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HOW TO GET REAL SECURITY

$11,000 PER SECOND CAN'T KEEP US SAFE

by Amory b. Lovins

On September 11, 2001, the Revolution in Military Affairs shifted into fast forward. The asymmetric warfare we had been worried about for decades became a reality. A poorly financed and technologically impoverished antagonist proved it could mount devastating attacks on the United States.

Asymmetric warfare's first major US episode gave over a million-fold economic leverage to the attackers, doing trillions of dollars of direct and indirect damage with about a half-million dollar budget. What's perhaps most surprising (but understandable, given the historically sheltered nature of our society from such events), is how psychologically effective it was, even though the survival rates were quite high—around 90 percent in the World Trade Center, which is quite astonishing, and roughly 99.5 percent in the Pentagon attack.[1]

It's also now very clear that you can't effectively guard an open society, especially one that has inflicted itself with alarming vulnerabilities, built up over decades. Vulnerabilities include water, wastewater, telecoms, financial transfers, and transportation. If you destroy some critical bits of infrastructure, you can make a large city uninhabitable pretty quickly.

Adapted from remarks at a January 2002 workshop on "Capstone Concepts for Defense Transformation" at the National Defense University, Fort McNair, D.C.

This threat becomes more worrisome as weapons of mass destruction gain more customers.

Telecoms and financial transfer by electronics are particularly vulnerable. The *Los Angeles Times*, *The Washington Post*, and *The Wall Street Journal* recently reported a greatly increased incidence in recent months of probing cyberattacks from the Middle East on electric grids and other critical infrastructure by computer crackers.

As you look over the list of other issues that erode security—the effect of climate change and conflict on increasing flows of refugees; the risks of famine and war; water problems; disease outbreaks (as simulated by the Army War College); the spread of exotic species and invasive pathogens and genetically modified organisms—it's not a pretty picture for a peaceful world.

Traditional thinking about all these issues has been influenced by the supposition that governments are the axis of power and the locus of action, so that we need to focus on governmental and international institutions and instruments. That's the wrong mindset, dangerously incomplete and obsolete, in a world that is now clearly tripolar, with power and action centered not just within governments, but also in the private sector and an Internet-empowered civil society. There are complex interactions among these three actors. Increasingly, government is the least effective, most frustrating, and slowest to deal with, so one ought to focus attention on the other two. Also, each of these three has a kind of antiparticle, as in particle physics. You can have rogue governments like the Taliban, rogue businesses like Enron, and rogue nongovernmental organizations, like Al Qa'eda.

In a tripolar society, power is enlarged and diffused, and everything can happen a lot faster, because there are a lot more ways and channels for it to happen. In the model that we grew up with, governments rule physical territory in which national economies function, and strong economies support hegemonic military power. In the new model, already emerging under our noses, economic decisions don't pay much attention to national sovereignty in a world where more than half of the one hundred or two hundred largest economic entities are not countries but companies. Governments can no longer control their economies or look after their people. With trillions of dollars of capital sloshing around instantaneously at a whim, you might have more economic growth, but you also have extreme local volatility.

You might suppose that the rise of the private sector enhances the prospect for peace, because war is bad for most businesses, and business could therefore be expected to take steps to reduce conflict. But so far, taking into account all of the ingredients of stability, globalization is clearly making stability deteriorate. This is mainly because the trends of the past decade or two have made losers greatly outnumber winners. The gap between rich and poor has grown, and is apparently accelerating. According to the World Bank, of the six billion people on Earth, three billion live on less than $2 a day, and 1.2 billion live on less than $1 a day, which defines the absolute poverty standard. Access to clean water is denied to 1.5 billion people. Meanwhile, the world's richest 200 people are worth an average of $5 billion each. This naturally increases envy and anger. Typically, Western and especially American firms get blamed.

