



RICE UNIVERSITY'S
BAKER INSTITUTE | 20 YEARS
1993-2013

2013 POLICY RECOMMENDATIONS FOR THE OBAMA ADMINISTRATION

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Preface

Four years ago, we published a book of Baker Institute policy recommendations for the first Obama administration. We noted the “unique and historic opportunity to influence the course of events toward positive ends.” Indeed, amid the foreign and domestic developments of the past four years, major decisions were made: large-scale stimulus spending and federal aid to the auto industry, health care reform, the final withdrawal of U.S. troops from eight years of war in Iraq, and plans to end the even longer American military presence in Afghanistan.

The second Obama administration faces an equally complex policy environment. While generating economic growth at home amid continued risk of financial instability abroad remains a key policy challenge, numerous crises around the globe require policy attention. In this context, the fellows and scholars of the Baker Institute have drafted new recommendations for the incoming administration. Within each issue area, these recommendations provide policymakers with an analytic overview of the opportunities and challenges that need to be addressed by longer-term, strategic policy formulation. It is our hope that our recommendations will prove to be useful starting points for decision-makers working to develop comprehensive, forward-looking policies.

The Honorable Edward P. Djerejian
Founding Director
Rice University’s Baker Institute

Spotlight on the U.S. Space Program: Problems and Solutions

by George W.S. Abbey

Overview

In today's budget environment and what is likely to be the budget environment for some time to come, NASA needs to establish some clear and meaningful priorities. Staying on the present course does not provide the nation with a meaningful and visionary program. A reassessment of the present course of action is very much in order. In light of this, we offer the following recommendations:

- **Recommendation 1:** Maximize support for the International Space Station (ISS) and robotic space exploration.
- **Recommendation 2:** Prioritize biomedical research to understand and develop countermeasures to protect long-duration spacefarers. Carry out this research in collaboration with our space station international partners.
- **Recommendation 3:** Include China as a partner on the ISS, regaining the dual access to the ISS that was lost when the U.S. space shuttle program ended, an approach already supported by our international partners.
- **Recommendation 4:** Reinvigorate an effective space and aeronautical research and development program within NASA that will stimulate and develop a new generation of scientists and engineers.
- **Recommendation 5:** Elevate the priority of Earth observation missions. More research is needed to understand rapidly changing surface and atmospheric conditions.
- **Recommendation 6:** Re-evaluate the need for, and the cost effectiveness of, the National Launch System and the Multi-Purpose Crew Vehicle (MPCV) and the ability of the MPCV to support realistic space exploration architectures.
- **Recommendation 7:** Give major consideration to in-orbit assembly options and architectures for manned space exploration that would negate the need to design a space exploration vehicle for reentry into the Earth's atmosphere. A variation of the X-37 could carry crews to and from orbit.
- **Recommendation 8:** The true catalyst for increasing the commercialization of space is reducing the cost of flying to space. Develop fly-back booster rockets that could operate with a variation of a reusable spacecraft such as the X-37, thus providing a total reusable system, in order to dramatically reduce the costs of flying in space.

Background

“Well, space is there, and we’re going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And therefore, as we set sail, we ask God’s blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked.”

—John F. Kennedy, U.S. President, September 12, 1962

“For any country, for any people, a space program is indispensable; the program mirrors the rising global status of China.”

—Wang Zhaoyao, Director, China Manned Space Agency, June 29, 2012

At 8:40 am on July 15, 2012, *Soyuz TMA-05M* was launched from Baikonur, Kazakhstan, carrying Russian cosmonaut Yuri Malenchenko and astronauts Sunita Williams and Akihiko Hoshide into space to rendezvous with the International Space Station (ISS). It was just six days short of a year since the last American space shuttle, *Atlantis*, touched down at the Kennedy Space Center on July 21, 2011. *Soyuz TMA-05M* was the fourth flight of a Russian spacecraft carrying crews to the ISS since the U.S. space shuttle’s final flight.

The *Soyuz* spacecraft launched that Sunday morning in Baikonur now represents the only means to carry Americans to the ISS. Unfortunately, this will not change for a very long time. Since that morning in July, another *Soyuz* crew, which included American astronaut Kevin Ford and Russian cosmonauts Oleg Novitskiy and Evgeny Tarelkin, was launched to the ISS on October 23. And on December 19, 2012, a crew that included the first Canadian commander of the ISS, astronaut Chris Hadfield; American astronaut Tom Marshburn; and Russian cosmonaut Roman Romanenko was launched from Baikonur. For America and our international partners on the space station, the road to Baikonur and its *Soyuz* launchpad will be the road to space for many years to come.

The space shuttle carried American astronauts to space from 1981 until its last flight in 2011. The shuttle amassed an impressive record of achievements during its lifetime, including the very successful assembly of the ISS—which was not only designed to be assembled by the shuttle, but also to be serviced by the space shuttle. The ISS is a truly international station that brought Russia in as a partner, along with Canada, Europe, and Japan. Russia was made a partner because it makes a significant contribution to the ISS and, with its capabilities, provided dual access to the station. Thus, access was assured to the station if either the United States or Russia had a problem with their respective launch vehicles or spacecraft. The wisdom of that decision was proven in 2001 when Russia had a problem with its launch vehicles and again in 2003, after the *Columbia* accident. Yet barely a year later, the need for logistic support and the importance of dual access to the ISS were both ignored when President George W. Bush announced in 2004 the decision to end the shuttle program with the completion of the assembly of the ISS in 2010. That decision could have been reversed by the new administration, but it was reaffirmed.

Without the shuttle, the United States and the international partners—Canada, Europe, and Japan—are all dependent on Russia and its spacecraft, the *Soyuz*, and its unmanned cargo vehicle *Progress* to take the crews and supplies to and from the space station and to provide the majority of logistical support.

There are decisions that are made throughout a nation’s history that have significant impact on its future growth and development and its ability to be a world leader. America’s development, construction, and operation of the space shuttle was in a sense no less a technological achievement than the nation’s successful landing on the moon. The shuttle was a reusable orbiter spacecraft that had the demonstrated ability to deliver large structures to space, and to retrieve, repair, and service both satellites and space telescopes. It provided the only way to assemble large structures in space, such as an ISS or a spacecraft that could fly out of Earth orbit to the moon and to the planets. In addition, with the exception of its fuel tank, the shuttle was reusable. It continued to demonstrate America’s technological leadership every time it flew. Today, the nation and our international partners are left with an assembled space station that cannot be adequately supported or serviced. The plan to rely on the yet unproven “commercial space industry” to provide limited support to the station over and above Russia’s *Progress* spacecraft, as well as European and Japanese infrequent logistical support spacecraft, places at risk the research yet to be accomplished on the space station.

The uncertainties and risks created by relying on only one means of flying humans to the ISS did not take long to become apparent. On August 24, 2011, about a month after the end of the U.S. space shuttle program, Russia experienced a failure of the *Soyuz* launch vehicle carrying an unmanned *Progress* spacecraft to the ISS. At about 325 seconds into the flight, and shortly after the third stage was ignited, the vehicle itself commanded a shutdown due to an engine anomaly. Unable to achieve its planned orbit, and given the trajectory and energy of the spacecraft at the time of engine shutdown, the vehicle and its three tons of supplies crashed in the Altai region of the Russian Federation.

The “dry” cargo tucked aboard the *Progress* amounted to 2,777 pounds of food, spare parts, life support gear, and experiment hardware. The *Progress*’ refueling module carried 2,050 pounds of propellant for transfer into the Russian segment of the complex that supplies the station’s maneuvering thrusters. The vessel also carried 926 pounds of water and 110 pounds of oxygen and air.

The cause for the failure had to be understood and corrected before the *Soyuz* could be launched with a crew of astronauts and cosmonauts. Fortunately, the Russians resolved the problem—narrowly averting the possibility of an unmanned space station—and successfully launched three crewmen to the station on November 13, 2011. A *Soyuz* spacecraft has a limited lifetime on orbit. It carries a three-person crew to the space station and remains docked to the station throughout the crew’s six-month stay. The *Soyuz* has to return before its lifetime runs out. The lifetime limitation on the docked *Soyuz* spacecraft dictated that the crew manning the station would have had to return to Earth by no later than November 21—a close call to say the least.

A little over a month later, on December 23, a Russian communications satellite crashed just after liftoff when its rocket apparently failed. It was the fifth failed space mission experienced by Russia in 2011. The communication satellite was being launched from Plesetsk Cosmodrome in Russia on a *Soyuz-2* rocket, an upgraded version of the typically dependable *Soyuz* booster.

On January 27, 2012, Russia announced that worrisome cracks in the *Soyuz* spacecraft being prepared for a March launch had forced the postponement of the next two manned flights to the ISS. This situation brought back memories of the problems experienced in 2011 that left Russia's space transport vehicles grounded and again led to speculation that the space station might have to be abandoned.

Six crewmembers were aboard the ISS as members of Expedition 30, the 30th astronaut crew to man the space station. They included two Americans: commander Dan Burbank, who had been in space since November 16, and flight engineer Don Pettit. They were scheduled to return from the station on a March 30 flight. That return flight was postponed until mid-April.

Future *Soyuz* liftoffs were postponed because the *Soyuz* TMA-04M spaceship cracked while it was being tested in a pressure chamber and precluded the reentry capsule being used for any manned spaceflight. Due to the delay of the March 30 launch, the *Soyuz* TMA-05M mission was also delayed until the middle of July. Such problems unfortunately happen. Systems and spacecraft are not perfect. When these situations occur, dual access to the station becomes critical.

In addition to relying on the Russians being successful in their efforts to support the space station, NASA is also providing funding to three commercial space endeavors for American logistical support and crew transport. The *Dragon* capsule built by a California company, Space Exploration Technologies (SpaceX), has successfully performed two logistical flights in support of the station. However, these programs are several years away from having an initial operational capability for human spaceflights. Also, it is still an open question as to whether these companies will be able to operate with a sustainable and profitable business model. Their primary customer is the U.S. government. Thus, their long-term viability is in question, and we can expect that the gap in U.S. human spaceflight capability that started with the grounding of the space shuttle will likely last another five years or longer. NASA is also moving forward with the development of its Space Launch System (SLS)—a new heavy-lift vehicle—without any agreed upon destination or requirements. A major concern with the new system is related to the rocket itself.

The SLS and its associated requirements have been dictated by Congress. The NASA Authorization Act of 2010 mandated that NASA begin immediate work on the SLS, with a 2016 deadline for initial readiness. The performance requirements for the rocket are for an initial launch capacity of 70 to 100 tons, expandable to at least 130 tons. Congress

also stated that, wherever possible, the SLS should include technology from the 1970s-designed space shuttle and from the cancelled Constellation program. The stated mission of the SLS is to explore deep space and to provide a NASA-owned option for reaching the ISS. The 70-ton capacity of the vehicle is of questionable value. The SLS is considerably oversized for supporting the space station, and the specific transportation requirements for exploring deep space are not clear since there is no definite destination or exploration architecture.

The 35,678-lb. truss segments delivered to the space station in June 2007 on the STS-117 mission was one of the heaviest payloads ever taken to the ISS. A 70-ton requirement greatly exceeds the 35,000-lb. payload carried by that space shuttle *Atlantis* flight.

The schedule for the new launch vehicle will depend on future NASA budgets. A first launch planned for 2017 will launch only a single stage of the SLS. NASA documents suggest that with a flat agency budget providing about \$41 billion from 2012 through 2025, NASA will not be able to do much work on the second stage of the SLS until after 2017, with a first manned flight projected to occur in 2021.

This flight would presumably use what NASA has called a multi-purpose crew vehicle (MPCV). It is not clear what its multiple purposes will be, when and if it ever flies, though NASA has stated that the spacecraft would take astronauts to a still-to-be-determined destination. The MPCV has none of the capabilities executed so well by the space shuttle, such as supporting extravehicular activities (EVAs) and being able to assemble large structures in Earth orbit. The MPCV cannot support such activities. NASA has not established a design freeze or launch date for MPCV, and stated that its target mass is 28 tons. But it has said that number is subject to fluctuation as the design matures. The MPCV is in reality a continuation of the *Orion* spacecraft from the Constellation program. It will land by parachutes in the ocean. At its projected weight, it will indeed require very large parachutes.

In today's budget environment and what is likely to be the budget environment for some time to come, NASA needs to establish some clear and meaningful priorities. Staying on the present course does not provide the nation with a meaningful and visionary program. A reassessment of the present course of action is very much in order.

NASA's number one priority should be building on its two very successful programs: the ISS and its equally successful robotic exploration and science programs. Both programs should be vigorously supported. Of equal importance and priority is reestablishing and reinvigorating an effective research and development program within the agency—a research program that would involve both space and cutting-edge aeronautical research. NASA no longer has a strong and innovative research and development program such as existed in past years. If it is going to develop the talented engineers and leaders of the future, the young engineers and scientists need to be challenged with an active and ongoing space and aeronautical research program. The National Academies report

Rising Above the Gathering Storm highlighted the critical need for, and the importance of, investing in research and development.¹ NASA's shift away from research and development has worsened the problem. The agency's past successes are in no small way a result of the development of a cadre of bright young engineers and scientists steeped in a solid background of hands-on research and development. NASA icons such as George Low, Max Faget, and Chris Kraft developed their skills through such progressive programs.

The true catalyst for increasing the commercialization of space is reducing the cost of flying to space. The space shuttle was a step in that direction, but it fell short in achieving that goal. That is not to say that it will not help to pave the way for future efforts to achieve that objective. The space shuttle originally started out with a fly-back booster. NASA studied flyback boosters again more than a decade ago as part of a potential suite of upgrades to the space shuttles, but never pursued its development. The fly-back booster was considered too big a step in the 1970s to develop in parallel with the shuttle. Today it is well within the state of the art.

The U.S. Air Force has a vision of the future that includes rockets that are not only reusable, but also spacecraft that are able to fly back to Earth and land autonomously on a runway. And just as SpaceX founder and chief executive Elon Musk said in a speech at the National Press Club in Washington, D.C., a fully reusable rocket would dramatically decrease the cost of lifting cargo and humans to space, making the exploration and colonization of Mars at least feasible.² SpaceX has successfully tested its concept for a fully reusable rocket called Grasshopper at its proving ground in McGregor, Texas.

The Air Force has already flown two very successful missions of a small-scale version of the space shuttle, Boeing's robotic space plane X-37B. Like the space shuttle, the X-37B launches on a rocket and flies back down to a runway after reentering the Earth's atmosphere.

The chief engineer of the Space and Intelligence Systems' Experimental Systems Group at Boeing presented a paper at the American Institute of Aeronautics and Astronautics' (AIAA) Space 2011 conference that discussed the possibility of a manned version of the X-37B, a larger X-37C that could be used as a cargo ship for the International Space Station. He said that it could also be easily modified to carry up to six passengers. Unlike other cargo carriers slated to become manned spacecraft, the X-37B doesn't necessarily require major design changes. As in aviation, this vessel would keep our spacecraft on a similar track of evolution as that which occurs in the world of atmospheric flight. Our commercial aviation world has seen evolution and improved designs from Boeing's early 707 to today's 787. In contrast, capsules and parachutes return us to the early days of aerospace technology. With a research and development program, utilizing a modified X-37B and a fly-back booster, NASA could pave the way for low-cost reusable spacecraft and launch vehicles and reestablish our leadership in the competitive world of launch vehicles. Russian space officials have already said the first flight of a reusable Russian

rocket booster that returns to a runway under its own power could occur by 2020. Many studies are being undertaken and architectures designed without giving priority to the life-science problems associated with long-duration flights beyond Earth orbit. Radiation protection for humans must be a major consideration for such flights. An aggressive research program to understand and develop the means for protecting the crews in this hostile environment has to be a prime consideration. An integrated research program should be undertaken as a priority with all the international partners to not only address radiation but to address all the life-science issues of long-duration spaceflights. The space station provides an excellent laboratory for performing this research, which should be undertaken by working together with all the partners and an integrated crew of astronauts and cosmonauts.

Space also provides an outstanding platform for studying our planet and its environment. NASA's Earth Observation Missions have contributed to not only increased scientific knowledge of Earth's surface and atmosphere but have also been critically important to weather prediction, hurricane tracking, and responding to natural disasters, among other societal applications. This program is equally deserving of continuing and elevated attention.

An additional priority is initiating a realistic human exploration program that returns man to the moon as its first step. The moon provides an excellent laboratory to test and learn how to operate in a remote location. It will provide the learning and experience for human exploration in space beyond the moon and it is only a three-day flight away in the event of a problem. The recommended human exploration program should build on the international partnerships of the ISS to develop the architectures and plans for an international human exploration program.

Consideration should also be given to in-orbit assembly options for manned space exploration systems. An orbiter-type vehicle could be utilized as a key element of such a system. The orbiter-type vehicle would be used as advocated by George Jeffs, the chief engineer for North American Aviation's Apollo Program: for assembly activities in orbit, and most importantly for the crew Earth-to-orbit and orbit-to-Earth transfer. Reliance on such a vehicle for reentry would eliminate having to design exploration spacecraft to carry all the weight of items such as heat shields, parachutes, and landing impact structure to outer space, as well as cut the energy needed to transport this otherwise useless added weight throughout the entire deep space mission. The design of the spacecraft to be flown to outer space could then be optimized for its exploration mission. This approach essentially would trade off these advantages against the development of an additional propulsion module for return from deep space to high/low Earth orbit. An orbiter-type vehicle, such as a modified X-37, could play a key role in the early development of such an in-orbit assembly system.

The exploration program should also take advantage of all the in-line capabilities of the ISS from its inception, and consideration should also be given to expanding the

partnership. This year China demonstrated crewed rendezvous and docking, flying a crew of three (which included China's first female astronaut) to their crew-tended *Tiangong-1* orbital vehicle. China plans to launch *Tiangong-2* in 2013 and *Tiangong-3*, a Zvezda-class core module, in 2020.

The dual access we lost to the ISS, a capability we had with the space shuttle, can be regained by bringing China into the station program. The United States could lead the way in adapting the Shenzhou spacecraft to be compatible with ISS. The U.S. would continue funding the three commercial space endeavors as they would supplement and support the logistical needs of the station that were lost with the retirement of the shuttle. Jean-Jacques Dordain, director-general of the European Space Agency (ESA), and Vladimir Popovkin, head of the Russian space agency Roscosmos, have already expressed a desire to bring China into the International Space Station. It is clear that our international partners see the benefits of working with the Chinese on the ISS. It is time for the United States to provide the leadership to make it a reality.

On its present course, the United States is losing its perceived leadership role in human space exploration. By taking advantage of its flagship programs, the ISS and robotic space exploration, moving forward with the outlined research and development program, proposing initiatives to significantly reduce the cost of flying in space, implementing an exploration program to optimize collaboration with our international partners, and showing leadership in working with China, the U.S. could once again be leading the way in exploring the final frontier.

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George W.S. Abbey, the institute's Baker Botts Senior Fellow in Space Policy, is the former director of NASA's Johnson Space Center in Houston.

Foreign Policy: Toward a New Balancing Strategy

by Joe Barnes

Overview

The world is shifting—slowly but inexorably—toward a multi-polar system. The United States will continue to be the most powerful country in the world for the foreseeable future. But we will not be able to regain the unique position we had in the immediate aftermath of the Cold War. Other countries, notably China, will be seeking a greater role in international affairs. The shift toward a more multi-polar world makes it imperative for the United States to adopt a balancing strategy that reduces unnecessary commitments and enhances our flexibility.

- **Recommendation 1:** A two-track approach to China, emphasizing cooperation even as we maintain ties with existing allies, like Japan, and cultivate better relations with other regional powers, such as India.
- **Recommendation 2:** Retrenchment in the Muslim world, where our costly involvements in Iraq and Afghanistan demonstrate the danger of overestimating our power and overtaxing our resources.
- **Recommendation 3:** A reassessment of our role in the Palestinian-Israeli peace process, in light of the past failure of U.S. efforts and the rapidly closing window of opportunity for a two-state solution.
- **Recommendation 4:** A low-key approach to the “Arab Spring” that recognizes the limits in our ability to shape events in the Middle East.
- **Recommendation 5:** Further reduction in our military profile in Europe, which, despite its economic travails, is more secure from foreign attack than any period in recent history.
- **Recommendation 6:** Avoidance of unnecessary confrontation with Russia, a country that—except for its nuclear arsenal—poses little strategic threat to the United States.

