it needs to back off forests.
That means limiting agriculture's footprint, a daunting task as the world's population grows and an impossible task if vast expanses of cropland are converted to grow middling amounts of fuel. Even if the United States switched its entire grain crop to ethanol, it would only replace one fifth of U.S. gasoline consumption.
This is not just a climate disaster. The grain it takes to fill an SUV tank with ethanol could feed a hungry person for a year; biofuel mandates are exerting constant upward pressure on global food prices and have contributed to food riots in dozens of poorer countries. Still, the United States has quintupled its ethanol production in a decade and plans to quintuple its biofuel production again in the next decade. This will mean more money for well-subsidized grain farmers, but also more malnutrition, more deforestation, and more emissions.
European leaders have paid a bit more attention to the alarming critiques of biofuels, including one by a British agency that was originally established to promote biofuels, but they have shown no more inclination to throw cold water on this $100 billion global industry.
The latest U.S. rules, while continuing lavish support for corn ethanol, include enormous new mandates to jump-start "second-generation" biofuels such as cellulosic ethanol derived from switchgrass. In theory, they would be less destructive than corn ethanol, which relies on tractors, petroleum-based fertilizers, and distilleries that emit way too much carbon. Even first-generation ethanol derived from sugar cane, which already provides half of Brazil's transportation fuel is considerably greener than corn ethanol. But recent studies suggest that any biofuels requiring good agricultural land would still be worse than gasoline for global warming. Less of a disaster than corn ethanol is still a disaster.
Back in the theoretical world, biofuels derived from algae, trash, agricultural waste, or other sources could help because they require no land or at least unspecific "degraded lands," but they always seem to be several years away from large-scale commercial development. And some scientists remain hopeful that fast-growing perennial grasses such as miscanthus can convert sunlight into energy efficiently enough to overcome the land-use dilemmas, someday.
But for today, farmland happens to be very good at producing the food we need to feed us and storing the carbon we need to save us, and not so good at generating fuel. In fact, new studies suggest that if we really want to convert biomass into energy, we're better off turning it into electricity.
Then what should we use in our cars and trucks? In the short term, just gasoline but we will just need to use less of it.
Instead of counterproductive biofuel mandates and ethanol subsidies, governments need fuel-efficiency mandates to help the world's 1 billion drivers guzzle less gas, plus subsidies for mass

transit, bike paths, rail lines, telecommuting, carpooling, and other activities to get those drivers out of their cars. Policymakers also need to eliminate subsidies for roads to nowhere, mandates that require excess parking and limit dense development in urban areas, and other sprawl-inducing policies.
None of this is as enticing as inventing a magical new fuel, but it's doable, and it would cut emissions. In this case, the city of Boulder in Colorado can be taking as a good example.
In the medium term, the world needs plug-in electric cars, the only plausible answer to humanity's oil addiction that isn't decades away. But electricity is already the source of even more emissions than oil. So we'll need an answer to humanity's coal addiction, too.