The instability of economies and polities erodes a sense of national or other identity, and therefore decreases stability and makes conditions ripe for nationalism and fundamentalism of all stripes. When nations can't take care of their people, people lose confidence in them and often tend not to vote, because they're not pleased with any of the candidates. Then you get movements backing candidates such as

a formula for security to

- address root causes of terrorism
- support sustainable societies
- achieve energy independence with existing technology
- develop "non-provocative" defense
- make other nations feel more secure
- save money for urgent social needs

Refugee homes in a slum in Nairobi. The perceptible gap between rich and poor threatens stability around the world.

Mark Edwards. Used with permission.

[1] Of course, if, as is widely suspected, there were more hijackings planned, perhaps a total of six, it makes you wonder what the other three targets were. If certain of those possibilities had succeeded, we'd have woken up to a very different country.

Jean-Marie Le Pen in France, with eerie parallels to the rise of Hitler. The growing influence of extreme right-wing parties, now in or tilting governments in at least eight Western European countries, certainly indicates that the problem is not just limited to poor countries.

Hierarchical government is in quite a few respects losing effectiveness and credence. What needs to emerge, and may be starting to emerge, is networked governance. But that only works if it's really tripolar, engaging all three poles—the public and private sectors, plus nongovernmental organizations (NGOs) or civil society.

US Department of Defense

Pallets of bombs delivered to the carrier ***John F. Kennedy***.

While that networked governance—the tripolar world—gels, shifting ad hoc coalitions are seeking topical solutions between pairs or occasionally triplets of those three poles. This is a very sharp contrast to our old mental model of negotiations and treaties between sovereign nations. For example, business and civil society are increasingly joining forces to do what government can't or won't do. Civil society can either grant or withhold the legitimacy that gives business its franchise to operate, and by shifting purchasing and investment patterns, can profoundly accelerate the revolution already visible in business leadership.

Also, of course, evil globalizes, whether through the spread of weapons of mass destruction (by two or sometimes all three of the poles in interaction) or through globalized crime and drugs. Homogenization, culturally driven, largely by the media, fosters the Jihad *v.* McWorld polarity. None of this is welcome, but all of it is being either encouraged or tolerated by US policy—often strongly encouraged, in a way that causes resentment.

In hindsight, it's clearly an error to think of 9/11 as evil in a vacuum. There has been much debate about root causes, trying to figure out why people are so angry with us. A lot has been said about perceptions of humiliation and deculturization, unfairness, bullying, the hypocrisy that weights non-American lives and freedoms as less than our own, and so on.

This is not surprising to readers of such works as Jonathan Kwitny's 1986 book, *Endless Enemies: The Making of an Unfriendly World* (out of print). A *Wall Street Journal* reporter who lived in dozens of countries, particularly in Africa, Kwitny painted an appalling picture of how thoroughly the US government had destroyed what should have been good commercial and cultural relationships—by messing in other people's affairs, backing the wrong people, not understanding whom we were dealing with, and just being disagreeable. His basic conclusion was that if we want other peoples to think well of us, we should be the kind of folks they'd like to do business with, and should ensure that whoever comes to power there should never have been shot at by an American gun. It seems a very pragmatic and principled approach.

Working in about fifty countries, I've been endlessly impressed with how stupidly our country can behave, even through its diplomatic apparatus (as we saw this spring in Venezuela). We Americans are thoroughly disliked, to a degree much greater than our political leaders seem to realize. That's going to be very hard to turn around even if we start now. In fact, we're going hard in the opposite direction, eroding or undercutting practically every peace-promoting, risk-reducing effort put forward by the international community, appearing hypocritical and unilateral, imposing mass-media culture, and showing little understanding of the values of diversity and tolerance, or even, all too often, of the rule of law for which we supposedly stand.

The new American doctrine of exceptionalism (what used to be called "isolationism") is uniting the rest of the world, even our closest allies, against us. I think we will look back on the rapid destruction of treaty regimes that have taken decades to build up, and the credibility we were trying to build, and ask "What on earth possessed us to do that?"