The balancing strategy we suggest will no doubt raise criticisms from isolationist and interventionist alike. But we believe that will resonate with the public during an era of economic hardship and fiscal austerity.

Background

Crafting a grand foreign policy strategy is easy; the grander, indeed, the easier. Any group of foreign policy experts, whatever their partisan persuasion or personal background, can produce an impressive list of ambitious goals for any president embarking on a term in office. Actually implementing a strategy, on the other hand, is excruciatingly difficult. On Jan. 20, 2013, President Obama will face a host of constraints, both foreign and domestic. At home, he will find his freedom of action limited by the Congress' powers of oversight and the budget; bureaucratic inertia at the Departments of State and Defense, the Central Intelligence Agency, and other agencies; and a multitude of interest groups lobbying on behalf of often contradictory positions. Abroad, the president will face those crises—unpredictable by their very nature but potentially historic in their consequences—that have driven U.S. foreign policy from the onslaught on Pearl Harbor to the attack on the World Trade Center. There will be times that he will laugh ruefully at the very concept of the “imperial presidency.”

This is not to counsel despair. The president of the United States bears a unique responsibility both for the welfare of our citizens and for the stability of a world that grows ever more interdependent. And his power, though far from absolute, is substantial. He retains primary authority for the conduct of U.S. foreign policy and significant freedom of action in the international arena. Above all, he is the leader of the preeminent state in the world. Despite recent difficulties, the United States remains an economic giant with an incomparable store of human, physical, and institutional capital. Our cultural reach—through music, films, and television—is unparalleled. Our ideology—democratic capitalism—has no global rival. Our network of allies, both formal and informal, gives us a unique ability to leverage our power on a global scale. We possess an important, sometimes decisive, voice in international bodies like the UN Security Council and the International Monetary Fund. Not least, we possess a military establishment able to project decisive force at immense distances.

Still, it is vital that the president husband his political capital at home and the nation's credibility abroad. He should beware, in particular, of raising unreasonable expectations in the international arena. This is particularly true of issues, like the Arab-Israeli dispute, that prompt high emotion even as they defy solution. Presidential flights of rhetoric can both educate and inspire. But they should always keep the ground firmly in sight.

The key geopolitical fact facing the president—and, indeed, his successors for decades to come—is the world's gradual shift to a multi-polar system. There is no point in joining the debate on American decline, a fruitless argument that generates much heat but little light. The facts are simple: today the United States represents roughly 20-25 percent of world GDP and spends about as much on defense as the rest of the world combined. It is hard to imagine the circumstances under which this will be true in 25, much less 50, years.

Let us make one thing clear: the United States is not falling behind. Others are simply catching up. That they are doing so does not reflect the superiority of their political or economic systems to our own. Countries like China and India, with their huge and relatively poor populations, are better positioned—given reasonable economic policies—to post growth rates higher than ours. We should expect economic convergence over time. Indeed, were such convergence not to occur, it would represent a true tragedy for the hundreds of millions of individuals in these countries who still endure lives of material privation. When China eventually surpasses the United States in GDP, it should not be an occasion of national panic but of sober reflection upon the challenges a more multi-polar world presents us.

Moreover, the United States will remain the most powerful country in the world for the foreseeable future. No other state begins to possess our mix of economic, diplomatic, and military power. But the idea that we will regain and permanently retain the unique position in world affairs that we enjoyed in the aftermath of the Cold War is a fantasy. Other countries will be expanding their influence in world events whether we like it or not. Our resources are finite. Our influence is limited. We are no longer in a position to squander either.

We will discuss, at some length, how we can best balance the increasing power of China. But it should be stressed that the balancing strategy we propose is not limited to the specific case of China. Were a rising India, for instance, to threaten U.S. interests in the future, we might well find ourselves joining Beijing in balancing New Delhi's ambitions. The point of a balancing strategy is to provide the United States with flexibility in an uncertain world. And this will require the exercise of nimble diplomacy and, even more importantly, a hard-nosed, even ruthless, effort to free ourselves of costly commitments in places like the Middle East.

Recommendation 1: Adopt a two-track approach to China

China's economic rise is surely the most important geopolitical development since the end of the Cold War. Chinese leaders clearly see their country as a future superpower. And they have, unsurprisingly, sought an international role commensurate with China's economic strength.

It is vital that we not exaggerate the threat posed by China, particularly in the near term. Its military establishment, though modernizing, is modest compared to the United States. China is not years, but decades away from matching our ability to project power. It remains, after all is said and done, a very poor country compared to the United States. It faces challenges—ranging from an undercapitalized domestic banking sector to a housing bubble—that may prompt a slowdown in growth in the short- to medium-term. Even China's vaunted export sector faces stiff competition as wages rise relative to countries like Vietnam. Not least, its government—though still nominally communist—depends upon continued high growth for its legitimacy.

The last factor, in particular, makes it imperative that we adopt a hedging strategy toward China. We simply do not know the future of Chinese domestic politics. Will China move in a democratic direction? Will its current leadership turn in a more nationalistic direction if its hold on power is threatened? Will the country descend into disorder? Given these imponderables, we must lay the groundwork now for a possible deterioration in Sino-American relations. The historical record when it comes to the rise of new powers is sobering: the rise of Germany and Japan in the late 19th and first half of the 20th centuries suggests that emerging powers can introduce instability into international orders.

We do not have to look far for partners in addressing the rise of China. We have traditional allies in Japan, South Korea, and Australia. India can provide an important counterbalance to Chinese influence. To a lesser extent, so can countries like Vietnam, which have long harbored suspicion of Chinese regional ambitions. Russia, too, may one day be a key element in any strategy to balance growing Chinese strength, an important reason to keep our relations with that admittedly troublesome country from deteriorating too far.

A two-track approach to China will require deft diplomacy if we are to undertake it without prompting a sharp and counterproductive Chinese response. We will need to match efforts to cultivate potential partners, such as India, with outreach to China on areas of mutual concern. The latter includes handling what will almost certainly be the ultimate collapse of the North Korean regime, limiting the proliferation of weapons of mass destruction, combatting terrorism, and ensuring the security of international sea lanes.

Above all, we need to restrain our rhetoric. Tibet, Taiwan, and, above all, trade are all potential areas of disagreement between the United States and China. The president's object should be to manage these differences in ways that minimize damage to the overall U.S.-Chinese relationship. And he should be neither surprised nor outraged when China asserts prerogatives—in international forums, in territorial disputes, or even in the foreign policy of its neighbors—that have long been accepted as the norm for great powers.

The day may—and we stress “may”—come when we will have to confront China. To hasten that day unnecessarily, however, would be an act of historic folly. Conflict between the United States and China is by no means inevitable. Moreover, we will have time to counteract any rising military threat from China, which is still far from representing a substantial challenge to our naval and air forces. Remember: there is no better way to make an enemy than to go looking for one. And, with China, we would face an enemy more formidable than any we have confronted since the end of the Cold War.

Recommendation 2: Pursue a policy of retrenchment in the Muslim world

Reducing our military commitments in the Muslim world will be crucial to a new balancing strategy. Since the turn of the century we have embarked on major military

operations in Iraq and Afghanistan; intervened, more modestly, in Libya; and conducted drone campaigns in Pakistan, Yemen, and Somalia. This is not the place to debate the wisdom of these efforts, either individually or as a group. But we must acknowledge their cost. These military operations—particularly those in Iraq and Afghanistan—have exacted a heavy human and financial cost in terms of thousands of lives lost and trillions of dollars expended; they have left us strategically overextended; they have wearied the American public; and, in some instances, they have given rise to unintended consequences injurious to U.S. national interests. (The chief strategic beneficiary of our invasion of Iraq, for instance, was arguably Iran.)

Our combat involvement in Iraq is mercifully behind us. The Obama administration should place a high priority on achieving a similar outcome in Afghanistan. Our large military presence there has long outlived whatever strategic rationale it might once have possessed.

In addition, the administration should carefully assess our ongoing drone campaign. It has no doubt reaped benefits in our efforts to neutralize terrorist threats. But it has also created a backlash among the affected populations, the results of which may take years to become clear.

Finally, the administration should be very careful—very careful, indeed—about approving a strike against Iran’s nuclear facilities. It would be truly tragic were we to end our entanglements in Iraq and Afghanistan only to embark on a policy of military confrontation with Iran of unknown duration and unforeseeable consequences.

Recommendation 3: Reassess our role in the Israeli–Palestinian peace process

The Arab–Israeli dispute has bedeviled U.S. policymakers for a half-century. For the last 20 years, we have repeatedly tried—and repeatedly failed—to broker a lasting settlement between Israelis and Palestinians. It may well be that the window of opportunity for a two-state solution has already closed. Settlements in the West Bank are now so extensive and politically sensitive in Israel that a viable Palestinian state may no longer be possible. Indeed, we might be entering a period during which both Palestinians and Israelis will be forced to acknowledge a future where the peace process as we know it is obsolete.

Even if a two-state solution is still within theoretical grasp, the current facts on the ground are not promising. Palestinians remain hopelessly divided. The ongoing expansion of settlements in the West Bank makes it increasingly difficult for any Israeli government to compromise. We need to reassess our long-standing step-by-step approach to the peace process, which has permitted extremists on both sides to scuttle negotiations. If the president chooses to make brokering an agreement between Israelis and Palestinians one of his top priorities, he must be prepared to take an active role in developing the details of a settlement, exacting the concessions from both parties necessary to reach it, and moving rapidly toward final status negotiations. Above all, he will have to overcome

strong domestic opposition to any pressure on Israel. Whatever he does, the president must be careful about making promises that he cannot deliver. When it comes to the peace process, a half-hearted effort is often worse than no effort at all.

Recommendation 4: Take a low-key approach to the “Arab Spring”

The so-called “Arab Spring” is a historic event of complex origins, ambiguous course, and unknown future outcomes. Above all, it is an Arab phenomenon that will be driven by Arab elites and populaces. More democratic government in the Middle East may, at least in the short- and medium-term, adversely affect our other interests in the region. Moreover, our ability to control events in the Arab world is severely constrained. Our general support for democracy must be tempered by our very specific interests in the region, above all the maintenance of peace between Egypt and Israel and the stable supply of oil to world markets. Again, it would be wise to restrain our rhetoric. In any case, clarion calls in support of democracy in the Middle East will ring hollow with Arab populations who are aware of our long—and continuing—support for autocrats in the region.

Recommendation 5: Further reduce our military profile in Europe

The ongoing Eurozone crisis should not blind us to a fundamental strategic truth: Europe is safer today than ever before. The idea of war between countries of the EU is unimaginable; the prospect of military conflict between Russia and members of NATO is far-fetched. There is no compelling strategic reason to maintain a significant U.S. military presence in the region. That presence has been declining since the end of the Cold War; it should be reduced further.

Recommendation 6: Avoid unnecessary confrontation with Russia

It is important not to overstate the threat Moscow poses. Russia today remains a pale shadow of the once-great Soviet Union. It still possesses a substantial nuclear arsenal. Its conventional military capabilities may be sufficient to threaten its smaller neighbors. But the Russian military represents little strategic challenge to the United States and our NATO allies in Europe. Russia's huge production of oil and gas gives it clout in international energy markets. But even this influence may wane with increased production of shale oil and gas in other regions, notably North America. The bottom line: except for its nuclear weaponry and vast hydrocarbon resources, Russia would be a middling power at best.

Moscow's relations with some states of the former Soviet Union—notably Ukraine, and especially Georgia—have been troubled. Extending immediate NATO membership to them would prompt a sharp reaction from Moscow; more importantly, it could also draw the United States into military confrontation. The Russo-Georgian War of 2008 illustrates this risk. Whatever the merits of Georgia's case against Russia for Moscow's support of

the breakaway regions of Abkhazia and South Ossetia, the recklessness of the Georgian government created an excuse for a Russian military counterstrike. Article V of the North Atlantic Treaty—which binds members to aid each other in the event of an attack—is a solemn and consequential undertaking. We cannot take it lightly. Is the United States really prepared to go to war with Russia should conflict again break out between it and Georgia? A “go slow” approach to NATO membership for Georgia and Ukraine would minimize the risk of finding ourselves drawn into disputes of modest strategic import. Such an approach would also find support among other NATO members, notably Germany.

Conclusion

We realize that we have not addressed important regions such as Latin America and Africa. Nor have we discussed—except in passing—critical issues like trade, terror, and nonproliferation. We are not suggesting that the president ignore them. But it is vital that he prioritize his efforts as president. A grand strategy is, above all, about making choices in a world where presidential capital and U.S. influence are both finite. “All of the above” is not a suitable answer to the question “Where should the president of the United States focus his foreign policy?” It is an open invitation to strategic incoherence and, ultimately, passivity as he finds himself drawn in a hundred directions.

Interventionists—both liberal and conservative—will no doubt decry our strategy as a retreat from our special place in world affairs. Isolationists of the Right and Left will, with equal certainty, assail it for asserting a continuing leadership role for the United States.

In particular, the president will be criticized for abandoning the long-standing U.S. commitment to promoting democracy and protecting human rights. Nothing could be further from the truth. We are merely suggesting that he place our values within the context of our other interests. Indeed, the strategy we support reaches back to the very early days of the Republic. John Quincy Adams, then secretary of state to President James Monroe, summed up our position eloquently in a July 4, 1821, address to the U.S. House of Representatives. (We retain original spelling.)

“Whenever the standard of freedom and independence has been or shall be unfurled, there will be America’s heart, her benedictions and her prayers. But she does not go abroad in search of monsters to destroy. She is the well-wisher to freedom and independence for all. She is the champion and vindicator only of her own. She well knows that by once enlisting other banners of foreign independence, she would involve herself beyond the power of extridition, in all wars of interest and intrigue, of individual avarice, envy and ambition which assume the colors and usurp the standard of freedom ... She might become the distress of the world but would no longer be ruler of her own spirit ... Americans should not go abroad to slay dragons they do not understand in the name of spreading democracy.”

We believe that a balancing strategy, if properly explained and competently implemented, will find wide support from an American public that is weary of endless war but well aware that we cannot simply withdraw from world affairs. This is particularly true today, as we confront a sluggish economy and a looming debt crisis. There is a real risk that the American public will in time turn away from U.S. engagement abroad. A balancing strategy will help avert this possibility by reducing unnecessary commitments and focusing foreign policy on our truly vital national interests: the security of our citizens and their economic well-being.

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Information Technology Policy: Action Items for the Next Four Years

by Christopher Bronk, Ph.D.

Overview

In his bid for re-election in 1996, President Bill Clinton clearly identified the need to build a bridge to the next century, largely through investment in information technology (IT). Today, the U.S. innovation economy is generally synonymous with activity undertaken in California's Silicon Valley—an innovation center that is the envy of the world. The policy prescriptions in this paper largely ask how IT may confront the broad array of problems faced by the country. Eight recommendations are made on the themes of computation and jobs, cyberespionage, the militarization of cyberspace, resilient and intelligent infrastructures, digital diplomacy, and fostering innovation. This report is a very high-level overview of IT policy issues, but one that embraces the idea that highly detailed and nuanced policy directions are needed in national security, energy, health care, education, and foreign policy. The United States remains the global leader in computing, and it should be the administration's goal to enact public policy that preserves this leadership position for as long as possible.

- **Recommendation 1:** Through its national counterintelligence mandate, the administration must develop deeper collaborations with industry in the protection of key intellectual property and systems against efforts to purloin data via cyber means.
- **Recommendation 2:** The administration should reconsider its policy of offensive cyberattacks as covert action, as well as produce clear, public doctrine on U.S. intent regarding the use of force in cyberspace and guidance on U.S. options for response in the event of a cyberattack producing kinetic outcomes against the nation or its interests.
- **Recommendation 3:** The administration should embrace collective security strategies of cyberdefense with its allies and move to restore U.S. national leadership in the multi-stakeholder governance effort that manages the evolution and growth of cyberspace.
- **Recommendation 4:** Invest in further research on distributed electricity generation, resilient electricity delivery, and, where necessary, increased security for the distribution system for electricity designed to protect U.S. economic output.
- **Recommendation 5:** Work with critical infrastructure stakeholders to develop resilient architectures and systems, which have as core design components broad redundancy and capacity to withstand disruption by physical and cyber means.

- **Recommendation 6:** Work to protect a highly inclusive set of Internet governance activities that embraces technologists, industry, and members of civil society rather than shifting Internet governance entirely to an agency falling under the umbrella of the United Nations.
- **Recommendation 7:** Continue to embrace Internet-based technologies in fostering dialogue with the more than 2 billion Internet users on the planet, allowing for maximum responsibility for those foreign affairs professionals engaged in those communications.
- **Recommendation 8:** Continue, wherever possible, to preserve research funding outlays for both basic and applied science in computing, as this contributes to national competitiveness through innovation.

Background

Four years ago, interest in information technologies as a major issue for policy remained comparatively low on the Washington agenda. Moreover, most recommendations on IT policy made to the Obama transition team were focused on government management issues, such as the creation of federal chief intelligence officer and chief technology officer positions, and also as part of the broader agenda of science and technology policy. At the beginning of the second Obama administration, recommendations must acknowledge the fundamental shift in how IT is shaping economics, geopolitics, and virtually all aspects of public policy. IT mattered a great deal in 2008; in 2012, IT matters a great deal more.

This paper divides IT issues between those that would seem to fall primarily in the area of domestic policy and those landing in foreign affairs. There is one significant caveat, however, that must be addressed, and that is the enormous degree of global interconnectivity between the United States and virtually every country on the planet. The pace of dissemination for information technologies is simply staggering. We are approaching a point at which the number of mobile phones on the planet equals the number of people on it. Furthermore, more than a billion of those phones provide some degree of connectivity to the Internet. And that number—one billion—is also the number of subscribers to the Facebook social network. If it were a country, Facebook would be the world's third largest after China and India. Never before has commerce, news, and culture moved so far so fast.

The fundamental problems and prospects for the United States in the next four years can no doubt produce a long list. Slow job growth, rising federal debt, and ongoing military operations loom large as issues for the U.S. government. However, when we look for strengths in the United States, the IT sector stands as a significant driver of economic growth fueled by innovation. But IT is not only a catalyst for economic growth and productivity, it is also restructuring our entire economy, from entertainment to health care to our foreign policy and national security. More than ever before, IT is embedded in our policy issues and the prescriptions we craft for them.

Computation and Jobs

In a meeting with the late Steve Jobs, founder of Apple Inc., President Barack Obama asked how or when Apple could bring manufacturing positions back to the United States from its overseas operations, primarily in China. “Those jobs aren’t coming back, Mr. President,” he is reputed to have answered. But those jobs may not be staying in China forever, either. Foxconn, the manufacturing subcontractor for Apple’s iPad and iPhone production lines, is already investigating how it can replace its workers with robots. We have witnessed how technological change renders entire categories of work obsolete. This is often summarized as the creative destruction identified by economist Joseph Schumpeter, although with the sunny prognostication that new jobs will be created.

Today, the United States’ future economic well-being hinges upon the creation of new jobs. However, we are left to wonder what new sorts of work will emerge from our time, an era of increasingly smart machines. Erik Brynjolfsson and Andrew McAfee noted last year that “technological progress is accelerating innovation even as it leaves many types of workers behind.” Innovation from Silicon Valley continues to produce enormous wealth: Consider the startup Instagram, which went from an idea to a \$1 billion acquisition within 18 months of its founding, and which employed fewer than 20 people when it was bought. No doubt, American entrepreneurs are still coming up with incredible innovations, but those innovations are not leading to new areas of substantial employment. We have a society that must increasingly wonder what jobs may be performed by algorithms and, therefore, replaced by computers.