Atomic energy is emissions free, so a slew of politicians and even some environmentalists have embraced it as a clean alternative to coal and natural gas that can generate power when there's no sun or wind. In the United States, which already gets nearly 20 percent of its electricity from nuclear plants, utilities are thinking about new reactors for the first time since the Three Mile Island meltdown three decades ago, despite global concerns about nuclear proliferation, local concerns about accidents or terrorist attacks, and the lack of a disposal site for the radioactive waste.
France gets nearly 80 percent of its electricity from nukes, and Russia, China, and India are now gearing up for nuclear renaissances of their own.
But nuclear power cannot fix the climate crisis. The first reason is timing: The West needs a major cut in emissions within a decade, and the first new U.S. reactor is only scheduled for 2017, unless it gets delayed, like every U.S. reactor before it. Elsewhere in the developed world, most of the talk about a nuclear revival has remained just talk; there is no Western country with more than one nuclear plant under construction, and scores of existing plants will be scheduled for decommissioning in the coming decades, so there's no way nuclear could make even a tiny dent in electricity emissions before 2020.
The bigger problem is cost. Nuke plants are supposed to be expensive to build but cheap to operate. Unfortunately, they're turning out to be really, really expensive to build; their cost estimates have quadrupled in less than a decade. But in fact, each new nukes will cost nearly three times as much as wind, and that was before their construction costs exploded for a variety of reasons, including the global credit crunch, the atrophying of the nuclear labor force, and a supplier squeeze symbolized by a Japanese company's worldwide monopoly on steel-forging for reactors.
A new reactor in Finland that was supposed to showcase the global renaissance is already way behind schedule and way, way over budget. This is why plans for new plants were recently shelved in Canada and several U.S. states, why Moody's just warned utilities they'll risk ratings downgrades if they seek new reactors, and why renewables attracted $71 billion in worldwide private capital in 2007, while nukes attracted zero.
It is also why U.S. nuclear utilities are turning to politicians to supplement their existing loan guarantees, tax breaks, direct subsidies, and other cradle-to-grave government goodies with new public largesse. Reactors don't make much sense to build unless someone else is paying; that's why the strongest push for nukes is coming from countries where power is publicly funded.
Unlike biofuels, nukes don't worsen warming. But a nuclear expansion, like the recent plan by U.S. Republicans who want 100 new plants by 2030, would cost trillions of dollars for relatively modest gains in the relatively distant future.
Nuclear lobbyists do have one powerful argument: If coal is too dirty and nukes are too costly, how are we going to produce our juice? Wind is terrific, and it's on the rise, adding nearly half of new U.S. power last year and expanding its global capacity by a third in 2007. But after increasing its worldwide wattage tenfold in a decade, China is now the leading producer, and Europe is embracing wind as well, it still produces less than 2 percent of the world's electricity.
Solar and geothermal are similarly wonderful and inexhaustible technologies, but they're still global rounding errors. The average U.S. household now has 26 plug-in devices, and the rest of the world is racing to catch up; the U.S. Department of Energy expects global electricity consumption to rise 77 percent by 2030. How can we meet that demand without a massive nuclear revival?
We can't. So we're going to have to prove the Department of Energy wrong.

Obviously, there is simply no way to reverse the effects of climate change without much more broadly embracing nuclear energy. Not only is it essentially emissions free, scalable, and comparatively energy efficient, but just 1 metric ton of uranium produces the same amount of energy as approximately 3,600 metric tons of oil (about 80,000 barrels). It is a far more sophisticated and proven technology than virtually all of the other emerging alternatives. These facts have already led to a very

real renaissance in nuclear energy, one that is concentrated in the energy-hungry developing world and more than two thirds of announced projects are in developing countries.
Unfortunately, nuclear power is also fraught with real and perceived risks. Plant-safety hazards are pretty minimal, if history is any indicator. However, two real issues loom. One is how to safely dispose of spent fuel, a dilemma still hotly debated by environmentalists. And another is how to ensure the security of the fuel at every other stage of its life cycle, particularly in comparatively cash-strapped emerging countries, which are often in regions scarred by instability and home to terrorist organizations with their own nuclear ambitions.
With each new program, the chances of a security breach increase. Nor is the danger of a bad actor diverting fuel to produce an atomic bomb the only nuclear nightmare we're facing. Radioactive waste could be used to produce a dirty bomb with devastating impact. And fiddling with weapons programs behind closed doors might be the greatest security risk of all.
But considering these growing risks, a deadly nuclear terrorist incident was "almost certain." Such an event would have broad global aftershocks affecting areas as diverse as civil liberties and trade. Imagine, for example, trying to ship anything anywhere in the world the day after. To give just one example, only 5 percent of shipping containers today are subject to visual inspection in the United States. Pressure to make inspection absolute in the wake of a nuclear event could easily lead to the buildup of millions of goods at U.S. ports, driving up consumer-goods prices as market supplies dwindle.
A new nuclear nonproliferation treaty is already on the drawing board, but even as U.S. President Barack Obama works to fulfill his dream of a world free of nuclear weapons, it is already clear that the risks posed by old-fashioned national stockpiles are being eclipsed by those associated with small groups exploiting cracks in an increasingly complex worldwide nuclear infrastructure.