Strategies for Security

In a remarkable speech, almost Churchillian, on October 2, 2001 Tony Blair said, "We need, above all, justice and prosperity for the poor and dispossessed." Martin Luther King, Jr. reminded us that "Peace is not the absence of war, it is the presence of justice." We also, I think, need to remember George Kennan's prescient warning, at the start of the Cold War, that the biggest danger was that we'd become like our enemies. Many elements of the Patriot Act passed by Congress after 9/11—abrogating civil liberties, ignoring the Freedom of Information Act, generally constricting the flow of public information—move us in that direction.

Military superiority won't be enough to win the "war on terrorism." It is said that the kind of leadership we need on Afghanistan has

five dimensions:

- a political one, in which we enhance stability and marginalize the bad actors, so we don't create more monsters like the Taliban and Al Qa'eda;
- a diplomatic dimension where we try to move potential belligerents into a more sympathetic or at least more tolerant stance;
- an informational dimension in which we show the region, Islam, and the whole world that we're not blaming, but rather trying to help the people;
- a humanitarian and economic dimension, in which we improve people's lives so the seeds of conflict don't flourish;
- and a military dimension, in which we bring bad guys to justice, maybe use covert operations and encourage the overthrow of the bad guys, or as a last resort, defeat them in battle.

But it seems to me that what's missing from this five-sided approach is a strategic context. So I'd like to talk a little about what security is, where it comes from, and who's responsible for it, because it's clearer every day that the world's best armed forces, costing $11,000 a second, are not making us secure. That's because—as military professionals have understood for a long time, but not always articulated—*there is no significant military threat to the United States that can be defended against.*

That is, it is not technically possible to defend effectively against ballistic missiles. It is certainly not possible to defend against, say, nuclear warheads or other weapons of mass destruction that are smuggled in without leaving a radar track or other return address. Someone could wrap a warhead in bales of marijuana, put it in a shipping container, bring it aboard a ship to any of our harbors, and nobody would notice.

The point is that anonymous, asymmetric attacks can be quite devastating, but are undeterrable in principle, because you don't know who is responsible for them. That can be especially true with suicidal adversaries. We have already learned that interdiction by prior intelligence can't be relied upon. So the only lastingly effective defense is prevention, not so much at the level of intelligence foresight, which doesn't work reliably, but at the level of root causes, of eliminating the social conditions that feed and motivate the pathology of hatred.

This requires a comprehensive (though not indiscriminate) engagement in a geopolitical and ideological sense that goes far beyond traditional military means and digs down to the foundation of what our society aims to become.

Security has two main elements. The dictionary defines "security" as "freedom from fear of privation or attack." Freedom from fear of privation and freedom from fear of attack are not independent, but are both vital to being and feeling safe.

Can we be and feel safe in ways that work better and cost less than present arrangements? Is there a path to security that is achieved from the bottom up, not from the top down; that is the province of every citizen, not the monopoly of national government; that doesn't rely on the threat or use of violence; that makes others more, not less, secure, whether on the scale of the village or the globe? Can a new approach to building real security also advance other overarching goals, and, ideally, save enough money to pay for other things we need?

I think we can do that.

Freedom from Fear of Privation

Let's start with freedom from fear of privation, which has many obvious elements: reliable and affordable energy, food, water, shelter, sanitation, health; a sustainable and flexible system of production, transportation, communication, and commerce; universal education, strong innovation, vibrant diversity; a healthful environment; free expression, debate, and spirituality; a legitimate and accountable system of self-government at all levels. I would suggest that preserving our security requires all these things for others, too. As Dick Bell of the Worldwatch Institute remarks, weapons and warriors cannot keep us safe "in a world of extreme inequality, injustice, and deprivation for billions of our fellow human beings."

Helping others live decent lives is a worthy mission that our nation has undertaken before. General George Marshall said in 1947 that "there can be no political stability and no assured peace without economic security." He said that US policy must therefore "be directed not against any country or doctrine, but against hunger, poverty, desperation, and chaos." That was right then and it's right now.

US DEPARTMENT OF DEFENSE

Soldiers from the 82nd Airborne arriving in Afghanistan.