While there is no prescription for government offered here, the issue of computing and how it is impacting the employment picture deserves mention nonetheless. The 1990s U.S. economic boom was in some part a byproduct of the Internet and IT finding their place in American business, nearly a decade after economist Robert Solow opined, “You can see the computer age everywhere but in the productivity statistics.” Today, big data is ubiquitous, but we are left to wonder where it will create jobs for American workers.

Cyberespionage

The economic prosperity of the United States is linked to its capacity to protect intellectual property (IP) theft by cyber means. Gen. Keith Alexander, chief of the National Security Agency, has labeled efforts by foreign entities to purloin proprietary information of U.S. firms “the greatest transfer of wealth in history.” Foreign intelligence services and companies are able to utilize cyberspace and the digitally interconnected topography of the contemporary global corporation to gain access to sensitive communications, documentation, and research and development (R&D) products. The target of industrial espionage is not only the CEO or his administrative assistant, but also their smart phones and email accounts.

The simple answer to this problem is that U.S. firms need to think much more comprehensively in their cyber counterintelligence capabilities. Beyond developing their own intrinsic capacity to thwart cyberespionage, countermeasures need to become far more of a team effort, and not one solely aimed at producing technological countermeasures. We suggest the following:

Recommendation 1: The administration, through its national counterintelligence mandate, must develop deeper collaborations with industry in the protection of key intellectual property and systems against efforts to purloin data via cyber means. This will require the sharing of intelligence, dedication of R&D resources, and protection of corporate data from public disclosure.

The Militarization of Cyberspace

While cyberespionage is a significant obstacle to U.S. economic development, the possibility of cyberconflict looms more real with each new piece of sophisticated malware detected by computer security labs in Moscow, Atlanta, or Cambridge. The United States has been reluctant to clearly state its military objectives and concerns in cyberspace, which it has labeled a distinct military domain standing on par with land, sea, air, and space. This is understandable, as cyberspace allows the Department of Defense (DoD) to mount synchronized military operations across vast distances with minimal delay or friction. The Internet is likely the most important system of systems ever created by the DoD in pursuit of its national security missions and mandates.

The emergence of the Stuxnet malware and information regarding cyberattacks against the nuclear enrichment infrastructure of Iran indicate that the United States has likely crossed the Rubicon into the use of clandestine cyberattacks to produce kinetic results (i.e., damage to enrichment centrifuges). What the U.S. and its allies will likely face now is cyberattacks designed to damage their economic and geopolitical interests. Foreshadowing this problem was the significant outage of computer systems at Saudi Aramco in August 2012. If undertaken by the U.S. government, was Stuxnet worth it? Time will tell, but before Stuxnet, we only hypothesized about cyberattacks with physical impacts—something that is now a distinct possibility.

Recommendation 2: The administration should reconsider its policy of offensive cyberattacks as covert action, as well as produce clear, public doctrine on U.S. intent regarding the use of force in cyberspace and guidance on U.S. options for response in the event of a cyberattack producing kinetic outcomes against the nation or its interests.

Recommendation 3: The administration should embrace collective security strategies of cyberdefense with its allies and move to restore U.S. national leadership in the multi-stakeholder governance effort that manages the evolution and growth of cyberspace.

Resilient and Intelligent Infrastructures

Discussion on cybersecurity issues frequently comes with consideration of how components of the national critical infrastructure may be vulnerable to cyberattack. How systems delivering electricity, fuel, and water are modernized by employing networked computing resources is of concern, no doubt, but there are deeper questions of how current U.S. infrastructure is able to cope with evolving needs, rising population, and the digital economy. This discussion typically rises to the top of the agenda when disruption occurs.

Perhaps most worrisome today is a disruption to electricity delivery. The Electric Power Research Institute Inc. estimates that power disturbances across all business sectors cost between \$104 and \$164 billion per year, a figure roughly equal to the total gross domestic product of Slovakia.¹ Hurricane Sandy is only the most recent massive storm to disrupt electrical service to millions. Without electricity, the digital economy screeches to a grinding halt. SmartGrid technologies aim to build resilience into electrical distribution; however, response to massive outages produced by natural phenomena remains excruciatingly slow for affected customers. Attention is required to better protect the electrical distribution system from weather-related, usage-based, and cyber-related disruption. Dedication of significant resources to develop damage-avoidance safeguards and more rapid repair for the electricity grid would be a wise investment.

Recommendation 4: The administration should invest in further research on distributed electricity generation, resilient electricity delivery, and, where necessary, increased security for the distribution system for electricity designed to protect U.S. economic output.

Recommendation 5: The administration should work with critical infrastructure stakeholders to develop resilient architectures and systems, which have as core design components broad redundancy and capacity to withstand disruption by physical and cyber means.

Digital Diplomacy

One of the enduring images of the Arab Spring remains a banner from Tahrir Square that reads, “We Want Internet.” Under the direction of Secretary Hillary Clinton, the State Department has incorporated many of the latest Silicon Valley innovations—Facebook, Twitter, and Google’s YouTube chief among them—to facilitate global outreach. Social media has allowed U.S. diplomats to engage with foreign publics on a personal level, despite the increasingly fortified physical presence of overseas diplomatic missions.

Beyond this engagement there is the entire issue of how the Internet should be managed. The United States will be increasingly dogged by efforts to shift the governance of cyberspace from the multi-stakeholder arrangement undertaken by the Internet Corporation for Assigned Names and Numbers, the Internet Engineering Task Force, and the Internet Governance Forum. The government should resist such change and be wary

of information security issues (which focus on information content) forwarded by Russia, China, and other states desiring a greater degree of ideological insulation.

Recommendation 6: The administration should work to protect a highly inclusive set of Internet governance activities that embraces technologists, industry, and members of civil society rather than shifting Internet governance entirely to an agency falling under the umbrella of the United Nations.

Recommendation 7: The administration should continue to embrace Internet-based technologies in fostering dialogue with the more than 2 billion Internet users on the planet, allowing for maximum responsibility for those foreign affairs professionals engaged in those communications.

Fostering Innovation

This set of guidelines began with the sounding of a caution regarding the manner in which computational innovation is changing the landscape of work. Despite this concern, however, the U.S. government should continue to invest in computational research, from basic research that stands as the foundational pillars of the discipline to applied research aimed at servicing inquiry in other disciplines.

The United States still holds the lead in design and production of a sizable set of computing technologies, including the fundamentally important microprocessor sector. Ensuring that leadership requires continued government funding in mathematics, electrical engineering, and computer science. In addition, computational research is increasingly relevant in interdisciplinary projects, such as bioinformatics and high-performance computing for energy. While it no doubt sounds self-serving of a university-based research think tank to advocate for research funding in academia, such research is the basis for U.S. leadership in high-technology sectors and, thus, economic strength.

Recommendation 8: The administration should continue, wherever possible, to preserve research funding outlays for both basic and applied science in computing, as this contributes to national competitiveness through innovation.

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Moving Forward with Tax Reform

by John W. Diamond, Ph.D., and George R. Zodrow, Ph.D.

Overview

The past five years have seen renewed interest in fundamental reform of our nation’s corporate and personal income tax system. This interest has been prompted by a variety of factors. There is widespread recognition that the current U.S. income tax system is a complex, highly inefficient, and costly way of raising revenues to finance government expenditures. In addition, the temporary nature of the current tax system is problematic because it interferes with individuals’ and businesses’ ability to make decisions, and creates the potential for a fiscal contraction at a time when the economy is fragile, thus increasing the probability of an economic recession in the near term. Furthermore, the potential for an automatic increase in taxes is slated to coincide with large reductions in spending aimed at reducing the deficit, which together are widely viewed as a poorly timed, contractionary fiscal policy path. Beyond these concerns, the reports of several bipartisan commissions focusing on deficit and debt reduction—including the report of the National Commission on Fiscal Responsibility and Reform and the alternative proposed by the Bipartisan Policy Center’s Debt Reduction Task Force (the Rivlin–Domenici Plan)—have highlighted the need to reform the income tax system. In particular, these reports recognize that additional income tax revenues are almost assuredly going to have to play some role in solving our nation’s looming fiscal problems—even if this role is secondary to spending reductions and cost-saving reforms of the Social Security, Medicare, and Medicaid programs. Additionally, President Barack Obama stressed the need for fundamental tax reform in his 2011 State of the Union address; the House and Ways and Means Committee is holding hearings on the topic; and several comprehensive blueprints for income tax reform were described in the 2005 report of the President’s Advisory Panel on Federal Tax Reform.

- **Recommendation 1:** Satisfy the following criteria for evaluating fundamental tax reform packages: revenue neutrality, distributional neutrality and horizontal equity, simplicity, economic efficiency and tax neutrality, and a favorable environment for foreign investment.
- **Recommendation 2:** Institute base broadening, rate-reducing tax reforms for individuals and businesses.
- **Recommendation 3:** Give serious consideration to the implementation of an “allowance for corporate equity.”

Recommendation 1: Satisfy the following criteria for evaluating fundamental tax reform packages: revenue neutrality, distributional neutrality and horizontal equity, simplicity, economic efficiency and tax neutrality, and a favorable environment for foreign investment.

Numerous criteria might be utilized to evaluate proposals for fundamental tax reform. However, we would argue that any viable reform proposal must satisfy at least the following five criteria.

Revenue Neutrality

We believe that fundamental reform of the income tax structure is sufficiently difficult that the process of reform should not be encumbered by a requirement to raise additional revenues, which would ensure that many, if not most, taxpayers would end up being “losers” from reform, making the passage of reform virtually impossible from a political perspective. Although we understand that additional revenues will be needed in the future to address our nation’s deficit and debt problems as well as eliminate the Alternative Minimum Tax (AMT), we believe that raising rates within a reformed tax structure to obtain additional revenues, in conjunction with spending cuts as part of a sweeping fiscal reform package, must be treated as a separate issue if fundamental tax reform is to be politically feasible. Moreover, we believe that such treatment should be extended to the AMT and the Bush tax cuts; that is, we propose that the revenue (and distributional) baselines for fundamental tax reform assume that the AMT patches and the Bush tax cuts will be permanently extended. Thus, we propose a two-stage approach to reform—a revenue-neutral fundamental tax reform under the assumptions outlined above, followed by fiscal reform that reduces future budget deficits while reaching a compromise on distributional issues.

We would also like to emphasize that fundamental tax reform should not be held hostage to those who argue that the implementation of a more efficient and simplified broad-based income tax system is undesirable because it might facilitate greater growth in the size of government. Decisions regarding the size and scope of government must be left to the political process, and a host of instruments, including the use of budget rules to limit expansions of the size of government, are available to reduce current deficits. But perpetuating a highly inefficient and complex tax system in the hopes that it might limit the growth of government strikes us as an extremely costly and highly inappropriate way of achieving that goal.

Note also that revenue neutrality must be defined broadly to include long-run neutrality. This ensures that the long-run implications of provisions that accelerate revenues (e.g., conversion of retirement savings from traditional IRAs and similar accounts to Roth IRAs) are fully taken into account. At the same time, we believe that the definition of revenue neutrality, especially in the long run, should be broad enough to take into account conservative estimates of the dynamic revenue effects of reform-induced increases (or decreases) in economic growth.

Equity: Distributional Neutrality and Horizontal Equity

Following the approach that was successful in the passage of the Tax Reform Act of 1986 (TRA86), we believe that tax reform should be approximately distributionally neutral (using the revenue baseline described above). As in the case of revenue neutrality, fundamental tax reform is difficult enough from a political perspective without complicating matters further by attempting to redistribute the tax burden across income classes.

We also stress that another dimension of equity—the equal treatment of households with similar taxpaying capacity or horizontal equity—should guide all proposals for fundamental tax reform, as it did in TRA86 and as recommended by virtually all public finance specialists. Note that the implications of adopting horizontal equity as a prime criterion for evaluating reform proposals are far-reaching. In particular, as discussed further below, it implies that all forms of compensation, including currently untaxed fringe benefits, should be included in the tax base to the extent administratively feasible.

Simplicity

Tax simplicity is often emphasized in early discussions of fundamental tax reform, but is usually largely ignored as the process of tax reform unfolds. We believe that simplification should be advanced as an essential criterion for any current reform of the tax system. While we recognize that some tax complexity is unavoidable in measuring income accurately in today's complex economy, we nevertheless believe that there are many areas in which the tax code could be simplified significantly without seriously compromising accurate income measurement. For example, in the taxation of capital income, we are comfortable with ad hoc adjustments for inflation that assume the Federal Reserve Board is successful in achieving its goal of maintaining inflation at around a 2 percent rate, rather than an elaborate system of comprehensive inflation indexing. More generally, we support the simplification measures recommended in the 2005 Tax Panel report, including simplifying and coordinating various individual income tax credits such as the standard deduction, personal exemptions, and the earned income tax credit; collapsing the current wide array of saving and investment incentives into a very small number of simplified plans; simplifying business accounting rules, especially for small businesses and in the area of depreciation allowances; and eventually eliminating the alternative minimum tax.

Economic Efficiency and Tax Neutrality

An essential element of any successful tax reform proposal is the elimination of tax-induced distortions of economic decision-making (other than in a few very narrowly defined activities with widespread economic effects, such as investment in research and development and the emission of pollutants). As stressed in the debate surrounding TRA86, the government should, in general, not be engaged in an implicit industrial policy by distorting investment decisions through differential tax treatment of various investment activities and business sectors, and similarly should avoid distorting individual consumption decisions. We recognize that, from a theoretical perspective, economic efficiency can require differential tax rates. However, we believe that, in

practice, when one tempers efficiency considerations with equity concerns and takes into account the economic difficulties in determining an optimally differentiated tax structure as well as the political and administrative problems of implementing it successfully, simple economic neutrality—uniform tax rates on similar activities in the context of broad-based, low-rate taxes—is a reasonable approximation to an efficient tax structure. Accordingly, we believe that economic neutrality should be a key guiding principle in the formulation of any fundamental tax reform proposal. This in turn has several implications.

Most fundamentally, the general approach to reform should follow the traditional path used in TRA86 of eliminating as many tax preferences as is politically feasible and using the resulting revenues to drastically lower marginal tax rates. In our view, this implies that the elimination of many preferences that have long been considered sacrosanct, even those not touched in TRA86, should be considered seriously. Note that such reforms are desirable on efficiency, equity, and simplicity grounds, and also to limit government expenditures that occur through the tax system and are thus subject to less scrutiny than direct expenditures. Moreover, many tax preferences are poorly designed in any case. The home mortgage interest deduction, discussed further below, is an excellent example. Although its primary purpose is to encourage home ownership over renting, it is very poorly designed to achieve this goal as it offers little or nothing to low- and middle-income individuals who do not itemize, have total deductions that are less than or roughly equal to the standard deduction, or are subject to relatively low marginal tax rates. Instead, the vast majority of the benefits of the home mortgage interest deduction accrue to high-income taxpayers, encouraging overconsumption of housing at the expense of less investment in the rest of the economy.

In addition, neutral tax treatment should also be applied to saving decisions; that is, current consumption should not be favored over future consumption. In principle, this implies the tax base should be consumption rather than income. Although we believe that replacement of the income tax with a full-fledged, consumption-based tax is not feasible at the current time, current personal income tax provisions that encourage saving should be maintained (although they should be simplified, along the lines described previously), and serious consideration should be given to reducing the burden of the corporate income tax on investment income.

Favorable Environment for Foreign Investment

Finally, we believe that in today's globalized economy, the income tax system in the U.S. should not put our multinational companies at a disadvantage relative to competing firms based in other countries, and at the same time should discourage tax evasion and tax avoidance, especially in the form of income shifting to low-tax countries. In particular, the tax system should not discourage foreign investment by U.S. multinationals, and should not discourage investment in the U.S. by foreign multinationals. Although a full discussion of the intricacies of the tax treatment of foreign investment is far beyond the scope of this article, we note that (1) in order to make investing in the U.S. attractive to foreign multinationals, the taxation of capital income in the U.S. should be concentrated at the individual level; (2) the "territorial" system advocated in the "Simplified Income

Tax” proposed by the 2005 Tax Panel has the advantage of putting U.S. multinationals on an equal footing with most of their competitors, but exacerbates incentives for shifting income abroad and requires complex allocations of U.S. costs across domestic and foreign activities; (3) any approach that instead increases the inclusion of foreign income in the tax base of U.S. firms (e.g., the elimination of deferral) should be accompanied by corporate income tax rate reductions that would leave effective tax rates approximately constant; and (4) another advantage of low statutory rates under the corporate income tax is that they reduce incentives for income shifting to other countries with relatively low tax rates.

Recommendation 2: Institute base broadening, rate-reducing tax reforms for individuals and businesses

Base-Broadening, Rate-Reducing Individual Tax Reforms

We propose an individual tax reform that would substantially reduce or eliminate many tax credits, deductions, and exemptions while consolidating and simplifying other tax preferences—that is, a base-broadening, rate-reducing (BBRR) reform similar to TRA86. TRA86 broadened the tax base by eliminating the exclusion for long-term capital gains, the investment tax credit, the deduction for two-earner families, income averaging, the deduction for state and local sales taxes, and the deduction for interest on consumer loans including credit card interest. It also limited deductions for depreciation, passive activity losses, business meals and entertainment, and medical expenses, and expanded the AMT to include deductions utilized by most households. Much of the resulting revenues were used to reduce rates, although standard deductions and personal exemptions were also increased significantly. However, TRA86 did not limit or eliminate the home mortgage interest deduction, the deduction for employer-provided health insurance, the deductions for state and local income and property taxes, the deduction for charitable contributions, or the exemption of interest on public-purpose state and local bonds.

Under current law, home mortgage interest deductions are allowed for interest payments on up to \$1.1 million in mortgage principal on first and second mortgages on residences, including home equity loans. While completely eliminating the mortgage interest deduction is often deemed politically infeasible, there are several options for reducing its magnitude. We propose a combination of reducing the cap on the amount of mortgage principal on which interest receives a tax preference, coupled with either (1) deductibility of only a fraction of home mortgage interest, or (2) a fixed-rate, non-refundable tax credit for home mortgage interest. If deemed necessary to allow time for further recovery of the housing market, these provisions could be enacted with a delayed effective date.

Ending the deduction for employer-provided health insurance has been widely discussed. In 1986, this idea was rejected at least in part because it would reduce reliance on employer-provided health benefits and thus increase the pressure to implement government-funded health insurance. Although the health care reform bill was recently passed, this issue will likely continue to be a point of contention in the debate about the tax treatment of employer-provided health insurance. We propose to cap the deduction

for employer-provided health insurance, and then to gradually allow it effectively to shrink by indexing the cap only to general inflation (rather than to the inflation in health care costs). This would raise revenues over time and allow for a longer and smoother transition from current policy.

The deduction for state and local taxes reduces the effective price for state and local services for individuals who itemize. Many observers, including the 2005 Tax Panel, have argued that state and local taxes approximate payments for public services received and thus reflect consumption expenditures that should not be deductible; moreover, to the extent such services do not provide significant national spillovers, deductibility encourages overprovision of state and local public services. In addition, the deduction is regressive because it increases in value with the tax rate and is thus positively related to income, and is available only to itemizers. We propose full repeal of the deduction for state and local taxes under the personal income tax on the grounds that most state and local expenditures approximate consumption expenditures and do not have significant national spillovers. Similarly, the tax exemption for interest on public purpose state and local bonds encourages overconsumption of state and local services to the extent that they do not generate national externalities and creates a tax bias favoring debt finance. We propose that this exemption be eliminated for new state and local bonds (existing bonds would be grandfathered). We recognize that direct federal expenditures would have to increase to provide subsidies to those state and local activities that generate significant national externalities.

The deduction for charitable contributions is often justified on the grounds that the organizations that receive charitable donations produce national external benefits that should be subsidized and that the deduction allows individual choice of the activities supported. We propose to transform the deduction into a nonrefundable fixed-rate credit that can be claimed by all taxpayers that give more than two percent of adjusted gross income.