And some bullets are a lot better than others; we ought to give them our best shot before we commit to evidently inferior bullets. And one renewable energy resource is the cleanest, cheapest, and most abundant of them all. It doesn't induce deforestation or require elaborate security. It doesn't depend on the weather. And it won't take years to build or bring to market; it's already universally available.
It's called efficiency.
It means wasting less energy, or more precisely, using less energy to get your drink just as cold, your shower just as hot, and your factory just as productive. It's not about some austerity scold harassing you to take cooler showers, turn off lights, turn down thermostats, drive less, fly less, buy less stuff, eat less meat, and otherwise change your behavior to save energy.
Doing less with less is called conservation. Efficiency is about doing more or the same with less; it doesn't require much effort or sacrifice. Yet more efficient appliances, lighting, factories, and buildings, as well as vehicles, could wipe out one fifth to one third of the world's energy consumption without any real deprivation.
Efficiency is not very fashionable, and the idea that we could use less energy without much trouble hangs uneasily with today's more-is-better culture. But the best way to ensure new power plants don't bankrupt us, or imperil the planet is not to build them in the first place.
"Negawatts" saved by efficiency initiatives generally cost 1 to 5 cents per kilowatt-hour versus projections ranging from 12 to 30 cents per kilowatt-hour from new nukes. That's because Americans in particular and human beings in general waste amazing amounts of energy. U.S. electricity plants fritter away enough to power Japan, and American water heaters, industrial motors, and buildings are as ridiculously inefficient as American cars. Only 4 percent of the energy used to power a typical incandescent bulb produces light; the rest is wasted. China is expected to build more square feet of real estate in the next 15 years than the United States has built in its entire history, and it has no green building codes or green building experience.
But we already know that efficiency mandates can work wonders because they've already reduced U.S. energy consumption levels from astronomical to merely high. For example, thanks to federal rules, modern American refrigerators use three times less energy than 1970s models, even though they're larger and more high-tech.
The biggest obstacles to efficiency are the perverse incentives that face most utilities; they make more money when they sell more power and have to build new generating plants. But in California and the Pacific Northwest, utility profits have been decoupled from electricity sales, so utilities can help customers save energy without harming shareholders. As a result, in that part of the country, per capita power use has been flat for three decades, while skyrocketing 50 percent in the rest of the

United States. If utilities around the world could make money by helping their customers use less power, the U.S. Department of Energy wouldn't be releasing such scary numbers.

The reality is that we need a technological revolution to save the world.
In the long term, it's hard to imagine how, without major advances, we can reduce emissions 80 percent by 2050 while the global population increases and the developing world develop.
So a clean-tech Apollo program modeled on the Manhattan Project makes sense. And we do need carbon pricing to send a message to market makers and innovators to promote low-carbon activities; Europe's cap-and-trade scheme seems to be working well after a rocky start. The private capital already pouring into renewable might someday produce a cheap solar panel or a synthetic fuel or a superpowerful battery or a truly clean coal plant. At some point, after we've milked efficiency for all the negawatts and negabarrels we can, we might need something new.
But we already have all the technology we need to start reducing emissions by reducing consumption. Even if we only hold electricity demand flat, we can subtract a coal-fired megawatt every time we add a wind-powered megawatt. And with a smarter grid, green building codes, and strict efficiency standards for everything from light bulbs to plasma TVs to server farms, we can do better than flat.
Al Gore has a reasonably plausible plan for zero-emissions power by 2020; he envisions an ambitious 28 percent decrease in demand through efficiency, plus some ambitious increases in supply from wind, solar, and geothermal energy. But we don't even have to reduce our fossil fuel use to zero to reach our 2020 targets. We just have to use less.
If somebody comes up with a better idea by 2020, great! For now, we should focus on the solutions that get the best emissions bang for the buck.