You can argue about numbers, and certainly there's plenty of room for innovation in how services are delivered, honestly and effectively. But, for what it's worth, the UN Development Programme says that, today, every poor person on Earth could have clean water, sanitation, basic health, nutrition, education, and reproductive health care for about $40 billion a year. That's a good deal less than

SECURITY

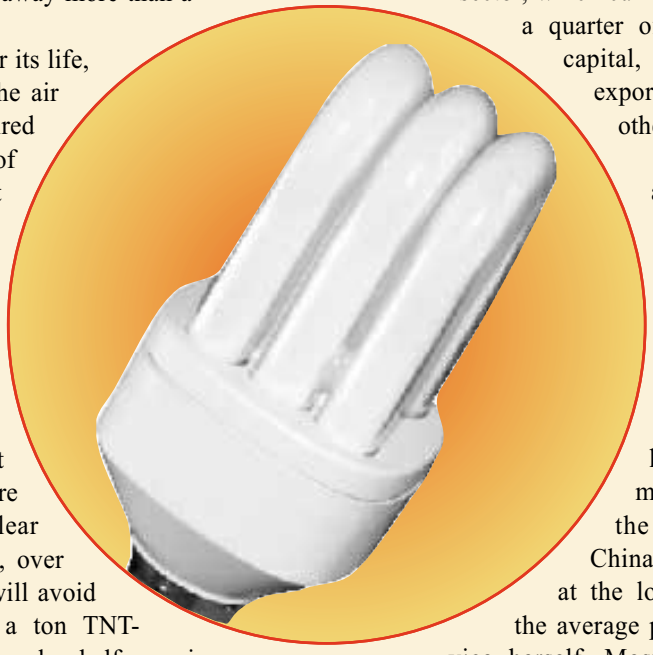
we're spending on our anti-terrorist program in the United States. It's less than a quarter of the tax cut that the president and Congress bestowed on us last year.

But where is the determination to build a muscular global coalition to create a safer world in those fundamental ways? Wealthy nations have reduced their foreign aid contributions in recent years. The $11 billion the United States now allots annually to foreign aid amounts to 0.11 percent of the nation's gross domestic product. (Canada and major European countries spend about three times as much of their GDP on aid.) The Bush Administration has announced a major and long-overdue increase in foreign aid. That could be a very good thing. But it's a small part of what's required, and it's not being framed in the sense or with the vision that General Marshall did half a century ago.

Aid from rich countries is often leveraged to elicit certain behaviors from recipient nations. Treasury Secretary O'Neill said in Ghana that American aid will be directed only to those African nations that exhibit good governance and also "encourage economic freedom"—in other words, those that privatize their industries, reduce subsidies, and open their markets to goods from the United States. But in fact the United States, along with other rich nations, continues to

A Bright and Simple Idea

A compact fluorescent lamp saves 75–80 percent of the electricity used by an incandescent bulb, lasts 8–13 times longer, looks similar, fits the same fixtures and, over the course of its life, will save about $30–80 more than it costs. In fact, it's generally cheaper to give away CFLs than it is to run fossil-fueled power plants needed to power incandescent bulbs; that's why Southern California Edison Company gave away more than a million such lamps.



One such CFL, over its life, will avoid putting in the air from a typical coal-fired power plant one ton of carbon dioxide, eight kilograms of sulfur oxides, and four kilograms of nitrogen oxides. If the electricity is generated from oil, the lamp saves a barrel of oil and all its attendant emissions. Or, if we're talking about a nuclear power plant, one CFL, over the course of its life, will avoid making two-fifths of a ton TNT-equivalent of plutonium plus half a curie (which is a lot) of strontium-90 and cesium-137.

If widely deployed, CFLs could cut by one-fifth the evening peak load that crashes the grid in Bombay. They could raise a North Carolina chicken grower's profits by one-fourth. They could raise a Haitian family's disposable income by as much as one-third, because so much of the sparse cash economy goes for electricity.

A widely unrecognized advantage of such ways of saving electricity is that manufacturing them takes on the order of a thousand times less capital than expanding the electricity supply. When you invest in CFLs, you also get your money back about ten times faster, so it can be quickly invested again. If we do the cheapest things first, then the power sector, which currently gobbles up about a quarter of global development capital, could become a net exporter of capital to fund other development needs.