Individual reform should also limit and restructure the number of benefit provisions for low-income taxpayers and families with children. These provisions include the child tax credit, the earned-income tax credit, the child and dependent care credit, head of household filer status for unmarried taxpayers with dependents, and personal exemptions. We propose consolidating and reducing the various provisions and simplifying the structure of the provisions, along the lines recommended by the 2005 Tax Panel.

Reform should also reduce the number of provisions related to retirement savings and expand the programs to encourage low-income families to save. We propose to simplify the current system by reducing the number of options to no more than two or three programs, again following the lead of the 2005 Tax Panel, and to expand the low-income savers credit to allow low-income savers to better plan for retirement.

A BBRR individual tax reform that eliminates most tax expenditures and uses that revenue to reduce tax rates, expands incentives to save, and simplifies the tax code would be a critical first step toward fiscal responsibility, balancing the need for revenue, minimizing the efficiency costs of taxation, and achieving an equitable tax system.

Business Tax Reforms

We also propose a traditional BBRR reform of the corporate income tax that would eliminate as many tax preferences as politically feasible and use the resulting revenues to lower the corporate tax rate, along the lines of the reforms accomplished in TRA86. As stressed above, a BBRR reform of the corporate income tax would, in general, be highly desirable. In particular, such a reform would reduce costly distortions of economic decisions and thus promote economic growth and efficiency in resource allocation; simplify tax administration and compliance; reduce incentives for tax evasion and tax avoidance, including incentives for income shifting abroad by U.S. multinationals; and create a fairer tax system.

The primary objection to such a reform, which was also voiced during the debate surrounding TRA86, is that a BBRR reform is not well-targeted toward new investment, and instead confers much of its benefit to existing capital and to investments that earn above-normal economic profits. Critics of the BBRR approach argue that maintaining a high statutory tax rate on all investments, including existing investments and those that are highly profitable—coupled with the introduction of investment incentives such as an investment tax credit or more accelerated depreciation allowances (including partial expensing) that apply only to new investment—is a less costly, better targeted, and thus preferable approach.

Although this argument has some merit, it must be qualified in several ways. Most importantly, a lower statutory rate under the BBRR approach reduces incentives for income shifting by U.S. multinationals (through the use of transfer pricing, debt reallocation, the relocation of patents and other intangible assets, and similar activities), which is a significant factor, given the accumulating empirical evidence which suggests this is currently a serious problem. In addition, rate reduction will attract investments by both U.S. and foreign multinationals that generate above-normal profits, which in turn will contribute to revenues. In our view, these arguments, when coupled with the traditional case for BBRR reforms, make a compelling case for following this traditional approach to fundamental tax reform.

With respect to identifying potential base-broadeners or tax preferences that should be eliminated and used to finance rate reduction, a comprehensive list is provided in the U.S. Treasury's 2007 report on improving the competitiveness of the business income tax system. The most important items are accelerated depreciation allowances, the special deduction for U.S. manufacturing activities, and the research and experimentation credit (which arguably should be maintained for the reasons discussed above). In addition, the report lists many other tax preferences that are potential base broadeners. Note, however, that these should not include eliminating deductibility of state and local taxes paid by

businesses, even though this was recommended by the 2005 Tax Panel report; such taxes represent a cost of doing business (even if they are direct payments for public services received) and should be deductible.

Recommendation 3: Give serious consideration to the implementation of an “allowance for corporate equity.”

We close by mentioning a more ambitious and economically sound—but politically more difficult—potential additional element of fundamental tax reform. Although the BBRR approach outlined above has many advantages, our proposed reform—like TRA86—would neither eliminate the tax bias favoring debt finance under the current income tax (which arises because interest on debt is deductible but dividends paid to shareholders are not), nor would it reduce the overall level of investment disincentives under the current corporate tax. Accordingly, we believe that as part of the process of fundamental tax reform, serious consideration should be given to the implementation of an “allowance for corporate equity” (ACE) that would result in roughly uniform treatment of debt and equity finance and lower the taxation of investment income at the business level to that associated with a consumption-based tax. This approach, which was recommended recently by the tax reform commission headed by Nobel Prize-winning economist James Mirrlees in the United Kingdom and has been implemented successfully in a small number of countries, allows firms an extra deduction equal to the product of the book value of equity capital and a risk-free nominal interest rate. The economic effect of the ACE is to put debt and equity finance on an equal footing at the business level, as the ACE deduction for equity-financed investment is comparable to the deduction of interest expense for debt-financed investment. Moreover, the ACE approach can be applied to all businesses, perhaps with an exception for small firms, and thus would eliminate the current income tax bias against corporate entities.

Relative to the much more commonly discussed option of expensing, the ACE has many advantages as a means of implementing a consumption-based business tax. Most importantly, firms continue to deduct depreciation and interest expense as under the current income tax system, in comparison to expensing interest deductions being disallowed to avoid negative effective tax rates (the Flat Tax provides for such treatment). The ACE plan thus looks much like the current system, which implies it raises relatively minor transitional issues; moreover, the ACE deduction can be limited to new investment to reduce the revenue losses associated with its implementation. In addition, (1) the short-run revenue loss under the ACE is considerably smaller than with expensing; (2) fewer firms are in a loss position under the ACE than with expensing, avoiding the problematic issues that arise with negative tax bases; (3) financial institutions are taxed like all other firms (they are exempt under the flat tax); (4) because depreciation deductions, interest deductions, and the allowance for corporate equity are taken each year (in contrast to expensing which occurs only in the year of investment), changes in future tax rates do not affect investment decisions as they do with expensing; and (5) the ACE system results in relatively accurate income measurement, as any error in

depreciation accounting or in the implicit inflation adjustment for a capital asset due to accelerated depreciation is offset by an equal and opposite error in the calculation of the allowance for corporate equity.

The ACE would of course cost revenue. Since we believe that taxes at the corporate level should be kept low to make investment in the U.S. attractive for foreign investors, we believe that this revenue should be recovered with higher individual-level taxes on dividends and capital gains. Although politically difficult, this would also facilitate meeting our goal of maintaining distributional neutrality. The goal should be a tax system that provides roughly uniform treatment of all forms of investment, taking into account both the corporate and individual tax burdens.

Finally, if a move to a full-scale ACE is too costly or too difficult from a political perspective, a partial ACE—that is, a partial deduction of the type described above—could be utilized. Indeed, if deemed desirable, the fraction deductible could even be varied depending on macroeconomic conditions, with the fraction of the ACE deduction permitted to increase during cyclical downturns (we resist the temptation to refer to this plan as the “ACE in the hole”). Such an approach would be far preferable to the current practice which uses partial or full expensing as a counter-cyclical instrument to stimulate investment, since expensing applies equally to both debt and equity financed investments, resulting in subsidies to the former while leaving the tax bias favoring debt intact. By comparison, a partial ACE would lower the tax burden only on equity-financed investment, narrowing the differential between the tax treatment of debt and equity-financed investment while providing an overall stimulus to investment.

Conclusion

Several recent reports on fixing our nation’s fiscal tax crisis have focused attention on the need for fundamental reform of the corporate and personal income tax systems. In this paper, we focus on delineating the general principles that should guide any fundamental tax reform effort; however, we also identify the general outlines of what we believe fundamental reform of both the individual and corporate income tax systems should entail.

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U.S. Economic Diplomacy: Adapting to Shifts in Global Economic Powers

by Russell A. Green, Ph.D.

Overview

International financial markets will undoubtedly remain at the mercy of developments in the Eurozone crisis for at least the first year of the new U.S. presidential term, yet the president will find himself with relatively few levers to influence the outcomes. Hence a productive strategy for U.S. international financial policy would be to shore up defenses against a major crisis, while focusing on longer-term developments, namely the rise of emerging market economies as the dominant sources of global growth over the next several decades. Fostering a cooperative relationship with these rising powers during the next four years will pay dividends for the governance of the international financial system for years to come.

- **Recommendation 1:** Prepare for the worst in Europe.
- **Recommendation 2:** Retain a policy of engagement-as-equals with major emerging economies.
- **Recommendation 3:** Do not label China a “currency manipulator.”
- **Recommendation 4:** Allow a non-American to become the next president of the World Bank.

Background

Globalization of financial markets has advanced even faster than globalization of markets for goods or labor, establishing rapid transmission channels between developments in foreign markets and our own economic health. The most obvious example of this is the potential for the Eurozone to experience a major financial crisis from a disruptive partial breakup of the euro. The evolution of the ongoing crisis in Europe will likely dominate the international financial priorities of the early part of the next U.S. administration, if not the full term, yet the United States plays only a small role in the important decisions that will determine how the current challenges get addressed.¹

While certainly not a foregone conclusion, the possibility exists that the crisis could get much worse, with experts imagining global financial markets freezing up again like they did after the collapse of Lehman Brothers in 2008.² Risk-based capital ratios and leverage ratios in the U.S. banking system have improved since 2008, and direct exposure to southern European financial markets is small.³ Nevertheless, French and German banks

have substantial activity in the United States and key U.S. trading partners, and U.S. banks have indirect exposure to European trouble spots indirectly through exposures to French and German banks.⁴

In the next decade and perhaps beyond, global economic growth will be concentrated primarily in emerging markets.⁵ These countries largely possess underdeveloped financial centers with growing but, at times, tentative linkages to global financial markets. Yet since the financial crisis they have been the largest contributors of additional resources to institutions like the International Monetary Fund (IMF). Unless Europe and Japan are able to execute significant turnarounds, and assuming the United States avoids a debt crisis of its own, the emerging markets will be America's major partners in overseeing the stability and vigor of international financial markets.

Recommendation 1: Prepare for the worst in Europe.

Since U.S. efforts to resolve the financial crisis in Europe constitute largely symbolic involvement, a productive and prudent approach to the problem must include preparation for the potential that a larger disruption occurs. For instance, large portions of post-crisis financial reforms, like implementation of the Dodd-Frank law, remain undone. More difficult measures to understand and supervise cross-border financial activity remain on the agenda of the financial regulatory community.⁶ For instance, harmonization of a cross-border bank resolution to handle the collapse of a bank with significant activity in multiple jurisdictions would prove extremely useful if one of Europe's major international banks required sudden intervention from regulators.⁷

This harmonization work will require significant effort from the United States to quicken the pace, as European regulators are understandably preoccupied. Historically at the G20, at the IMF, in the Basel Committee, or on the Financial Stability Board, most significant international financial reform efforts require prioritization from either the United States or Europe to achieve rapid results.

Recommendation 2: Retain a policy of engagement-as-equals with major emerging economies.

The traditional economic powers of North America, Western Europe, and Japan have controlled the development of the post-World War II international financial system, but economic realities indicate a much broader set of players will wield influence in this century. The United States must adopt a new set of priorities in order to maintain influence and a productive agenda in the governance of finance's global commons.

First, the United States must cultivate common values in the emerging world for market-based approaches to economic policy, including good transparent governance and level playing fields. Most countries—regardless of level of development—turn more naturally than the U.S. to state-centric interventions, and emerging economy institutions may still

be grappling with a legacy of significant rent-seeking behavior. Upward mobility in the populace generally contributes to building a constituency for market-based approaches to economic policy. Inclusive growth must therefore become an important watchword for U.S. international economic policy to bolster popular support for pro-growth initiatives.

Second, the United States must practice skillful economic diplomacy to build coalitions in a more complex power arrangement. This complementary goal requires deepening ties with fast-growing emerging economies to better understand the compulsions of their domestic and external economic policy. Likewise, close interpersonal ties among senior leadership in the U.S. and rising powers facilitates cooperation and conflict resolution.

Both of these necessities suggest a strategy of building bridges with emerging economies in a manner that acknowledges their status at the high table of international financial governance. The United States is well poised to do this, having pursued initiatives like increasing the representation of emerging economies at the IMF for the past 10 years. In addition, the U.S. Treasury Department has launched high-level economic dialogues with China, India, and Brazil, which undertake joint projects, ensure frequent dialogue, and help address conflict areas. Of the 12 countries with a U.S. Treasury attaché, only one is located in a developed country (Brussels).

The financial crisis that centered in U.S. markets in 2008-2009 forced a different, more humble approach to U.S. financial diplomacy. The crisis damaged the U.S. financial system's image as a model for financial liberalization, and U.S. policy accordingly softened to an approach that the leadership of emerging economies found more palatable. For instance, in India and elsewhere Treasury Secretary Timothy Geithner often expressed appreciation for the regulatory conservatism that shielded some emerging economies from the worst impacts of the financial crisis. This was a marked contrast with the often aggressive, occasionally paternalistic strategy practiced in the past of converting developing economies to the gospel of American-style economic success.

Continuing to engage emerging economies as equals will pay dividends in assuring them that the institutions that frame the financial "rules of the game," which often reflect strong U.S. influence, can function in their interest as well. Identifying joint projects where priorities are already aligned, such as the G20 initiative on financial inclusion, also provides opportunities for increased familiarity at the interpersonal level. These connections often prove invaluable when a crisis occurs, as familiarity hastens the coordination necessary for an effective response.

Recommendation 3: Do not label China a "currency manipulator."

Among the working relationships that will prove most important in years to come is the bilateral relationship between the United States and China. Bilateral trade in goods and services amounted to about \$600 billion, or 10 percent of all U.S. trade in 2011. While that trade favored China three-to-one, the future growth of China's domestic market relative

to ours suggests great potential for U.S. exports. Treasury Secretaries John Snow, Henry Paulson, and Timothy Geithner recognized the importance of this bilateral economic relationship and engaged in intensive negotiations with Chinese authorities to address concerns about unfair trade advantages. Aside from specific markets like auto parts or tires, the U.S. primarily focused on exchange rate manipulation and subsidized credit, both of which reflect a highly state-controlled financial system.

Despite the often frustratingly slow pace of progress in reducing either of these factors, the Treasury Department refrained from naming China a currency manipulator. Such an act would draw an immediate response from Congress for remedial measures, risking the beginning of a trade war with our second-largest trade partner. Both previous administrations judged that the resulting damage to the bilateral trade relationship would hurt the U.S. as much as it would hurt China.⁸

The case for restraint has only strengthened in recent months, as the actual evidence of currency manipulation has disappeared. Manipulation refers to a country deliberately keeping its currency low in order to make its products cheaper on international markets. Selling that currency in exchange for another currency pushes the price down, and the other currency gets added into international reserves. So a country's direct currency manipulation can be observed from changes in the levels of international reserves.

In the second quarter of 2012, Chinese reserves fell for the first time, implying the government is not actively suppressing the value of its currency. Since the second half of 2011 Chinese reserve accumulation has been moderate, and the exchange rate has exhibited two-way movement that resembles a somewhat market-determined exchange rate. This is in contrast to the period prior to the global financial crisis, when Chinese reserves rose at a rate of 24-40 percent per year, and market pressure on the exchange rate was exclusively to strengthen.

The trade accounts also reflect dramatic improvement, with a bilateral trade surplus for China of 3.7 percent of Chinese GDP in the year ending Q2 2012. This represents a continuous fall from 9 percent of Chinese GDP reached in the third quarter of 2005. The mirror image from the U.S. standpoint shows the trade deficit as a much smaller share of GDP at 0.5 percent of U.S. GDP in the year ending Q2 2012. This is roughly the same proportion of U.S. GDP as before the financial crisis.

With such little evidence of currency manipulation, naming China a currency manipulator and any ensuing remedial trade measures the U.S. adopts would draw global approbation. Certainly the IMF, ostensibly the objective supra-national arbiter of such matters, would not support the U.S. action. Hence, it would work directly against the second recommendation to cultivate productive relationships among emerging market economies.

Recommendation 4: Allow a non-American to become the next president of the World Bank.

By tradition, the United States selects an American to be the president of the World Bank, Europe selects one of their own to lead the IMF, and Japan selects a Japanese president of the Asian Development Bank (ADB). This tradition looks increasingly archaic as emerging economies take a more prominent place in the global economy. In the case of the ADB, China has even supplanted Japan as the largest shareholder.

With newfound confidence in their rightful role in contributing to the governance of the global financial commons that these International Financial Institutions (IFIs) preside over, emerging markets have insisted that the traditional leadership transition process give way to a more open, competitive, and transparent selection process. When the IMF managing directorship became vacant in May 2011, a non-European candidate became a serious contender against the European candidate for the first time in the history of the institution. Similarly, the World Bank presidency vacancy in the spring of 2012 for the first time presented a true option between the American candidate and a non-American.

Yet, as long as the three beneficiaries of the traditional selection pattern vote in solidarity to preserve the traditional arrangement, contenders will have little hope of breaking in. Emerging markets perceive this as palpable exclusion from access to influence and visible deviation from principles of meritocracy that development banks espouse in their business operations. Furthermore, in current times of investors eagerly seeking investments in farther fringes of “frontier markets” like Kenya and Bangladesh that are prime clients of World Bank international development assistance, supporters of the World Bank increasingly struggle to defend its relevance.⁹ As support—both political and financial—from emerging markets increasingly underpins the legitimacy and potency of the IFIs, this discrepancy is increasingly untenable.

The primary benefit to the U.S. from the traditional arrangement is assuring the World Bank’s leadership shares common values to U.S. leadership. These include commitments to uphold high standards of integrity, and enforcing safeguards for environmental and human rights protection. In addition, World Bank leadership should maintain a focus on serving areas where the private sector is unwilling or incapable of competing. Without pursuit of these priorities the World Bank risks losing support among the U.S. populace, in particular in Congress.

Yet an American president is not the only avenue to achieving an alignment of values. Many of the serious non-American candidates in the recent selection cycles have qualified in this regard. Further, the U.S.-Europe-Japan voting block could still effectively ensure that candidates whose values deviate too far from theirs do not advance. Since the World Bank is an institution that still serves U.S. interests, sacrificing the right to select its president may be required to preserve its relevance.

While relinquishing the presidency may make sensible policy, it should not be given away lightly. First, a U.S. move essentially implies the Europeans and Japanese must do the same, so careful coordination should occur to ensure that they are not caught off guard. But more importantly, this is a valuable bargaining chip, and the administration should ensure that a fair trade occurs. The rising importance of emerging markets suggests a growing list of requests that the United States should make in return.

Conclusion

Preparing for a storm is prudent, and so is preparing for changing seasons. An economic storm coming from across the Atlantic will hopefully not materialize, but the rise of emerging markets is unavoidable. Attention to the financial development needs of emerging economies will pay dividends in terms of building more robust markets for U.S. exports, especially financial services; investing the citizens of the emerging world in like-minded pro-market institutions (literally and figuratively); and fostering cooperation between the U.S. and foreign governments through the pursuit of joint goals.

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Implementing the Affordable Care Act: Recommendations for Realizing Legislative Goals

by Vivian Ho, Ph.D.

Overview

Successful implementation of the Affordable Care Act (ACA) is a crucial challenge that the administration of Barack Obama faces in its second term. The administration will be judged by whether the legislation lives up to its name: making health care in the United States affordable to more Americans. To do so, the country must see substantial increases in rates of health insurance coverage in 2014 and 2015, while slowing the rate of growth in health insurance premiums for those with private insurance. To achieve these goals, we recommend that the administration focus on the following tasks:

- **Recommendation 1:** Use any possible policy levers to encourage states to undertake the Medicaid expansion offered in the Affordable Care Act.
- **Recommendation 2:** Structure health insurance exchanges that facilitate active purchasing in those states that have failed to create their own exchanges.
- **Recommendation 3:** Alter Centers for Medicare & Medicaid Services (CMS) coverage decisions so that only cost-effective technologies are covered.