Ultimately, we will weed to change our behaviors to save the world. These days, it's politically incorrect to suggest that going green will require even the slightest adjustment to our way of life, but let's face it: Jimmy Carter was right. It wouldn't kill you to turn down the heat and put on a sweater.
Efficiency is a miracle drug, but conservation is even better; a Prius car saves gas, but a Prius sitting in the driveway while you ride your bike uses no gas. Even energy-efficient dryers use more power than clotheslines.
More with less will be a great start, but to get to 80 percent less emissions, the developed world might occasionally have to do less with less. We might have to unplug a few digital picture frames, substitute teleconferencing for some business travel, and take it easy on the air conditioner. If that's an inconvenient truth, well, it's less inconvenient than trillions of dollars' worth of new reactors, perpetual dependence on gas and petrol, or a fricasseed planet.
After all, the developing world is entitled to develop. Its people are understandably eager to eat more meat, drive more cars, and live in nicer houses. It doesn't seem fair for the developed world to say:
Do as we say, not as we did. But if the developing world follows the developed world's wasteful path to prosperity, the Earth we all share won't be able to accommodate us. So we're going to have to change our ways. Then we can at least say: Do as we're doing, not as we did.
But even as those states reach an apotheosis of power due to the price and scarcity of oil, the writing is on the wall. There is no return to oil once the supply peak has eventually been reached, and it is likely that the demand peak will come even before then. Burning oil at today's rate is just not a sustainable course unless you live inland or in far northern latitudes or own a company that manufactures hip waders.
So, the oil states will be rich, influential, and, paradoxically, in decline. The forward-looking among them might use the time they have to plan, to hedge their bets. But the slow death of the oil economy will undoubtedly lead to flare-ups as social pressures translate into political fractures and opportunistic politicians cling to wealth the old-fashioned way, by grabbing it from their neighbors.
Predicting just where these fractures will occur is difficult. But it doesn't take much imagination to conclude that a Russia dependent on oil exports but faced with declining demand, dwindling reserves, and an unprecedented demographic meltdown will feel diminished in ways that are likely to be dangerous for its neighbors. Or consider how oil's inevitable decline will impact the succession struggle in Saudi Arabia, and that's if the current structure hasn't already collapsed under the weight of the ruling family's mismanagement and neglect of its people. Economic powers with a geological death sentence on their heads are likely to be erratic. One way or another, they will make the rest of us feel their pain.

A another main issue is the possibility of water wars as today, 1.1 billion people don't have ready access to clean water, and estimates suggest that within two decades as many as two thirds of the Earth's people will live in water-stressed regions. It has become a new conventional wisdom that water will become the new oil, both because of the new value it will have and the new conflicts it will generate.

Ironically, the hunt for energy alternatives to replace oil could make the water problem much worse. Some biofuels use significant amounts of water, including otherwise efficient sugar cane (unlike rain-soaked ethanol giant Brazil, most sugar-cane producers have to irrigate). Similarly, the various technologies that are seen as essential to the clean use of coal are water hogs. Plug-in hybrid cars also increase water use because they draw electricity, and most types of power plants use water as a coolant. Even seemingly unrelated technologies, such as silicon chips (key to everything from smart-grid technologies to more efficient energy use) require a great deal of water to produce.

Many countries could begin to address this by working out schemes to charge for water, the single best way to grapple with this problem. Alternatively, they may build nuclear desalination plants that make saltwater drinkable. Neither course is perfect. A de facto privatization of water has occurred throughout the world, with low-income populations forced to purchase bottled water to avoid contamination, but even so, the ideal of the right to free water has held firm and governments have found it politically untenable to charge even nominal sums.

And what about those nuclear desalination plants? As countries that have deployed this technology, such as India, Japan, and Kazakhstan, have found, they're bloody expensive, at hundreds of millions of dollars a pop.

These are just a few, fleeting glimpses of the future, but many geopolitical ramifications of moving toward green energy are very much with us already. In India, anxiety among some in the business community is growing as the United States and China meet secretly and not-so-secretly to try to hammer out an agreement on climate change. It's fast dawning on some Indians that their government's tough stance (resisting mandated emissions caps and offering only to keep India's per capita emissions at or below the average emissions in developed countries) could effectively keep it from having a seat at the table when the core elements of a global deal are worked out in the conversation between the world's two leading emitters and a handful of others.

Brazil has a very different view on where such talks should come out because it wants credit for its role as the world's largest absorber of carbon.

Russia also has its particular stance, that of an energy provider, and, as with other countries in northern climes, global warming could increase Russia's tourism income, boost its agricultural output, produce other economic benefits and open new maritime’s route in the Arctic.

Add in the tensions associated with differing views on green protectionism, the shape of relevant international institutions, and the competition for resources and you can easily see how this contentious climate conversation is going to increasingly reshape the world. And who knows which new technologies could make much of today's speculation moot?

The bottom line: A shift away from dirty old fuels is the only path toward reducing several of the greatest security threats the planet faces, but we must step carefully and avoid letting our optimism run away with us.

By acknowledging that a greener world will hardly be devoid of geopolitical challenges and preparing accordingly, we may find a path to defusing our threats today, while largely avoiding the inadvertent drawbacks of desperately needed innovation.

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