Such lamps are also the key to affordable solar power that lets girls learn to read, advancing the role of women and reducing population pressure. Currently half a billion CFLs are manufactured annually; the largest maker is China. CFLs can be bought at the local supermarket, and the average person can install service herself. Most of us would never guess such a simple thing could have such an impact globally. But clearly, if we so choose, we can make the world more prosperous, better educated, less polluted and, of course, safer through shared prosperity and justice—one light bulb at a time.

—Amory B. Lovins and L. Hunter Lovins

move away from a policy of open markets, slapping tariffs on foreign steel and lumber and instituting an additional $35 billion in annual farm subsidies. This appears to our friends abroad, particularly in Europe, to be pure electoral opportunism, rejecting the very principles of free trade that we have been urging them to adopt, as well as stifling poor countries' exports to the US.

Beyond the simple application of more cash and making trade authentically fair, other routes to economic security in the developing world are available. We wouldn't normally think of a light bulb as an instrument for security, but building real security can be as simple and as grassroots-based as a compact fluorescent lamp (CFL), costing about $3–12 in competitive markets (see box, page 12). There are many more techniques like that.

Freedom from Fear of Attack

The other side of security is freedom from fear of attack. In an RMI book, *Security Without War* (see access, page 16), published in 1993, but written several years earlier, Hal Harvey and Mike Shuman nicely lay out a new security triad: (1) conflict avoidance and/or prevention, (2) conflict resolution, and (3) non-provocative defense.

Conflict avoidance/prevention, which might be called "presponse," has historically been a low priority, but it ought to be the highest priority. It's by far the most cost-effective way not to be attacked. It comprises elements like justice, hope, transparency, tolerance, and honest government. Many governments are still run by crooks or thugs, but I'm encouraged by the movement within the Organization for Economic Cooperation and Development and by such groups as Transparency International to expose and stop corruption.

Conflict prevention also includes what Harvey and Shuman call "leader control." They note that it's almost impossible to find instances of wars between two democracies, or between two societies that, whatever their outward form of government, have effective ways to find out what their government is up to and tangibly express their displeasure if they don't like it.

there is no significant military threat to the united states that can be defended against.

Effective leader control tends to discourage adventures by leaders who are either crazy or wanting to divert attention from domestic difficulties. It's enhanced by speeding up the information revolution, so citizens can communicate with each other and with the outside world by a diversity of means that will be hard to block. In the earliest days of *perestroika*, someone asked Gorbachev's senior advisor on science, energy, education, and arms control—Academician Yevgeny Pavlovich Velikhov—how the then-Soviet government intended to keep control once citizens got access to modems, faxes, copiers, and the like. His prescient reply was: "You don't understand. The information revolution is our secret weapon to ensure that the reforms of *perestroika* are irreversible."

Another critical tool for preventing conflict is advanced resource productivity—getting lots more work out of each unit of energy materials, water, topsoil, and so on. As Paul Hawken, Hunter Lovins, and I describe in our book *Natural Capitalism* (see access), advanced resource productivity can actually prevent conflict in four ways. First, it can make aspirations to a decent life realistic and attainable, for all, forever. It takes a while, but it's definitely going in the right direction. It removes apparent conflicts between economic advancement and environmental sustainability. You can implement it by any mixture of market and administrative practices you want. It scales fractally from the household to the world. It's adaptable to very diverse conditions and cultures.

Second, resource productivity avoids resource conflicts over things like oil and water. As a result, military professionals can have negamissions.

The Golden Gate Bridge in San Francisco, cited as a possible terrorist target.

Military intervention in the Gulf becomes Mission Unnecessary because the oil will become irrelevant. Just moving to Hypercars® will ultimately save as much oil in the world as OPEC now sells.[2]

Third, resource productivity can make infrastructure invulnerable by design. That's the argument set out in our Pentagon study from twenty years ago, *Brittle Power: Energy Strategy for National Security* (now reposted at www.rmi.org).