Background

Rapid and persistent growth in publicly financed health care spending is the most serious threat to the long-term financial strength of the U.S. economy. Total Medicare expenditures reached \$549 billion in 2011, and the program's hospital insurance trust fund is projected to be bankrupt in 2024.¹ The Medicare Trustees Board projects that, under current law, program expenditures will increase in future years at a faster pace than either aggregate workers' earnings or the economy overall. Growth in the public sector is mirrored by rapid increases in private health spending, which is making health insurance unaffordable to many Americans. The average health insurance premium for a family of four is now \$15,745 per year.²

The growth in private medical spending is driven in part by the structure of the Medicare program. Medicare is the single largest purchaser of medical care in the United States. The majority of hospitals and physicians are reimbursed by fee-for-service, which creates incentives for health care providers to provide higher quantities of services, regardless of whether these services provide substantial or insignificant improvement to a patient's health. Even though most privately insured patients received care through some type

of managed care organization, most physician and hospital services continue to be reimbursed under a fee-for-service system as well. Therefore, the provider mentality of performing more services in order to earn greater revenues drives up spending in both the public and private sector.

The Affordable Care Act of 2010 was passed in order to increase access to medical care, which has become prohibitively expensive to a significant portion of the population. Substantial subsidies in the legislation increase access to public and private health insurance; individuals are required to obtain coverage beginning in 2014, and businesses with 50 or more full-time workers will pay penalties if they do not offer their workers affordable insurance coverage. However, the Supreme Court decided in June 2012 that the mandate for states to expand Medicaid under the legislation is unconstitutional. In addition, states have been slow to implement state-based health insurance exchanges, which are meant to be the primary source of health insurance for large numbers of currently uninsured individuals. The legislation takes inadequate steps to reduce the rate of growth in health care spending. Even if the ACA succeeds in the short term in improving access to health insurance, its long-term future will be doomed if expenditure growth is not contained. We recommend that the administration focus on expanding both public and private access to health insurance, while taking additional legislative steps to restrain cost growth.

Recommendation 1: Use any possible policy levers to encourage states to undertake the Medicaid expansion offered in the Affordable Care Act.

The Congressional Budget Office estimates that the Supreme Court's decision to allow states to individually choose whether to elect the Medicaid expansion will reduce the number of newly insured individuals under Medicaid and the Children's Health Insurance Program (CHIP) from 13 million to seven million in 2012.³ Some of the individuals who would have newly entered Medicaid are expected to obtain private health insurance through the exchanges instead. However, voluntary participation by states in Medicaid and CHIP is expected to lead to four million fewer individuals gaining health insurance coverage.

The administration should aim to encourage all states to elect the Medicaid expansion. The four million people who are at risk of not gaining Medicaid coverage are low-income individuals. Low income is associated with worse health status, so that both poor children and adults need significant medical care for a range of acute and chronic conditions. Most of these individuals cannot afford to pay out-of-pocket for medical care, so they frequently seek care from hospital emergency rooms, where federal regulations (e.g., the Emergency Medical Treatment and Active Labor Act) require that these patients be examined and receive stabilizing treatment if necessary. This care represents an extraordinary financial burden on hospitals, most of which is financed by local, state, and federal taxpayer dollars. Obtaining Medicaid coverage for these individuals would facilitate their ability to obtain care from medical clinics and outpatient facilities. Doing

so would lead to more coordinated care, which would improve the health of the patient and reduce inefficient expenditures in the health care system.

Previous research by Rice University's Baker Institute for Public Policy has determined that insuring all children in America will yield substantial economic benefits.⁴ Universal coverage for children will increase health care expenditures, but by a relatively small amount. The cost of health insurance for children will be offset by the increased value of additional life years and improved health-related quality of life gained from improved health care. From a societal perspective, it is cost saving to cover the most low-income children with Medicaid as possible through a full Medicaid expansion.

Some state politicians are reluctant to participate in the expansion because they prefer to see less government involvement in the provision of health care and not more. These policymakers fail to understand that a completely free-market system for provision of health care to low-income persons leads to significant economic inefficiency. Inadequate financial support for the purchase of medical services by low-income persons places burdens on the entire health care system, exacerbates problems with adverse selection in health insurance markets, and produces inefficiencies in the labor market due to greater numbers of ill workers.

The administration should be aggressive in explaining to the public the financial benefits of state participation in the Medicaid expansion. In addition to explaining the previous points to the public, the federal government should emphasize the generous terms of the Medicaid expansion to the states. States will receive 100 percent federal funding for the expansion from 2014 through 2016. State contributions will increase after 2016, but the federal government will continue to pay for 90 percent of the expansion from 2020 onward. This federal funding is essential for local hospitals, which will be losing subsidies for disproportionate share payments under the Affordable Care Act. The additional federal dollars will yield substantial economic benefit for local economies through a multiplier effect on local spending. These points have been explained in an op-ed in the *Houston Chronicle* written by the Baker Institute,⁵ but the message requires greater visibility through Internet, television, radio, and print media.

The administration should also encourage the Department of Health and Human Services (HHS) to explore flexible alternatives that allow at least partial uptake of the Medicaid expansion where state leaders are reluctant to participate. For example, some large counties in Texas are exploring the possibility of approaching HHS to negotiate participation in the Medicaid expansion on a county-by-county basis.⁶ The federal government would need to waive the requirement that eligibility standards for Medicaid apply statewide, and the Texas Legislature's approval would also be required. But this approach may be politically feasible, particularly with the strong lobbying power of large hospital systems in the biggest cities in Texas.

Recommendation 2: Structure health insurance exchanges that facilitate active purchasing in those states that have failed to create their own exchanges.

The state-based health insurance exchanges legislated under the Affordable Care Act are designed to increase access to health insurance for individuals who are unable to purchase affordable insurance through their employer and small business purchasers. Establishment of these markets, along with federal provision of premium and cost-sharing subsidies, will foster competition among insurers that will improve quality and lower prices. Both Massachusetts and Utah have implemented health insurance exchanges, although they have different structures. Massachusetts' exchange is referred to as the "active purchaser" model, because it has taken a hands-on approach in determining the nature of the health insurance products that insurers may offer in the exchange. In contrast, Utah's exchange is referred to as the "open market model," where the state provides information that allows consumers to compare competing health insurance policies, but takes a hands-off approach regarding the types of health insurance policies being offered.

Comparisons of the Massachusetts and Utah models, as well as the challenges that states are facing in structuring their health insurance exchanges, have been described by other health policy researchers.^{7,8} Based on these studies, we recommend that the administration adopt the Massachusetts active purchaser model for states that have chosen not to implement their own exchange. The Massachusetts Connector model places greater weight on benefit standardization across health insurance plans, which simplifies the shopping decision for consumers and allows them to make better-informed purchasing decisions. Insurance carriers are only allowed to offer one Gold product, two Silver, and three Bronze products in the Connector, where the colors symbolize the amount of cost-sharing involved in each insurance plan. For example, a Gold benefit is priced so that the expected benefits are actuarially equivalent to 80 percent of full value, while a Bronze product is priced so that expected benefits are only 60 percent of full value.

Another advantage of plan standardization in the active purchaser model is that insurers have less ability to engage in risk selection, where they would attract healthy individuals to purchase their product, while discouraging sicker people from electing their plans. Unlimited variety enables insurers to structure multiple plans specifically targeted to specific portions along the spectrum of health risk, in order to reduce their future expected medical expenses.

One can attribute much of the Massachusetts Connector's success to the aggressive effort the state made to educate residents and small businesses on its availability and operations. The Department of Revenue sent mailings to all taxpayers and small businesses regarding the exchange. Paid advertising was undertaken on radio, television, and print media. Informational postures and brochures were distributed at the Registry of Motor Vehicles, and all new residents are sent mailings on the Connector. The state also spends \$3.5 million annually in grants to community-based organizations to provide application and renewal assistance.

Recommendation 3: Alter CMS coverage decisions so that only cost-effective technologies are covered.

Medicare currently reimburses providers for medical treatments based only on effectiveness, not on value. As stated in congressional testimony in 2007 by Peter Orszag, Congressional Budget Office director, “the Medicare program has not taken costs into account in determining what services are covered and has made only limited use of comparative effectiveness data.” That is, Medicare is paying for some expensive technologies that “work,” but not very well.

An example of a technology covered by Medicare that is costly but of limited value is the left ventricular assist device (LVAD). LVADs are heart pumps for acute heart failure patients who are ineligible for a heart transplant. A recent study calculated that the cost per quality-adjusted life-year gained from using LVADs is £170,616. This figure represents the incremental costs of providing a patient with an LVAD, divided by the gain in life expectancy from the LVAD, adjusted for the fact that this increased life expectancy would not be spent in perfect health. Another U.S. study attempted to factor in future improvements in health technology and assumed that LVADs will be able to achieve a 15 percent reduction in mortality for heart failure patients by the year 2015.⁹ Even with this optimistic assumption, LVADs were predicted to cost \$511,962 (in 1999 dollars) per additional life-year gained. The additional cost of LVAD use to Medicare was predicted to reach \$10.1 billion in 2015.

Health economists tend to view medical technologies that cost \$100,000 per life-year saved or lower as cost-effective, and worth paying for. A recent study based on detailed economic modeling estimated that the value of a life-year peaks at \$350,000 at around age 50.¹⁰ Under either criteria, the price tag for the LVAD indicates that it does not provide sufficient value to the patient, relative to its costs. The additional cost per improvement in health status is just too high, and LVADs should not be covered by Medicare.

A second example of high-cost, low-value health care is treatments for back pain. A 2002 U.S. survey found that 26 percent of adults reported low back pain. Thus, the condition is widespread and accounts for a significant portion of health expenditures. Researchers estimated that the medical costs per patient of treating individuals with spine problems rose from \$4,695 in 1997 to \$6,096 in 2005.¹¹ Yet over this same time period, self-reported mental health, physical functioning, work/school limitations, and social limitations were all worse. In a span of eight years, this increase in expenditures was estimated to represent in \$85.9 billion in added costs to the health care system, but there was no demonstrated improvement in patient outcomes. Policymakers and clinicians must carefully review coverage decisions for back pain treatments, to determine whether any of these treatments are of value to patients.

In other cases, Medicare and private insurers reimburse health care providers for high-cost treatments that are provided to the wrong patient population. For example,

patients with stable coronary artery disease may benefit from an angioplasty to widen narrowed blood vessels. However, clinical guidelines state that patients must undergo a stress test before undergoing elective angioplasty in order to confirm the presence of restricted blood supply. However, a recent study determined that only 44.5 percent of Medicare patients underwent stress tests prior to angioplasty.¹² These figures suggest that a significant portion of angioplasties reimbursed by Medicare were unnecessary and needlessly placed patients at risk of complications from a complex medical procedure. More than 800,000 angioplasties are performed in the United States each year, and Medicare reimburses \$10,000 to \$15,000 per case. Therefore, there are significant savings to be achieved by requiring confirmation of the necessity of an angioplasty through a stress test.

Moving the Medicare system (and, in turn, the U.S. health care system) toward high quality, efficient health care requires the application of cost-effectiveness analysis when making coverage decisions for all costly medical treatments. These treatments may be costly because individual treatments are extremely expensive, or because the treatments are moderately costly and administered to substantial numbers of patients. In either case, policymakers and clinicians must determine whether each medical intervention yields health improvements to the patient that are worth the additional costs. The methodology for conducting such economic evaluations has matured over the last two decades, and we now have sufficient data and expertise for conducting these analyses.

One of the challenges of redirecting Medicare's focus to cost-effective technologies is shielding coverage decisions from the influence of health care providers and health technology manufacturers who are in danger of losing significant sources of revenue based on specific changes in reimbursement policy. For example, the Agency for Healthcare Research and Quality was in danger of elimination in the mid-1990s after issuing practice guidelines for back pain treatment that excluded existing forms of care for which physicians were receiving significant reimbursement. Whether CMS directly conducts cost-effectiveness analysis, or the task is assigned to a separate government agency, funding must not be linked to sources that can be influenced by political lobbying.

In addition, efforts must be made to educate the public on the intent of cost-effectiveness analysis. Patients are accustomed to believing that any treatment recommended by their physician must be highly effective. We must help patients understand that Medicare cannot and should not cover every possible medical treatment offered by the medical establishment. The government can dramatically improve its ability to identify technologies that are worth their additional costs and eliminate waste from the health care system. By reining in health care cost increases, the public will benefit from lower taxes to pay for Medicare, lower private health insurance premiums, and increasing rates of health insurance coverage.

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Science and Technology: Ensuring America's Science Future

By Neal F. Lane, Ph.D., and Kirstin R.W. Matthews, Ph.D.

“At a time when our economy is still recovering from the Great Recession, our top priority has to be jobs and growth. That’s the focus of the plan I talked about during the campaign ... It’s a plan to make sure this country is a global leader in research and technology and clean energy, which will attract new companies and high-wage jobs to America.”¹

—President Barack Obama, November 9, 2012

Science and technology (S&T) underpin almost every area of policy including national security, the economy, health and safety, the environment, education, energy, and agriculture. The close relationship between S&T and the ability of the nation to meet economic, security, and social goals is clear to government leaders in the United States and other developed nations, but it is a major policy factor in China, India, and other countries of the developing world, where large investments in research and development (R&D) are the rule. At the same time, there are indicators that the United States is starting to fall behind in S&T.² Moreover, most research in this country is carried out in America’s universities, which are facing a number of challenges to their continued excellence.³ This is a time when the U.S. should assign a particularly high priority to S&T, especially for federal support of research.

President Obama placed S&T high on his agenda early in his first term by recruiting high profile scientists to head the Office of Science and Technology Policy (OSTP), the National Science Foundation (NSF), the National Institute for Standards and Technology (NIST), the Department of Energy (DOE), the National Institutes of Health (NIH), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and other important agencies. The president also requested substantial multi-year increases in the R&D budgets for several of these organizations; implemented new initiatives in science, technology, engineering, and mathematics (STEM) education; expanded the number of human embryonic stem cell lines allowed to receive federal funding; and directed that federal agencies implement guidelines to ensure that politics do not influence science decision-making. These and other positive policy actions of the administration have placed S&T on a strong footing going into the second term, thus creating new opportunities to further strengthen American S&T.

It is in that spirit that we offer the following three recommendations for President Obama’s second term:

- **Recommendation 1:** Ensure that federal policy is grounded in the best scientific and technical information and advice.
- **Recommendation 2:** Enhance federally funded science and engineering research and science, technology, engineering, and mathematics (STEM) education.
- **Recommendation 3:** Promote legislation that codifies the president's 2009 executive order and NIH guidelines for human embryonic stem cell research.

With these three areas addressed, we believe that the federal government's science and technology policies will lead to economic growth and innovation through scientific discoveries and inventions as well as the education of the next generation of scientists and engineers.

Recommendation 1: Ensure that federal policy is grounded in the best scientific and technical information and advice.

Applications of the knowledge and tools that result from advances in S&T influence virtually every aspect of people's lives—how they live, work, communicate, stay healthy and happy—as well as public policy issues as diverse as energy, national security, and public health. To assure that the best policy decisions are made, it is essential that the best scientific and technical information and advice are available not only to the president and his White House team, but also to all senior policymakers in government. This requires that scientists, engineers, and other technical professionals be willing to commit a portion of their careers to government service. It also requires that the administration continue to recruit outstanding, qualified people to top positions in government and on federal advisory committees.

Recommendation 1.1: Designate the assistant to the president for science and technology ("president's science adviser") as a Cabinet officer who is invited to all Cabinet meetings as a participant.

President Obama's science adviser, John Holdren, reports directly to the president with the title "assistant to the president for science and technology." As has been the tradition, he also serves as director of OSTP, a Senate-confirmed position. Holdren and his OSTP staff are located in the Dwight David Eisenhower Executive Office Building, within the White House complex, thus giving them immediate access to other senior policy advisers and councils as well as to the president and vice president. Holdren participates in senior staff meetings and is invited to attend Cabinet meetings, along with other senior aides. His advice is also sought by Cabinet secretaries and heads of many federal agencies dealing with S&T issues. We believe that this important role should be recognized and encouraged by the president. Designating the science adviser as a Cabinet officer who actively participates in all Cabinet meetings alongside secretaries of departments and other Cabinet officers would ensure that S&T is appropriately considered in major policy discussions.

Recommendation 1.2: Nominate individuals to fill all four Senate-confirmed associate director positions in OSTP as soon as possible and ensure that the OSTP budget is sufficient to support the president's enhanced S&T research and STEM education priorities.

OSTP has authorization for four Senate-confirmed associate director positions. Three of these are currently vacant. We recommend that the president, with the science adviser, fill the remaining three positions in science, technology, and environment and energy as soon as possible to allow the departments to move forward on the president's science and engineering initiatives for the second term.

Furthermore, we recommend the OSTP budget be increased above fiscal year 2011 levels to allow the office to adequately support the president's ambitious science and engineering initiatives and priorities. Last year, Congress penalized OSTP for doing its job—working with other countries to build ties in science and engineering R&D that are beneficial to the United States. Because one of these countries was China, Congress reduced the OSTP appropriation by 32 percent. Restoring the OSTP budget should be a high priority during budget negotiations with Congress.

Recommendation 1.3: Review compliance of agencies with the president's "Memorandum on Scientific Integrity" and, if deficiencies are found, direct agencies to take corrective action.

On March 9, 2009, President Obama issued the Memorandum on Scientific Integrity, which assigned the science adviser the responsibility of ensuring scientific integrity throughout the executive branch.⁴ OSTP released recommendations in December 2010, and agencies and departments began to submit their policies shortly thereafter.⁵

We commend the administration for addressing these issues during the president's first term and recommend that the OSTP oversee a comprehensive review of the departments and agencies to verify compliance with the rules, and to work with agencies to correct any deficiencies in their policies. We believe this review is necessary to emphasize the importance of maintaining scientific integrity in federal government activities, including the process of selecting and retaining scientific advisers; allowing government scientists to express their views in their areas of expertise; ensuring that accurate scientific information is available to the public and policymakers and is the basis of regulations and other federal policies; and, in general, keeping partisan politics out of S&T policy matters.

Recommendation 2: Enhance federally funded science and engineering research and science, technology, engineering, and mathematics (STEM) education.

U.S. government policies on S&T matters have important ramifications for universities as well as most industrial sectors and millions of high quality jobs. U.S. science and engineering R&D has spearheaded innovation that has been a major driving force for our economy since World War II. New products, powerful medical treatments, and innovative

technologies that lead to new jobs all come out of discoveries and inventions based on science and engineering R&D—often from universities—funded by federal agencies. But the future of S&T in the United States is in limbo, with many decisions on funding for R&D agencies in question as the president and Congress contend with the federal budget deficit. President Obama will set priorities for the upcoming budgets, advancing some initiatives and programs at the expense of others. We believe that increased investments in S&T, particularly funding for research activities and facilities and equipment, will contribute to the nation's economic recovery as well as ensure its long-term economic sustainability and security.

Recommendation 2.1: Reaffirm the president's commitment to double R&D funding for the three research agencies—NSF, NIST, and DOE's Office of Science—over a decade; and commit to real growth in the NIH budgets.

Federal investment in non-defense R&D (which is mainly research), as a fraction of the gross domestic product (GDP), dropped to 0.4 percent in 2012 from 0.7 percent in 1970.⁶ While the U.S. spends approximately \$140 billion—or 2 percent of its total annual budget—on R&D, most of these funds are spent on development and testing of large weapons systems for the Department of Defense. Only \$56 billion (fiscal year 2013) is invested in research (basic and applied) conducted in universities, medical schools, and national laboratories. The NIH budget is roughly half of the total federal investment in non-defense R&D. But after seeing its budget double from 1998 to 2002, and after participating in the stimulus investments of the American Recovery and Reinvestment Act of 2009, the NIH budget has been flat, or increased in amounts lower than the rate of inflation, each year for the past decade. In constant dollars, the NIH budget has actually decreased since 2005, after adjusting for inflation. The NSF, NIST, and DOE's Office of Science budgets have fared better, seeing modest increases under the Obama administration, but they still have seen little real growth over the past several decades.

We recommend that the president continue his commitment to double the budgets of NSF, NIST, and DOE's Offices of Science over the next decade as well as provide for some real growth in the NIH budget. Clearly, increases in agency budgets, especially during a time of budget austerity, will receive a high level of scrutiny. When it comes to research, peer review (employed by the above agencies) is the best mechanism to ensure these funds are spent wisely. These increases are prudent investments in S&T that are likely to pay big dividends in both the short- and long-run.

Recommendation 2.2: Place a high priority on increasing funding for early-career research and high-risk, high-reward (potentially transformational) research in all agencies supporting R&D.

Scientists applying for NSF and NIH grants are seeing the lowest success rates in decades. This development has the greatest impact on grants for new and young investigators, as well as grants proposing highly innovative projects that have a higher risk of failure, but if successful would be transformational. But regardless of the budget levels, additional funding should be provided to improve support for early-career investigators and high-risk, high-reward, “transformational” projects.⁷

NSF defines transformational research as “research driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or leading to the creation of a new paradigm or field of science or engineering.”⁸ Agencies have trouble funding truly daring and high-risk ideas for which the opinions of expert reviewers are often mixed. When funding is limited, projects that are innovative, but unconventional, usually get put aside in favor of low-risk projects with more predictable results. Science often proceeds in incremental steps, though unexpected breakthroughs that can result in bold paradigm shifts, and projects challenging accepted ideas, make the biggest contributions to new innovations.

These issues also impact young scientists who increasingly face long graduate and post-doctoral training periods before having an opportunity to establish independent careers. Many agencies have difficulty cultivating and rewarding new investigators, especially during times in which overall success rates are low. From 1980 to 2008, the average age for a first-time NIH grantee increased from 37 to 42, while faculty positions in medical schools more than doubled (medical schools receive approximately 55 percent of NIH’s research funding).⁹

Recommendation 2.3: Implement necessary reforms in visa and export control policies to remove barriers to international research collaboration and foreign students who wish to study in U.S. universities.

International scientific collaboration will be increasingly important in meeting the many challenges of the 21st century, such as understanding and responding to global climate change and finding better therapies and cures for diseases. While most scientists and engineers are eager to engage with their international counterparts, some U.S. policies—including visa and export control issues—inhibit these interactions. The most common barriers to scientific collaborations are the difficulties associated with obtaining a visa to study in the U.S. or even visit the United States. The U.S. State Department should improve its visa application process by hiring more specialists with scientific and technical backgrounds who can knowledgeably review visa applications. In addition, U.S. export controls and International Traffic in Arms Regulations (ITAR) should be reviewed and revised to avoid unintended damage to both research collaborations and the exchange of research findings. This is a particularly serious problem for research related to the space program.

Recommendation 2.4: Create a set of “presidential grand research challenges” and interdisciplinary federal research budget initiatives focused on specific national needs early in the second term.

In his first term, President Obama increased research funding incrementally in several key agencies—notably NSF, NIST, and the DOE’s Office of Science—and he is committed to continuing his strong support for science. In addition to each agency’s individual accomplishments, the impact of federal investments can multiply if agencies work together. We recommend that the president set a series of interdisciplinary, interagency grand challenges to help focus on issues of high importance including, but not limited to,

climate change, renewable energy, the environment, health technology, and infectious disease prevention. These “presidential grand research challenges” will help highlight current U.S. research programs as well as galvanize new interdisciplinary approaches to big research questions. Consideration should be given not only to coordinating related research activities of various agencies but also to co-funding major projects.

Recommendation 2.5: Give high priority to implementing the recommendations of the President's Council of Advisers on Science and Technology (PCAST) to improve the nation's STEM education and provide necessary funding.

PCAST is a top-level external advisory body for the president on all matters of S&T. It includes leading scientists, engineers, and industry leaders appointed by the president to help guide S&T policy. During President Obama's first term, PCAST produced two insightful reports on STEM education issues. In 2010, PCAST made a series of recommendations on improving K-12 STEM education.¹⁰ These recommendations included improving federal coordination and leadership in STEM education; supporting state-led movements to adopt national baselines; creating STEM-related experiences to excite students; and cultivating, recruiting, and rewarding STEM teachers who prepare and inspire students. The second report proposed ways to attract new STEM college graduates, with the goal of graduating an additional one million students in the next decade with STEM degrees.¹¹ Recommendations included catalyzing the adoption of empirically validated teaching practices, advocating for the support of discovery-based research courses, launching national experiments to improve math education and scores, encouraging partnerships with different stakeholders in education, and creating a presidential council on STEM education to provide leadership on changes to undergraduate STEM education. With funding, these initiatives can go a long way toward educating the next generation of scientists and engineers in the United States.

Recommendation 2.6: Establish a dialogue with research universities and industrial sectors concerned with the country's status in S&T to explore new mechanisms for cooperation in the nonpartisan analysis of policy options on vital national issues.

Over the past 60 years, the federal government's approach to science and technology, R&D in particular, has been based on principles created immediately after World War II—principles stemming from a model put forward by Vannevar Bush in his “Science, the Endless Frontier” report to President Harry Truman—and in response to the Cold War.¹² But since the end of the Cold War, the national security impetus for steady investments in R&D has faded, and no powerful rationale has emerged to replace it. In today's world, federal S&T research priorities have largely shifted toward finding medical treatments and therapies. Thus, NIH budgets increased in real terms until the past decade to encompass approximately one-half of all S&T research spending. But research funding for other scientific disciplines, including chemistry, physics, engineering, and basic biology, which provide the basic knowledge for the drugs and technologies currently in use in hospitals, lagged behind. This lack of a balance and direction highlights the need for a new paradigm in science policy development.

What the new paradigm should be is unclear, but we should consider allowing federal policymakers who deal with S&T matters to have convenient access to objective, nonpartisan analysis of rational policy options. To explore plausible approaches to accomplishing this goal, we believe that one or more nongovernmental organizations concerned with S&T policy should call together recognized leaders who can bring the perspectives of government, academia, and industry to the table. It will be important to have the views of high-level federal officials currently serving in the administration. We recommend that the president encourage participation in this effort.

Recommendation 3: Promote legislation that codifies the president’s 2009 executive order and NIH guidelines for human embryonic stem cell research.

Human embryonic stem cell (hESC) research is an emerging field of biomedical research that started in 1998 with the derivation of the first cell line. Scientists look forward to the possibility that hESCs, along with other types of stem cells found in adults, can advance research in areas as diverse as developmental biology, cancer research, and regenerative medicine.

Early in his administration, President Obama passed an executive order that directed NIH to develop new guidelines for regulating federally funded hESC research.¹³ As with the previous administration, and consistent with the “Dickey-Wicker Amendment” appropriation rider, the NIH only funds research that uses hESC lines previously approved by an ethics review committee and created through private funds. As of November 2012, there are 184 hESC lines eligible for federal funding, a nine-fold increase from 21 lines in 2008.¹⁴ Following the adoption of the new NIH guidelines, a lawsuit was brought against the federal government, *Sherley v. Sebelius*, which challenged the new NIH guidelines. A district court judge subsequently granted a preliminary injunction halting all funding of hESC research at NIH. Ultimately, the injunction was dismissed as well as the case, but scientists had already begun to question the sustainability of this type research.

During the past 15 years, each presidential administration—Presidents Bill Clinton, George W. Bush, and now Obama—have created their own stem cell policies using executive orders. While there was consistency during each administration, the executive orders were altered when a new president was elected. This inconsistency is negatively impacting stem cell research, causing scientists to shy away from the field and making them unsure about the area’s funding future.

Working with Congress, the president should create new legislation that will make his 2009 executive order permanent. The law should:

- Support research on all types of human stem cells, including embryonic and adult.

- Authorize federal funding of hESC research on lines derived according to NIH ethical guidelines, regardless of the date the cell lines were derived or created.
- Clarify which research is eligible for federal funding (i.e., research utilizing approved hESCs) and which research is not (i.e., the creation of hESC lines).

This law would assure scientists that federal policy would remain the same year-to-year and administration-to-administration.

Conclusion

Science and technology impact most areas of public policy, including domestic and national security, energy and climate change, the environment, health and safety, agriculture, transportation, education, and, of most immediate concern, the economy and jobs for Americans. From federal investments in science and engineering R&D, particularly basic and applied research, we obtain new knowledge and technologies that improve the ability of our nation to meet its economic, security, and social goals. In the United States, scientific discoveries and technological breakthroughs have been shown to drive innovation, which plays a vital role in sustainable economic growth.

The second term of the Obama administration will provide a unique opportunity to keep the nation on track to advance U.S. science and technology research and ensure its applications to societal goals. That will require that the administration's S&T team give particular attention to the integrity of scientific advice to government, research funding, STEM education, the creation of a permanent U.S. stem cell policy, and the development of new tools for science policy.

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U.S. – China Relations: Energy and Environmental Policy

By Steven W. Lewis, Ph.D.

Overview

Assuming current conflicts between China and the United States on security matters—in the South and East China Seas, and in cyberspace—can be solved through skilled negotiation and diplomacy, the major long-term threat the two superpowers pose to each other is a lack of coordination in solving shared energy and environment problems. Our mutual love of decentralized government, and unchecked consumption, has produced a situation in which the two largest economies each lack effective national energy and environmental policies; moreover, neither feels the need for such policies in the absence of actions to create them on the part of the other. Increasingly, China and the United States are competitors in a race toward unsustainable growth, and if we are not careful we will soon also become unwitting partners in an energy and environmental suicide pact.

A second-term Obama administration should take prudent action now to avert disasters that are very real and yet fortunately still years away from manifesting themselves:

- **Recommendation 1:** The president should leverage his immense personal popularity with young people to engage the American and Chinese publics and move them toward shared action to solve shared energy and environment problems.
- **Recommendation 2:** The administration should renew efforts to integrate the Chinese government into the energy policy coordination organizations of the major energy-consuming nations, including the International Energy Agency.
- **Recommendation 3:** The administration must not only deepen the information and research ties between U.S. federal and Chinese central government energy regulators, they must also take them to the next level and broaden them to include the major regulators of energy investments in both societies: local governments.

Background

Although currently there is increased potential for conflict between the United States and China in the South China Sea and the East China Sea, in cyberspace, and across the trade negotiations table, relations in general between the United States and China are fundamentally based on cooperation. And yet, even assuming the Obama

administration's able experts and diplomats can cool down the above hot spots—as they are working hard to do—and that they can ensure top foreign affairs and economic officials who are retiring are replaced by equally capable and China-savvy negotiators, America and China will surely still face considerable obstacles to future coexistence. This is inevitable not because of differences in political ideology (i.e., one society is led by a government with a multiparty democratic system, and the other is a state based on one-party authoritarian control of all organizations and groups); or because of differences in economic structure (i.e., one is based on small and medium enterprises and has very few state-owned companies, the other supports and depends upon a core of enormous central-government-owned manufacturing and financial enterprises).

The biggest threat that America and China pose to each other in the long-term is not a lack of cooperation, but rather a lack of coordination. We are the two largest economies, the two largest consumer societies, and the two largest decentralized political and economic systems. Chinese and Americans may differ on many political and cultural beliefs, but what we share is a love of competition and of consumption. We look up to the Acropolis but we spend all of our time playing in the Agora, enjoying the give and take, the take and the give.

Chinese provinces and municipalities compete with each other intensely for capital, labor, and technology. An offer to investors of tax breaks and local government subsidies in Shenzhen in South China is soon matched by greater, undercutting offers from Shanghai in East China, or Dalian in Northeast China. The same competition exists between Houston, Chicago, and New York. And Chinese and American laborers and professionals alike work some of the longest hours seen anywhere. Americans are accustomed to a few weeks of vacation each year, and so are most Chinese. American and Chinese consumers are equally relentless: there are no blue laws that keep businesses closed on weekends or evenings in either Los Angeles or Wuhan, or New Orleans or Xiamen. Chinese and Americans work hard and shop harder. As many of the light goods consumed in America are made in China, and as many of China's top scientists, educators, and innovators are educated in America, and as the government budgets of each country are dependent on the continued consumption of financial instruments and strategic investments of the other, there is a very real symbiosis: a state of "Chimerica," as some observers have dubbed the union of the world's two largest economies. America has replaced the Mutual Assured Destruction relationship with the Soviet Union during the Cold War with one of Mutual Assured Dependence with the People's Republic of China.

Fortunately for all concerned, both Americans and Chinese now recognize that such unchecked and unregulated consumption is not sustainable. The majority of Americans now believe in global warming and demand government action to slow the consumption of carbon fuels and to increase research to find new ways to keep greenhouse gases from radically changing our environment. Surveys in China reveal similar beliefs there, with the Chinese central government proposing aggressive industrial policies to curb carbon-intensive energy use as part of its 12th Five Year Plan (2011-2016). Chinese citizens are

increasingly mobilizing to protest harmful industrial byproducts in their living spaces, and it is only a matter of time before the citizens of the world's most polluted cities—Beijing and Shanghai—react as London's did after the Great Smog of 1952 and demand clean air legislation and a shift to cleaner forms of energy.

The danger to both China and America is that we will respond in radically different ways, and in particular adopt new technologies and systems of energy production and distribution and consumption that are not compatible with each other, thereby depriving both of our societies of the economies of scale and scope that might make such technologies affordable to all. This outcome is even more likely given the sustainability strategies of the two groups of governments who have moved early in order to try to capture the first-mover advantage in technological change: Western Europe and Japan/South Korea. The global effort to achieve sustainable growth is currently locked in stasis, waiting for the two largest consumer societies, the United States and China, to try to decide if they will follow either the European or the East Asian models—or if they will instead each go down their own road, or each share a common path. China and the United States need to come to a decision soon on whether or not they will walk down the same path to sustainability.

Recommendation 1: The president should leverage his immense personal popularity with young people to engage the American and Chinese publics and move them toward shared action to solve shared energy and environment problems.

The individual consumer today has unprecedented access to energy resources. The global climate clearly cannot survive the addition of hundreds of millions of new Chinese middle-class consumers who use energy as freely and wastefully as their U.S. counterparts. President Obama needs to lay the foundation for a new type of international energy public diplomacy, one that mobilizes consumers in China and the United States to shift to sustainable energy use and conservation techniques. Surveys show that both the Chinese and the American public are concerned about global warming, and that both populations value clean urban environments over unfettered industrial development. Neither population, however, sees its energy consumption and conservation as related to the energy consumption of the other. Furthermore, Chinese and Americans do not realize that their shared need for more reduced energy demand creates a vast potential marketplace for the low-cost adoption of clean energy technology and the training of conservation techniques. President Obama thus faces the critical long-term task of making American and Chinese consumers realize that, being part of the same problem, they need to collaborate on the adoption of lasting solutions to shared energy and environmental problems.

He should start with American and Chinese youth. President Obama's popularity with future generations of Chinese leaders was amply demonstrated during his chat with university students in Shanghai in fall 2009. The students were not just enthusiastic

about speaking directly with a charismatic world leader, they were excited to talk with somebody a generation close to theirs and one capable of communicating across cultures and generations. The new Chinese Party leader, Xi Jinping, showed his ability to speak more like an average person during his inaugural press conference on November 16, 2012, but it is unlikely he or other Chinese leaders will ever seek to engage China's young people in the language they actually use. Rules of Party discipline requiring that the Party Secretariat vet all public addresses by senior leaders make this especially problematic. Or, in other words, the Chinese government has few means to motivate China's youth to tackle energy and environment policy in a sustained and exciting way. President Obama, however, because of his charisma and his age—he is 10 years younger than President Xi—is capable of generating and then maintaining enthusiasm among Chinese and American students during his second term and for many years beyond.

In his 2009 meeting with Chinese students, President Obama skillfully redirected questions about himself toward answers that talked about a shared future between American and Chinese youth, including environmental and energy matters. It is now time for President Obama to go the next step and start a new public diplomacy initiative designed to bring together young Americans and young Chinese. As advocated by the Baker Institute Energy Forum, and by such advisers to the Obama administration as Kenneth Lieberthal and David Sandalow, a transnational or international youth corps focused on energy and environmental education in both societies would go a long way toward generating enthusiasm among both American and Chinese young people. Philanthropic foundations and individuals in both China and America could be persuaded to set up a nonprofit, public diplomacy initiative that would manage such a program in the years beyond the final Obama administration.

The Obama administration should also consider new forms of media designed to persuade both American and Chinese consumers that they are jointly responsible for the world's future sustainability. Recent research by the Baker Institute Transnational China Project reveals that America and China have much untapped potential in public service advertising (PSA) in their public spaces. Surveys of PSAs in the subway systems of American and Chinese cities show they share similarities, including a focus on energy and environmental issues, as well as rules requiring that 10 percent of spaces for all advertisements be reserved for PSAs. What they also reveal, unfortunately, is that most American and Chinese PSA producers view energy and environmental issues as largely local ones: people need to pitch in within their community to help, and local governments are leading the way on sustainability, etc. Missing in this is a global counterbalance to the worldwide proliferation of consumer ads telling people to shop like global middle-class consumers. But with little cost to taxpayers, Chinese and American students, citizen groups, and nongovernmental organizations (NGOs) could work together to develop PSAs that set up a dialogue between American and Chinese publics and begin to teach future generations in both societies the value of thinking of sustainable growth as a shared problem (which it certainly is). Both American and Chinese populations need to realize they cannot achieve sustainability without joint action, and

that each of them are working together toward this goal. Cooperation in this area of PSAs could also help generate cooperation between publics on other global problems, such as overconsumption of antibiotics.

Recommendation 2: The administration should renew efforts to integrate the Chinese government into the energy policy coordination organizations of the major energy-consuming nations, the International Energy Agency in particular.

The United States and its Organisation for Economic Co-operation and Development (OECD) partners have been discussing how to bring the future large consumers—India and China—into the oil supply stabilization arrangements of the International Energy Agency (IEA). In its second term, the Obama administration should continue to support these multilateral negotiations. These future oil consumers, and our Asian allies Japan and South Korea, need to have market access to diverse supplies of oil and gas—Asian countries currently receive relatively little oil and gas from Latin America, Russia, and Africa. China has only recently begun to import significant amounts of oil from Russia and Kazakhstan. These new energy superpowers also need to build adequate strategic petroleum and product reserves and to participate in international emergency release arrangements. Over the last decade, China has experienced gasoline shortages in its economically vibrant and yet resource-poor coastal regions because the country has not yet built stockpiles sufficient to see it through short-term disruptions in supply. The United States and other IEA nations must continue to work with the Chinese government to make sure China does not become a more aggressive seeker of overseas oil supplies or even a panic buyer in world energy markets.

On a related matter, the administration should also broaden the mandate of the new Global Shale Gas Initiative of the State Department to include working with the Chinese government and its oil and gas companies, at central and local levels, to explore the potential of shale oil. U.S. shale oil has added more than one million barrels a day (b/d) to domestic oil production, and an equal advance in China would greatly help China offset its four million b/d of imports from overseas, including two million b/d from the Middle East. Currently, the old oil-producing regions of China's North and Northeast—Heilongjiang, Jilin, and Liaoning in the Northeast, and Shandong and Hebei in the North and East—have made no efforts to develop shale gas, but they have expressed strong interest in shale oil. With advice from the U.S. State Department and joint ventures with many of the oil and gas multinational companies, and shale gas development companies of America, the three central national oil companies in China—CNPC, Sinopec, and CNOOC—are developing shale gas in Southwestern China's Sichuan Province and Chongqing Municipality. As a forthcoming report from the Baker Institute Center for Energy Studies shows, such assistance could potentially greatly help wean China's interior Northern and Western regions off of coal, but assistance in developing shale oil in the Northeast and North would make China much less dependent on its traditional Middle East energy suppliers, including Iran.

Recommendation 3: The administration must not only deepen the information and research ties between U.S. federal and Chinese central government energy regulators, they must also take them to the next level and broaden them to include the major regulators of energy investments in both societies: local governments.

In the last few years, the Chinese and American governments have set up joint energy research facilities in China and the United States. At the fourth meeting of the U.S.-China Strategic Economic Dialogue in June 2008, officials from both countries created the U.S.-China Ten Year Energy and Environment Cooperation Framework. Five task forces were formed to develop (1) clean, efficient, and secure electricity production and transmission, (2) clean water, (3) clean air, (4) clean and efficient transportation, and (5) conservation of forest and wetland systems. More recently, the formation of the new Bureau of Energy Resources within the State Department gives new strength and capacity to our efforts to work with the Chinese government on negotiation issues. This has followed a continual growth in institutional ties between the U.S. federal government and the Chinese central government. The annual meetings of U.S. and Chinese officials initiated during the Clinton administration have been replaced by daily, personal contact between the two large central bureaucracies.