And finally, an argument that's a little more complex. Resource productivity can unmask and penalize proliferators of weapons of mass destruction. Along with the late Lenny Ross, we made that argument in detail with respect to nuclear proliferation, in *Foreign Affairs* in summer 1980, in an article entitled "Nuclear Power, Nuclear Bombs." It's enlarged in a book, now out of print, called *Energy and War: Breaking the Nuclear Link*.

The basic argument is that if we use energy in a way that saves money, that is enormously cheaper than building or just running nuclear plants, so any country that takes economics seriously won't want or have nuclear plants. They're simply a way to waste money ("Why Nuclear Power's Failure in the Marketplace Is Irreversible"; see access, page 16). In such a world, the ingredients—the technologies, materials, skills, and equipment—needed to make bombs by any of the twenty or so known methods would no longer be items of commerce. They wouldn't be impossible to get, but they'd be a lot harder to get, more conspicuous to try to get, and more politically costly for both the recipient and the supplier to be caught trying to get, because for the first time, the reason for wanting them would be unambiguously military. You could no longer claim a peaceful electricity-making venture. It would be clear that you were really out to make bombs. The burden would be on you to show that that's not what you had in mind—to do something so economically irrational.

Interestingly, there is a parallel argument, which hasn't been fully fleshed out yet, for certain chemical weapons. In particular, adopting organic agriculture, which tends to work better and cost less and be better for health and nutrition, and can at least equally well feed the world, means that you don't have organophosphate pesticide plants, which means that you just removed the main "cover story" for nerve gas plants. And there's even a weaker, but not trivial, form of the argument: if you're not using transgenic crops, which you shouldn't be if you understand biology and economics, that will remove an innocent-looking cover for making genetically modified pathogens.

Getting back to the roots of conflict in resource rivalries: The broader case I'm making is that resource conflicts are unnecessary and uneconomic—a problem we don't need to have, and it's cheaper not to. For example, 13 percent of US oil now comes from the Persian Gulf, which is clearly risky. Proposed domestic substitutes, such as drilling in the Arctic National Wildlife Refuge, are at least as risky, and probably more so, because the Trans-Alaska Pipeline is about the fattest energy-related terrorist target there is. And therefore, in promoting expanded drilling in Alaska, the Department of Energy has been undercutting the Department of Defense's mission.

Both these kinds of vulnerability, both oil imports and vulnerable domestic infrastructure, are unnecessary and a waste of money. To displace Persian Gulf imports would (at historic refinery yields of gasoline) only take a 2.7 miles-per-gallon increase in the light vehicle fleet. We used to do that every three years, when we were paying attention. Most, if not all, United States oil use could be profitably displaced within a few decades, with current technology. This can happen surprisingly quickly. For example, from 1979 to 1985, GDP increased 16 percent, oil use fell 15 percent, and Gulf imports fell 87 percent. We could do that again in spades. The Department of Defense itself owns many billions of dollars a year of oil-saving potential, as laid out recently through a Defense Science Board on which I served *(More Capable Warfighting Through Reduced Fuel Burden*; see access, page 16). Everything you could do to achieve that also improves war-fighting capability.

I would call your attention particularly to the second of the October 2001 Shell planning scenarios, *Exploring the Future: Energy Needs, Possibilities and Scenarios* (see access). It lays out a technological discontinuity that leapfrogs to a hydrogen economy led by China. This causes global oil use to be stagnant until 2020 and then go down. I think that's perfectly plausible, and in fact, my colleagues and I are helping it to happen.

Conflict resolution is the next layer of defense if conflict avoidance or prevention fails. That's the realm of better international laws, norms, and institutions. Given space constraints, I won't elaborate on it here. There's a huge body of literature and practice on those things. Hal Harvey's and Mike Shuman's book. *Security without War* (see above, page 13) is especially good.