The inclusion of energy and environmental issues in the Strategic Economic Dialogue should continue so long as these issues do not become subordinated to other economic interests or stalled. And if these task forces do not continue to produce concrete, measurable progress according to the goals outlined in the energy and environment cooperation framework, both governments should consider a higher level of formal interaction on energy issues. As the United States and other countries have done in the past, each government could task key central leaders with handling energy and environment cooperation. The U.S. vice president should be prepared to go to Beijing to discuss with the new 18th Politburo of the Chinese Communist Party under General Secretary and President Xi Jinping and premier-designate Li Keqiang what can be done to move forward ties on energy and environmental issues if the strategic dialogues do not bear fruit.

The Obama administration must be mindful that in energy and environmental matters it needs to keep its negotiating gaze fixed upon talks with Chinese officials with Politburo ranking. As a December 2011 Baker Institute Energy Forum report outlines, the National Energy Commission has an impressive title and high bureaucratic profile, and yet in practice its implementation strength is undeveloped. The National Energy Bureau under the National Development Reform Commission is still understaffed, and on energy and gas policy is largely dependent on the three national oil companies. The Obama administration must be able to credibly demonstrate that it can dispatch the vice president to Beijing to talk with the members of the new Politburo Standing Committee who run day-to-day economic policy if regular talks by lower level officials do not produce the required coordination and cooperation. Relying solely upon the Strategic and

Economic Dialogues or upon official ties from U.S. agencies might not move both sides past bureaucratic inertia. On the American side, the U.S. Department of Energy is highly focused on nuclear security and nonproliferation issues, even in its offices in Beijing, and the State Department's new Bureau for Energy Resources is focused on energy talks among diplomats and energy security experts.

But we also have to ask whether or not existing bureaucratic ties can themselves produce the type of long-term cooperation necessary for sustainable economic growth, especially growth that would reduce demand for energy. The current era of globalization is one marked by the increasing economic power of local government. China's central government directly controls nuclear energy and, through the three major national oil companies, guides investment in oil and gas; most of China's power is, however, produced by its 31 provincial and municipal governments. China's most advanced export manufacturing provinces alone spend \$3-4 billion each year on new power generation. In the new field of shale gas, it is local governments that are taking the lead, with the blessing of the central government, which feels that the three national oil companies do not have the proper incentives to be aggressive and innovative in developing shale gas. Shaanxi and Shanxi in China's coal belt of North China, for example, have already announced their own plans to develop shale gas in order to "gasify" their economy and move away from excess dependence on coal. Similarly, the coal- and oil-poor provinces of East and South China, the country's most advanced economically, are also moving boldly to partner with foreign companies to explore shale gas.

The Obama administration needs to ramp up its influence in the provinces and, more importantly, get the Chinese localities learning from American localities. The Department of Energy has thus far sponsored a few trips by local officials to visit with California energy and local governments, and this sort of local-to-local diplomacy needs to be increased—especially efforts to work with the local governments of America's major shale gas and shale oil producing states to introduce oil and gas policy at the local level to Chinese provincial energy officials, who are almost exclusively experts in power. In a related matter, Chinese localities would benefit greatly from talking with local environmental protection agencies and also civic groups and think tanks about shale gas and shale oil. If China is to develop this potentially transformative new set of fuels, its local governments will need help from the American local governments who know it best.

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Marijuana Prohibition: Going Up in Smoke? and Sterile Syringes for Injecting Drug Users

By William Martin, Ph.D.

Overview

Marijuana Prohibition: Going Up in Smoke?

- **Recommendation 1.1:** Cease federal interference with medical-marijuana dispensaries, suppliers, and users acting in accord with state law.
- **Recommendation 1.2:** Encourage research to establish a clearer picture of the potential benefits and harms of cannabis.
- **Recommendation 1.3:** Allow states and smaller jurisdictions to experiment with regulation and taxation of marijuana for recreational use.

Sterile Syringes for Injecting Drug Users

- **Recommendation 2.1:** Remove the ban on the use of federal funds for programs and projects that provide sterile syringes to injecting drug users as a proven means of reducing the spread of blood-borne diseases such as HIV/AIDS and hepatitis C.
- **Recommendation 2.2:** Authorize federal funding and encourage other forms of governmental and nongovernmental funding for programs that increase the availability of sterile syringes to injecting drug users.
- **Recommendation 2.3:** Allow funds from the President's Emergency Plan for AIDS Relief (PEPFAR) to be used to provide sterile syringes to injecting drug users.

Marijuana Prohibition: Going Up in Smoke

Background

Most Americans know that our national drug policy, which we have tried to impose on much of the world, is deeply flawed. Only 24 percent of our citizens, according to a 2008 Zogby poll, believe the policy is effective. In the 40 years since President Richard Nixon declared a War on Drugs, federal, state, and local governments have spent hundreds of billions of dollars on eradication, interdiction, and incarceration. They have seized tons of contraband, destroyed millions of acres of drug crops, and imprisoned more people than any other country, a disproportionate number of them poor and black. Despite these efforts, drugs continue to be available to meet a remarkably stable demand.

Our War on Drugs has cost more than \$1 trillion since 1970, has resulted in the incarceration of hundreds of thousands of American citizens, and has played a major role in stimulating the growth and prosperity of murderous drug trafficking organizations in Mexico and elsewhere. Like other wars we have been engaged in over this period, victory has been elusive. Illicit drugs remain readily available, are of higher quality, and sell for a cheaper price than at the beginning of this four-decade campaign to create a drug-free America.

This is not an eccentric opinion. In May 2010, the World Bank issued a scathing indictment of the War on Drugs. In June 2011, the U.S. Conference of Mayors issued a unanimous resolution declaring the War on Drugs to be a failure. A month later, the NAACP released a similar resolution. Perhaps most notable is a document prepared by the Global Commission on Drug Policy, whose members included such luminaries as George Shultz, secretary of state under Ronald Reagan; Kofi Annan, former secretary general of the United Nations; Paul Volcker, former chairman of the U.S. Federal Reserve; Ernesto Zedillo, former president of Mexico; César Gaviria, former president of Colombia; Fernando Henrique Cardoso, former president of Brazil; George Papandreou, former prime minister of Greece; Ruth Dreifuss, former president of Switzerland; writers Carlos Fuentes and Mario Vargas Llosa; and entrepreneur Richard Branson.

The Global Commission's 2011 report begins with the flat assertion, "The global war on drugs has failed, with devastating consequences for individuals and societies around the world ... Vast expenditures on criminalization and repressive measures directed at producers, traffickers, and consumers of illegal drugs have clearly failed to effectively curtail supply or consumption." One of its main recommendations is to "encourage experimentation by governments with models of legal regulation of drugs (with cannabis, for example) to undermine the power of organized crime and safeguard the health and security of their citizens" (Global Commission on Drug Policy 2012).

Other nations have instituted approaches other than prohibition to deal with drug use and abuse. Three notable examples are the Netherlands' "coffee shops" that sell cannabis (marijuana), Switzerland's successful use of heroin maintenance programs, and Portugal's laudable decision to deal with drug abuse as a matter of public health rather than a crime. For the near future, however, there is little public or political support in this country for legal regulation of any now-illicit drug other than marijuana, but that support clearly exists and is rapidly growing. Three-quarters of Americans support legalizing medical marijuana and, with the addition of Massachusetts in the November 6, 2012, election, 18 states and the District of Columbia have done so. In that same election, four cities in Michigan voted to remove local penalties for possession of modest amounts of marijuana or to make possession the city's lowest law enforcement priority. Forty municipalities in Massachusetts voted to instruct legislators from their districts to vote in favor of decriminalizing marijuana use by adults. Far more significantly, Colorado and Washington voted to end cannabis prohibition entirely, in favor of distribution models similar to those in place for alcohol and tobacco.

All these measures violate and consciously challenge federal prohibition on the production, distribution, and use of cannabis. Response by law enforcement agents has been uneven, ranging from formal cooperation to harsh reprisal even when individuals were in full compliance with local laws. Deeply entrenched advocates of prohibition continue to resist any form of regulation and to insist that legalizing marijuana use will lead to widespread ruin. But, as Seneca observed long ago, “Laws do not persuade just because they threaten.”

Recommendation 1.1: Cease federal interference with medical marijuana dispensaries, suppliers, and users acting in accord with state law.

During the 2008 campaign, Mr. President, you said, “I think the basic concept of using medical marijuana for the same purposes and with the same controls as other drugs prescribed by doctors, I think that’s entirely appropriate. I’m not going to be using Justice Department resources to try to circumvent state laws on this issue” (Nelson 2008). The actions of your administration have not reflected your stated intention. In the last four years, the Drug Enforcement Administration (DEA) has conducted more raids of state-licensed dispensaries than during your predecessor’s eight years in office. In addition, the DEA and U.S. Attorneys have threatened landlords with closure or forfeiture of properties housing dispensaries and even threatened to punish governors and other state and local officials who signed medical marijuana bills into law. In addition, the Federal Deposit Insurance Corporation has warned banks not to accept accounts from entities involved in state-sanctioned medical marijuana enterprises (Wilbur 2012).

You have correctly observed that you cannot nullify congressional law or ask the Justice Department to ignore federal laws that are on the books. But you have amplified that observation by noting that you are able to say, “Use your prosecutorial discretion and properly prioritize your resources to go after things that are really doing folks damage.” A growing number of municipalities have adopted “lowest priority policies,” which do not actually legalize marijuana, but explicitly instruct law enforcement personnel not to arrest nonproblematic users unless they can find nothing else to do with their time. Seattle pioneered this approach by passing Initiative 75 in 2003. An assessment after four years found no increase in marijuana use among youth and young adults, no increase in crime, and no adverse impact on public health. A study of people involved with state-approved medical marijuana would quite likely yield even more positive results. Decisively conveying that information and making clear its implications should lead both the DEA and U.S. Attorneys to rethink their actions of the past four years, particularly since all of them are appointed, either directly or indirectly, by the executive branch.

Recommendation 1.2: Encourage research to establish a clearer picture of the potential benefits and harms of cannabis.

The DEA classifies cannabis as a Schedule I drug, along with LSD and heroin, asserting that it has no medical use. Millions of people, including many physicians as well as therapeutic users, emphatically dispute this assertion, but the classification remains because research that would settle the matter scientifically has been systematically blocked for decades. As a November 22, 2004, editorial in *Scientific American* explained:

“Any researcher attempting to study marijuana must obtain it through the National Institute on Drug Abuse (NIDA). The U.S. research crop, grown at a single facility, is regarded as less potent—and therefore less medically interesting—than the marijuana often easily available on the street. Thus, the legal supply is a poor vehicle for studying the approximately 60 cannabinoids that might have medical applications ... The reasonable course is to make it easier for American researchers to at least examine marijuana for possible medical benefits. Great Britain, no slacker in the War on Drugs, takes this approach: the government has authorized a pharmaceutical firm to grow different strains of marijuana for clinical trials.”

Health Canada, roughly equivalent to the U.S. Food and Drug Administration, has produced an extensive document detailing the known and potential benefits and negative effects of marijuana used for therapeutic purposes (Health Canada 2010). It is odd and unfortunate that U.S. scientists are not able to conduct research that could establish with reasonable confidence whether and which of the claims by proponents, opponents, and disinterested researchers regarding the therapeutic potential of marijuana rest on solid ground. In addition, such research should and surely would provide valuable empirical information about the real and alleged risks of legalizing marijuana for “recreational” use. Encouragement from your administration would be an important stimulus to this important scientific endeavor.

Recommendation 1.3: Allow states and smaller jurisdictions to experiment with regulation and taxation of marijuana for recreational use.

As noted above, a growing number of states and cities have voted to install various alternatives to marijuana prohibition. They have not exhausted all the possibilities. Given widespread and growing support for marijuana legalization, bolstered by demographic developments that contributed importantly to your re-election, this movement will almost certainly continue, quite likely at an accelerated pace. Many parts of the country will choose some form of legalization, while other parts will remain adamantly opposed for the foreseeable future. Whichever route voters choose in the future, they will benefit from observing the results of varied experiments in other locales. This can equip them for a “race to the top” as they seek to establish regulatory regimes that strike the most efficacious balance between individual freedom and constraints required for the good of the community.

Obviously, this recommendation faces the same obstacle as discussed in Recommendation 1.1—the conflict between popularly chosen regulatory regimes and long-established federal law. Until federal law changes, and it is far more likely to follow than to lead, a “lowest priority” approach should serve your administration and the nation much better than a heavy-handed attempt to overthrow the expressed will of entire states. Your administration’s aggressive assault on state-licensed medical marijuana operations has surprised and disappointed millions of people who had expected a more realistic and progressive response. As the movement to reject marijuana prohibition becomes

increasingly widespread, it would be unfortunate if obstinate resistance is allowed to leave a lasting stain on your administration and its legacy.

Sterile Syringes for Injecting Drug Users

Background

The United States has a serious blood-borne disease problem. The two most important of these diseases are HIV/AIDS and hepatitis C. Treatment of these widespread diseases is enormously expensive—more than \$300,000 in lifetime costs for a single case of either disease, much of which is covered by taxpayer funds. The sharing of needles by injecting drug users (IDUs) contributes significantly to the spread of these diseases. Extensive worldwide and long-term experience with needle-exchange programs, which enable IDUs to exchange used syringes for sterile ones, are a proven means of significantly reducing the spread of these diseases.

American medical and public health personnel overwhelmingly support making sterile syringes available to injecting drug users. During the 1990s, the U.S. government funded several studies of syringe-exchange programs (SEPs), including an extensive literature review of almost 2000 U.S. and foreign research reports. Key governmental and professional bodies, including the National Academy of Science, the Centers for Disease Control, the American Medical Association, The Institute of Medicine, the National Institutes of Health, the American Public Health Association, and the American Bar Association, have conducted studies and issued reports on the topic of access to clean needles. Without exception, these studies and organizations have endorsed access to clean needles as an effective measure for reducing the incidence of blood-borne diseases and increasing access to treatment for drug users. In addition, they have persuasively documented the important finding that access to sterile needles neither encourages people to start injecting drugs nor increases drug use by those who are already users. Moreover, they take millions of potentially contaminated needles out of circulation instead of leaving them to be passed around or left in parks or public restrooms, where they could injure or infect children and others, including health workers and police who might receive needle-stick injuries in their contact with addicts. Finally, the cost-benefit is extraordinary, in terms of money saved by not having to access the health care system or rely on insurance for medical services because the services are not needed, not to mention the personal and social damage that is avoided by people now harming themselves and their partners—just by providing a clean needle that costs less than a dime.

Recommendation 2.1: Remove the ban on the use of federal funds to programs and projects that provide sterile syringes to injecting drug users as a proven means of reducing the spread of blood-borne diseases such as HIV/AIDS and hepatitis C.

Syringe exchange is an accepted part of public health programs in almost all countries of Western and Eastern Europe, Central Asia, and Australia and New Zealand. Even in Iran, the hyperconservative ruling mullahs have approved of syringe exchange as a way to fight

an HIV/AIDS epidemic spread mainly by drug users. Forty-nine states and the District of Columbia allow some form of syringe exchange, but resistance to funding at federal, state, and local levels has hampered the success of SEPs in some areas.

In 2009, the 111th Congress lifted a long-standing ban on the use of federal funds for SEPs in the FY2010 Consolidated Appropriations Act. In December 2011, however, ideological opponents to SEPs in the 112th Congress reinserted that ban in the FY2012 omnibus spending bill. The 2013 budget proposal includes reinstatement of such funding. We urge the administration to contend strongly for this eminently sensible and compassionate measure.

Recommendation 2.2: Authorize federal funding and encourage other forms of governmental and nongovernmental funding for programs that increase the availability of sterile syringes to injecting drug users.

As of 2011, approximately 200 SEPs operate in the United States. Some are legal; some are not. Some do little more than exchange needles, while others provide various ancillary services and make significant efforts to link addicts to treatment programs.

Although they save far more money than they cost, needle-exchange programs do cost money—for staff, facilities, utilities, and, of course, for needles and other items dispensed to clients. Some programs are well-funded; many, perhaps most, operate on shaky financial ground. Lack of federal money and reliance on volunteer staffers make their existence precarious.

Funding SEPs is economically sound. Many people infected with these diseases receive little or no medical treatment, but for those who do, Medicaid or other public funds bear a high proportion of the cost. The net savings for each case of HIV prevented is approximately \$300,000, with a similar figure for each case of hepatitis C prevented. Preventing just one case of either disease would save far more than the annual cost of a first-rate needle exchange program.

Recommendation 2.3: Allow funds from the President's Emergency Plan for AIDS Relief (PEPFAR) to be used to provide sterile syringes to injecting drug users.

Despite the scientific evidence, PEPFAR has not funded SEPs, even in countries where IDUs account for a much larger proportion of HIV/AIDS cases than in the United States. In some areas, including Russia and its former satellite countries and significant parts of Asia, injecting drug use is believed to be the primary cause of an explosive growth in HIV infections.

All of the arguments listed above apply at least as strongly to funding of SEPs under PEPFAR. In addition, since people and many of the affected countries have little chance of receiving the kind of treatment available in the United States, prevention is even more important.

Conclusion

No responsible person wants to encourage drug abuse. No fiscally prudent person wants to waste money simply to satisfy a sense of righteous indignation. No compassionate person wants to consign people unnecessarily to death or a living hell. Fortunately, providing injecting drug users with access to sterile syringes allows us to be responsible, prudent, and compassionate— admirable criteria for good public policy.

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U.S. Natural Gas Policy: Recommendations for the President

By Kenneth B. Medlock III, Ph.D.

Overview

The view of natural gas has changed dramatically in only 10 years. Most predictions were for a dramatic increase in liquefied natural gas (LNG) imports to North America, which in turn triggered large capital investments in vertically integrated structures to move LNG to the United States from distant locations in the Middle East, Australia, West Africa, and Russia. However, small independent producers in the United States began to apply new techniques to extract natural gas from shale. The success of that entrepreneurial endeavor has resulted in sustained productivity improvements, attracted capital from major oil and gas companies and international investors, and triggered a paradigm shift that now has U.S. producers considering exports of LNG. In light of this, we have the following recommendations, which we expand on below:

- **Recommendation 1:** Introduce a nominal tax that will explicitly fund regulatory oversight of domestic energy development in an adequate manner.
- **Recommendation 2:** Increase federal involvement in ensuring the safety and adequacy of our nation's natural gas transportation infrastructure. This focuses not on interstate transportation, but more specifically on local distribution systems and how they are operated and maintained.
- **Recommendation 3:** End subsidization of technologies in end-use. Instead, redirect efforts into basic research and development (R&D) efforts so that breakthroughs can ultimately facilitate commercially successful energy technology deployment.
- **Recommendation 4:** Do not interfere with market-oriented allocation of capital-to-natural-gas related projects.

Background

The past decade has seen rapid development of technology allowing the recovery of natural gas from shale formations. Beginning with the Barnett shale in northeast Texas, the application of innovative new techniques involving the use of horizontal drilling with hydraulic fracturing has resulted in the rapid growth in production of natural gas from shale. Moreover, the techniques that have proven so successful in the Barnett shale have been successfully applied to other shale formations, including the Marcellus shale, Haynesville shale, Fayetteville shale, Eagle Ford shale, and elsewhere. In fact, success has

been so dramatic that the Barnett grew to become the largest single production play in the United States by 2008, then was surpassed by the Haynesville in 2011, while growth in the Marcellus threatens overtake both within the next two years. In sum, shale gas production in the United States has increased from virtually nothing in 2000 to more than 10 billion cubic feet per day (bcfd) in 2010.