Then, if the previous two layers of protection both fail, and conflict occurs, the last layer of defense, and a very powerful one, is "**non-provocative defense**," which reliably defeats aggression, but without threatening others. The concept was developed in Denmark and Holland, by the children of World War II resistance leaders, who wanted to apply the

[2] In 2000, a young firm that I chair, called Hypercar, Inc., (www.hypercar.com) designed—for a few million dollars in eight months—the direct-hydrogen-fuel-cell, uncompromised, competitively priced, mid-sized, SUV that the Administration's FreedomCAR Car initiative intends to develop over the next ten or twenty years. This concept car is a quintupled-efficiency mid-sized SUV. It can handle five adults and up to 2 cubic meters of cargo. It hauls half a ton up a 44-percent grade, and weighs half as much as usual because its structure is carbon fiber, not metal. Carbon is so strong that the ultralight SUV is at least as safe as a standard steel one, even if they collide.

It goes from zero to 60 miles an hour in 8.2 seconds, gets the equivalent of 99 miles per gallon, and drives 330 miles on seven-and-one-half pounds of safely stored compressed hydrogen. It needs that little fuel because it can cruise at 55 mph on the same energy as a normal car of that class uses just for its air conditioner. The only emission is hot water, so I'm tempted to put a coffee machine in the dashboard. It's a very stiff, sporty car with all-wheel digital traction control. It can be designed for a 200,000-mile warranty. The body doesn't rust or fatigue. It doesn't dent in a 6-mph collision. We think it can be made at a competitive cost, with many times less capital and at least an order of magnitude fewer parts.

Its US potential is to save 8 million barrels a day. It's as if we'd gone drilling in the Detroit Formation and found a Saudi Arabia down there. In addition, such vehicles can be designed to plug in as portable power plants when parked (which cars are, about 96 percent of the time). So a full fleet of all shapes and sizes of such Hypercar vehicles in the United States would ultimately have about four to eight terawatts of generating capacity, which is six to twelve times as much as all the power companies now own. The resulting global potential is to save as much oil as OPEC now sells, while profitably avoiding up to two-thirds of global climate change risk.

lessons from their parents' experience defending their homelands against a powerful invader.

To date, Sweden has executed the most sophisticated design of military forces for non-provocative defense. Its coastal guns cannot be elevated to fire beyond Swedish coastal waters. It has a capable and effective air force, but with short-range aircraft that can't get very far beyond Sweden. The radio frequencies used by the Swedish military are deliberately incompatible with both NATO and the Warsaw Pact, so Sweden will stay neutral.

In every way, by technical and institutional design, they've sought to make Sweden a country you don't want to attack, but one that is clearly in a defensive posture. This approach can ultimately create a stable mutual defensive superiority—each side's defense is stronger than the other side's offense. Each has, by design, at most a limited capacity to export offense.

The basic point of non-provocative defense is to structure and deploy your forces so your adversaries must consider them mainly defensive. That is, you minimize your capability for preemptive, deep strikes, or strategic mobility, and you maximize homeland defense. This means four technical attributes: low vulnerability, low concentration of value, short range, and dependence on local support.

Non-provocative defense means layered deployment in non-provocative postures. That's a theory that was well developed, much criticized, and ably defended in Europe in the 1980s. It had to be, because the towns there are only a few kilotons apart. It depends on forces that are at least as robust as the attacker's forces, but with a decentralized architecture that increases their resilience. It doesn't exclude cross-border counterattack, but that would be limited in scope and range. The defensive superiority should reduce the risk and the attraction of adversaries building and using offensive arms. Of course, non-provocative defense doesn't stop terrorism, any more than National Missile Defense would. But the resilient design helps to disincentivize terrorism, by reducing its rewards, just as the full spectrum of nonmilitary engagement undercuts terrorism's ideological and political base.

There seems, however, to be a worrisome contradiction in current strategic doctrine. To combat current threats, the US undoubtedly needs light, agile, deployable, sustainable forces. But those forces don't fit the definition of non-provocative; indeed, their global reach makes them look like just the opposite. In our short-term need, therefore, lie the seeds of long-term danger. We're shifting toward a "global cop" role—and not so much the neighborhood-policing cop who's on the street befriending everyone and heading off trouble, but the SWAT team that forays out of its fortress only to smite perpetrators. Such force structures and deployments will encourage us to act in ways that use those forces. Worse, they are likely to induce in others the attitudes and behaviors that elicit precisely the asymmetric threats to which the US is most vulnerable.

Since what's viewed by others as provocative depends on observed military facts, not on declared political intentions, there is no obvious solution to this paradox. The nearest I can see is to strive mightily to prevent conflict, merit trust, and try to make the global-cop role temporary and brief by making the world safer.

It's a lot better to prevent conflict from scratch than to combat a broadly based terrorist movement. There are some strong stars we can steer by. Our interests in the Third World would be much better advanced by democratization, anti-corruption, sustainable development, resource efficiency, fair trade, demand-side drug policies, pluralism, tolerance, and humility, than by most of what we're doing now. Third World security would be better advanced by those elements plus transparency and collective tripolar security arrangements—possibly even including an idea some people have had, of some countries' giving up their armed forces and buying a credible kind of insurance from, say, the UN, paying fees for sharing in protective forces. And of course, the non-provocative new triad approach that I outlined can enhance everyone's security, but never at the expense of anyone else's security.

To start rebuilding America's lately tarnished credibility as a partner in that sort of world, we're going to need renewed US leadership in multilateral tasks, whether it's the Non-Proliferation Treaty, plutonium reduction, Chemical and Biological Warfare treaties and enforcement, climate protection, or anti-landmine efforts. It's a very long list, and right now our government is on the wrong side of every one of those issues.

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And, of course, there's America's deepest potential strength: the primacy of underlying moral values and civics, which is much referred to rhetorically, but less honored in practice. This will require us to transform more than the military. Military transformation is only part of the challenge to American idealism and ingenuity to building real security. The foundation, which is a very sound notion from about 1787, is the shared and lived belief that security rests on economic justice, political freedom, respect for laws, and a

SECURITY

common defense. To make that work, we're going to have to bridge the widening gulf in our society between its civil and military elements. We'll also need to address the problem that military hardware and service vendors in the private sector have an unlimited self-reinforcing feedback loop where they co-produce weapons and fear, and there is no equilibration—no negative feedback to limit the self-reinforcing cycle of supply and demand.

Until now, the weapons vendors have had a radical monopoly, as Ivan Illich describes it, on providing "security services." If the only way we can imagine to get security is by buying more weapons, then the demand for weapons appears to be inelastic, especially if reinforced by the sometimes-corrupt political process of buying them. Instead, if we have other ways of providing security, of which weapons are just one, and must compete with other modalities, fairly and at honest prices, then we will gain much cheaper ways to provide the security services we want.

In the Cold War, security was viewed as a predominantly military matter. Appended and subordinated to military security were economic, energy, and resource security (consisting, for example, of our Naval fleets in and around the Persian Gulf). Environmental security wasn't even on the agenda. In fact, it was officially viewed as harmful to security and prosperity. But in the post-Cold-War view, we need to add back the missing links between these four elements, and to turn the wasted resources into prosperity and peace. You can imagine these four elements as vertices of a tetrahedron, an immensely strong structure, especially if it surrounds a kernel of justice, whose presence, as Dr. King said, is peace. we

Amory Lovins has been called "one of the Western world's most influential energy thinkers." He has received both a MacArthur Fellowship and a Right Livelihood ("alternative Nobel") award. He has authored or coauthored twenty-seven books, and consults for industries and governments worldwide.

ACCESS

Rocky Mountain Institute (RMI)

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An NGO cofounded by Hunter and Amory Lovins in 1982, RMI pioneered the concept of showing businesses, communities, individuals, and governments how to reduce expenses and increase profits, while conserving natural resources (primarily by becoming much more efficient). Its services include research; consulting; education via professional seminars, the media, and direct public outreach; and strategic influence work directed at political and industrial leaders and other decision-makers and institutions in positions to make a difference. RMI is supported half by programmatic enterprise and half by grants and donations.

Why Nuclear Power's Failure in the Marketplace Is Irreversible (Fortunately for Nonproliferation and Climate Protection)

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London SE1 7NA, UK
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Excerpts, downloadable chapters, and more information at www.natcap.org