Rising shale gas supplies have significantly reduced current and projected requirements in the United States for imported LNG. Moreover, if not disadvantaged by government policy, natural gas will likely play a very important role in the U.S. energy mix for many years. Of course, the fact that shale gas resources are generally located in close proximity to end-use markets is both a blessing and a curse. On the one hand, the fact that shale gas resources are located near large end-use markets means that development can benefit industry, and facilitate the generation of electricity and the heating of commercial and residential establishments at a relatively low cost. In short, it offers both economic and security of supply benefits. On the other hand, being close to end-use markets raises the specter of public opposition, which can be detrimental to development opportunities. However, in most regions opposition has not severely hindered development as U.S. shale gas production is now well over a quarter of domestic production, up from less than 2 percent less than 10 years ago.

As argued in the study “Shale Gas and U.S. National Security” by Kenneth Medlock, Amy Myers Jaffe, and Peter Hartley in 2011, rising production from shale resources has implications for both domestic and international market structure as well as geopolitics. In Europe, shale gas developments in the North American gas market have, by displacement, increased the availability of LNG, which has played a key role in the ongoing renegotiation of long-term oil indexed contracts. Russia has had to allow a portion of its sales in Europe to be indexed to spot natural gas markets, or regional market hubs, rather than oil prices. This change in pricing is a major paradigm shift.

In Asia, shale gas developments have, again by displacement, released supplies to be shipped to Japanese buyers in the wake of the 2011 nuclear disaster at Fukushima. Absent North American shale developments, LNG spot prices would likely be even higher as global competition for supplies would be more intense. In addition, upstream developers are now investigating opportunities to develop shale resources in Europe and Asia, which could have even more significant and direct long-term impacts on regional gas markets.

In sum, while many analysts have characterized shale in North America as game changing, it could be even more transformative in Europe and Asia. Shale developments in the United States are potentially market-structure altering. The existence of viable shale gas resources is evident in other regions around the world, and shale gas potential is being actively discussed and explored in Europe, China, India, Australia, Argentina, Brazil, South Africa, and elsewhere. The sheer size of the global shale gas potential could alter geopolitical relationships and exert a powerful influence on U.S. energy and foreign policy.

Despite the apparently positive outlook, it is important to point out that sustained, rapid development of shale gas in both the U.S. and abroad is not a certainty. A stable regulatory environment is critical to achieving the potential benefits outlined above. Of prime concern are environmental issues regarding the use and potential contamination of potable water. These sorts of issues must be addressed before the full benefit of shale can be realized.

Market structure is also very important when considering the growth opportunities for shale, and it is likely the most underappreciated factor that positively benefited growth in shale gas production in the United States. The small, independent producers are the upstream participants who drove the entrepreneurial efforts that led to the large increases shale gas production—not the large, integrated majors. Arguably, the entire conversation about shale gas would not be occurring had independent producers not taken the first steps into this new frontier, and they could not have done so absent the market structure that exists in the United States. For example, in the U.S. natural gas market, ownership of transportation capacity rights is unbundled from pipeline ownership. Unbundling of capacity rights from facility ownership makes it possible for any producer to access markets through a competitive bid. Many of the small producers that first ventured into shale might not have been otherwise willing to do so, specifically because access to markets could have been limited. By contrast, in most other markets globally, pipeline capacity is not unbundled from facility ownership—meaning large incumbent monopolies can effectively present barriers to entry through control of the transportation infrastructure.

More generally, the United States has a well-developed, competitive regulatory framework governing natural gas infrastructure development, transportation services, marketing, and mineral rights. This has promoted the rapid development of shale resources; it may not be fully or quickly replicable where government involvement in resource development and transportation is more prevalent. This could prevent market entry by large numbers of smaller producers who would be otherwise willing to test and prove concepts on a small scale. It is for this reason that U.S. energy security has benefitted from having an active sector of small, independent energy companies. Without this sector, U.S. shale gas production would likely have taken many more years to grow to its current levels. Of course this would have meant the LNG regasification terminals that were constructed in the last several years would be more greatly utilized, but it would also have yielded more market and geopolitical power to a few foreign natural gas suppliers.

Recommendation 1: Introduce a nominal tax that will explicitly fund regulatory oversight of domestic energy development in an adequate manner.

The State of Pennsylvania is a good example of how this can be of benefit. The recent rapid increase in drilling activity there exposed the fact that the state regulator did not have the staffing or capability to appropriately manage the permitting and inspection required in the wake of the growth in interest in the Marcellus shale resource. This, not surprisingly,

led to a great deal of public concern. The state responded by levying a tax that was used to fund agency growth. Going forward, the state now seems better prepared to manage the development of its resource wealth. At the federal level, the Environmental Protection Agency and its regional offices are being increasingly taxed to keep up with the rapid pace of development. Thus, a relatively small tax levied specifically to fund agency growth could go a long way toward alleviating public concern about a lack of proper oversight and ensuring safety.

Moreover, environmental oversight can be funded top-down to state agencies through this tax mechanism through transfer payments. This would leave regulation in the hands of the states but give the federal government a funding mechanism to ensure proper levels of oversight are maintained.

Recommendation 2: Increase federal involvement in ensuring the safety and adequacy of our nation's natural gas transportation infrastructure. This focuses not on interstate transportation, but more specifically on local distribution systems and how they are operated and maintained.

There are also issues with regional pipeline infrastructure, which must be adequately maintained. Much of this is outside of federal jurisdiction and is in the hands of state regulators; an example is the infamous San Bruno pipeline explosion in Northern California. But much of the methane escape, which is a potential immediate safety concern if it accumulates, that occurs in the transportation infrastructure occurs in older, not-as-well-maintained parts of the system, namely the local distribution network. At the core of the matter is the fact that incentives for the development and maintenance of long-haul interstate pipelines are very different from the development and maintenance of local distribution and intrastate infrastructure. The Federal Energy Regulatory Commission (FERC) and Department of Transportation, which oversee interstate infrastructure-related issues, have little to no jurisdiction in matters related to intrastate and local distribution infrastructure. Thus, we propose an oversight review function for FERC. This need not result in any binding ruling of commitment, but it would expose local issues and elevate transparency. This serves to promote safety, and it addresses an important point of concern raised by many environmental groups related to methane emissions resulting from growth in natural gas production domestically. The simple act of increasing transparency could pressure state public utility commissions to act more aggressively in ensuring our nation's gas delivery infrastructure is up to proper specification. This is critical if we are to achieve full realization of the potential economic benefit our nation's resource.

Recommendation 3: End subsidization of technologies in end-use. Instead, redirect efforts into basic R&D efforts so that breakthroughs can ultimately facilitate commercially successful energy technology deployment.

Too often policy focuses on deployment of technologies that are not commercial on their own. While there may be real benefits associated with doing this, the costs are ignored

in order to argue the appearance of an a priori net gain. This is critically evident in renewable generation technologies such as wind and solar. While each will ultimately have to be relied upon, they are only now commercially viable with subsidy or in niche applications. Moreover, the subsidies come at the expense of the taxpayer and consumer, while market participants must deal with the inadequacies of the technology, such as intermittency, which ultimately result in inefficient capital redundancy in the power generation grid, i.e., “backup” generation.

The recommendation here is to focus on basic R&D such as commercial scale electricity storage. This would not only solve the intermittency issue associated with renewables, it would also benefit the allocation of capital into power generation by removing the need for as much peaking forms of generation. This capital could then be allocated into other growth endeavors.

A simple analog is useful here. The current shale gas revolution in the United States has its roots in a Carter administration project known as the Eastern Gas Shales Project (EGSP). Geologists have long known about shale resources; the issue was always with technical and commercial recoverability. It is arguable that without the basic lessons of the 1980s and 90s in the upstream that are tied to the EGSP and carried forth by groups like GRI, the shale gas revolution might not have ever occurred. The key point here is that sometimes the gains from basic research do not reveal themselves until well into the future, in this case a 20+ year lead. But without the initial foray, the benefits may never be reaped.

One final point is that such a strategy is less costly right now given the abundance of natural gas. It provides a low cost bridge to a point when real breakthroughs are made and the commercial success of new technologies can be realized without government support.

Recommendation 4: Do not interfere with market-oriented allocation of capital to natural gas-related projects.

A major issue currently being discussed is whether or not LNG exports should be allowed from the United States. Of chief concern is the price impact of allowing exports, and what the concomitant impact would be on the domestic industrial base. In effect, the entire debate is about how to distribute the rent associated with an abundance of low-cost natural gas. The United States does not have a national energy company, nor should it. In fact, we have demonstrated that national energy companies are generally less efficient than publicly traded firms, with few exceptions. As such, how resources are used has not ever really been a sustained emphasis of policy. In fact, in times it has been a focus (for example, oil import policy in the 1970s), the policy ultimately failed because it places an arbitrary constraint on the market outcome. The bottom line is that gains from trade are real. And, if they are present, any constraint on their realization is net welfare reducing. Some groups will lose, but the net gains should be the focus of government rather than the performance of any single entity in the U.S. economy. Thus, we propose that industry

should be given the right to allocate its capital in the best manner it sees appropriate. Certainly, this will lead to some ex post unprofitable investment. In fact, we have argued that not much LNG will ultimately be exported from the United States longer term, but the market, in this way, is self-correcting.

By extension, this also suggests that the government should avoid policies that promote any particular technology. Such policies amount to picking winners. Government support distorts incentives and potentially inhibits longer term gains. This includes the promotion of CNG vehicles. Currently, adding CNG and LNG vehicles into fleets is a commercially viable option, and in fact fleet owners are doing this. This comes about because the fuel savings more than compensates for the differential fixed cost in high use vehicles. The standard private passenger vehicle requires subsidization to be cost effective, largely due to their lower mileage compared with fleet vehicles. A subsidy become increasingly problematic if it promotes large-scale adoption because it begins to erode the tax base associated with gasoline sales, which funds our roads and bridges, and it becomes increasingly expensive due to greater penetration. Thus, it is not a sustainable policy.

Conclusion

The bottom line is to allow market mechanisms determine the allocation of capital and penetration of new technologies. Longer term goals can be sustainably achieved if basic R&D is undertaken and funded through modest taxes on energy development and use. Moreover, the development of domestic resources can be done safely and effectively with proper oversight, but agency funding must be tied directly to development activity through taxation. This would go a long way toward allaying public concerns about future development of shale gas and light tight oil because the government would be well situated to properly and transparently regulate the industry.

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Immigration Reform: A Comprehensive vs. Piecemeal Approach

By Tony Payan, Ph.D.

Overview

The 2012 elections sent a clear message from the American public in general and the nation's Hispanic community in particular: the time is now for immigration reform. However, it is not clear whether the political will or the momentum needed to carry out comprehensive reforms exist. We argue that neither is present, but progress can be made in any case. The key is the approach employed to achieve reforms. We advocate a system whereby targeted strategies are implemented for a range of immigrant populations with irregular legal status. We also propose separate measures to address the U.S. visa system, with the goal of responding more effectively to an eventual economic recovery and future labor demands. While the conditions for comprehensive immigration measures are not present, it is possible to achieve reforms through a piecemeal approach.

- **Recommendation 1:** Reintroduce the DREAM Act.
- **Recommendation 2:** Allow adult children of undocumented immigrants to petition for the citizenship of their parents and siblings.
- **Recommendation 3:** Modernize the pardon process to reunify families.
- **Recommendation 4:** Review the visa system to expand visa types.
- **Recommendation 5:** Reconceive the E-verify system within the larger visa system.
- **Recommendation 6:** Devote greater resources to immigrant processing.

Growth of Undocumented Residents in the United States since 1986

The total unauthorized resident population of the United States has steadily increased since 1986, when the U.S. Congress passed the Immigration Reform and Control Act. The Department of Homeland Security (DHS) estimated the 2009 unauthorized resident population at about 11 million. The number of unauthorized residents very likely peaked in 2007 at 11.8 million, according to the same estimates, and has since been decreasing, though seems to have held steady at just below 11 million.¹ Nearly half of all unauthorized immigrants arrived in the U.S. with temporary nonimmigrant visas, which they overstayed; the other half crossed between ports of entry. Using DHS numbers, the unauthorized population represents about 3.5 percent of the total U.S. population. The cold numbers, however, do not reflect the complex issues behind the immigration predicament that confronts American society and Congress today.

Millions of unauthorized residents have now formed families and laid deep roots in their social, economic, and cultural environments. Some came to the United States as young children or infants and have known no other country. The overwhelming majority of unauthorized migrants are otherwise law-abiding, taxpaying, model residents, and few engage in criminal activities.

Current U.S. policy on unauthorized migrants is largely focused on law enforcement, with particular emphasis on immigration deterrence at the border and unrestricted deportation for those already in the country. This policy results in the separation of families, an increase in the detained and imprisoned population, and the criminalization of millions of individuals. It is counterproductive in that it does not consider the long- and medium-term labor needs of the U.S. The growing tragedy of family separations by deportation is one of the most shameful byproducts of current policy. The frustration of many employers who face stiff penalties for hiring undocumented workers in response to the unwillingness of American citizens to take up undesirable jobs is growing.

This paper aims to aid policymakers forge a stronger and more sustainable immigration system by analyzing the changing landscape of immigration in the United States and what it means for immigration reform.

The Push-and-Pull Forces of Immigration

Seen through the prism of a recovering U.S. economy, immigration reforms become even more crucial. An economic recovery means more jobs, which will attract workers from Mexico and Central America. However, it is important to realize that the great wave of Mexican migration may be over and the number of Mexicans moving to the United States will slow. Several factors account for this. First, Mexico's birth rate is currently at 2.27 children per woman and dropping fast. It may soon reach replacement level and within two decades Mexico may find itself in need of migrant workers for its own economy, which continued to hum along as the United States experienced a recession. At the same time, the U.S. birth rate is 2.5, barely above replacement level. Second, Mexico's economy is growing at approximately 5 percent per year and, if the Peña administration manages the important reforms—labor, energy, education, justice, and anti-corruption—being negotiated, its rate of growth may go even higher, absorbing most of the new workers entering the labor market in Mexico. Third, the Mexican middle class is growing and most will not likely seek to move without authorization but may seek legal migration alternatives instead. The Mexican middle and upper classes, however, will not seek low-skilled and service jobs. In fact, Mexico's middle class may join the millions of tourists and shoppers who already travel to U.S. cities seeking leisure activities.

This does not mean that the push forces of migration will soon be exhausted. Many Mexicans live below the poverty line and some will still be attracted to higher wages in the United States. But the more likely source of unauthorized workers will be Central America, particularly Guatemala, El Salvador, and Honduras. Whereas Mexican migration

is net zero, Central American migration has continued, even though Central Americans not only face the difficulties of crossing the U.S.-Mexico border, but also the exhausting, perilous and often inhumane journey through Mexican territory.

The respite in unauthorized migration from Mexico presents a unique opportunity to reform the immigration system in a way that will attract the workers the U.S. economy will need. The question is how to achieve reform and prepare today for periods of prosperity tomorrow.

A Changing Landscape: Opportunities for Reform

Immigration flows down

The shifting conditions that could represent an opportunity for immigration reform are linked to the dramatic decrease in cross-border unauthorized flows. There are several reasons why the flow of undocumented migrants has decreased in the last five years. The first is the tougher measures to contain the flow of unauthorized migrants. During the 2010-11 fiscal year, the number of migrants detained at the border stood at 327,577, well below the nearly 1.6 million in 2000. This means that the U.S. government has much better control on border flows, Congress can feel reassured that much has been done in regard to the border, and that it may be time to devise ways to allow and control migrant flows in a legal and orderly way.

The border is secure (although we don't know why)

One of the greatest myths about immigration is the idea that the U.S.-Mexico border is an insecure place. The facts belie this myth. Statistics show that the border counties and cities rank consistently among the safest in the nation. For example, the murder rate is well below the national average. There is also no evidence of a serious spillover of violence from Mexico, even at the height of violence in cities like Tijuana, Ciudad Juárez, and Nuevo Laredo. Much of the violent crime in border counties and cities is more closely related to the poverty conditions of the border than the violence in Mexico or the illegal flow of drugs across the border.

A change in public opinion on immigration

American public opinion overall is changing in favor of immigration reform. Sixty percent of Americans today, according to a Chicago Council on Global Affairs survey, believe that the presence of unauthorized migrants in the country is not a critical threat to the United States and may now favor a path to legalization for unauthorized workers already present in the country. Perceptions on immigration as a national threat have declined by 32 percentage points, indicating that the public's mood may be shifting in favor of changes that include regularizing the status of unauthorized migrants as well as a more flexible immigration system.

The vulnerability of migrants at home, in transit, and abroad

Central Americans have become one of the most vulnerable immigrant groups. Not only do they now represent the largest group of migrants to the United States but they

also have to traverse through Mexico, facing possible human rights abuses. Both the Mexican and the American governments now recognize that this situation is inhumane and civil society organizations are lobbying to ensure that these migrants do not suffer these abuses. There is also an implicit recognition that the U.S. economy will need these workers and that ways must be found to allow for an orderly flow of Central American migrants to the United States and, eventually, Mexico. An easier pathway for these migrants would end many of the abuses they endure on their journey and reduce the ability of organized crime to extract resources from them. Thus, the awareness of the human rights abuses that many migrants suffer constitutes an additional argument to push for an immigration system that restores a legal, circular migration in which workers go to work and return home when they are ready to do so. Such a system weakens the power of organized crime to victimize unauthorized migrants.

Costs of enforcement and potential savings

Heightened awareness of the federal budget deficit has brought renewed attention to the costs of immigration law enforcement. Immigration opponents often point to the costs of keeping unauthorized migrants in the United States, but they seldom refer to the costs of keeping immigrants out. According to a report from the United States Sentencing Commission, immigration cases now make up 34.9 percent of all cases in federal court, well beyond the 29.1 percent of drug-related cases. This uses billions of dollars of resources and valuable time from federal agencies, prosecutors, and judges. The amount is in addition to the billions of dollars the federal government spends in various federal agencies—including the 21,000-member Customs and Immigration Enforcement (ICE) and the 22,000-member Border Patrol (BP). Hundreds of millions more are invested in operations, investigations, new technology, physical barriers, and detention facilities. The FY2012 budget provided resources approaching \$20 billion for just these two agencies, while the number of detained unauthorized migrants at the border has dropped to record low levels. In addition, unauthorized migrants caught a second or third time are now being sentenced to prison terms of several years, further straining public budgets, as each bed in prison costs much more than simple deportation.²

Nonprofit organizations are beginning to see ways in which substantial savings could be made by reforming the immigration system and reducing the enforcement apparatus. This approach to immigration reform opens an opportunity to sway budget hawks to support such measures.

Comprehensive Immigration Reform vs. A Piecemeal Approach

It is clear there are important changes in the facts that surround the debate on immigration. The question is not whether it is time or not for immigration reform, but what is the best strategy to carry it out. Should the administration work toward comprehensive immigration reform or take a piecemeal approach?

In spite of lower migrant flows, changing public opinion, rising Latino political power, and public awareness of the personal tragedies of migrants and their families, the conditions for a grand bargain, better known as Comprehensive Immigration Reform (CIR), do not exist. Though there is no consensus on how to fix the system, all sides of the issue agree that the immigration system is in need of deep reforms. This suggests that resolving the immigration crisis will require a piecemeal approach. Targeted solutions for specific parts of the problem are more likely to lead to productive congressional debates on the immigration system than an attempt to resolve multiple issues in an overarching comprehensive reform measure.

A piecemeal approach will allow Congress to address different issues in the immigration system and ease pressure on the overall crisis. It will also allow vulnerable members of Congress to take cover from constituents who may oppose comprehensive immigration reform. On the downside, a piecemeal approach may result in the resolution of certain complicated aspects of the immigration system but eventually leave others issues unresolved.

This author recommends that comprehensive immigration reform not be attempted again. Instead, the immigration issue should be resolved in a series of acts that allow Congress to debate specific populations, resolve specific problems, and then move on to modify the immigration system to respond to the needs of the U.S. economy in the future.

The Facets of Reform: Policy Recommendations

Recommendation 1: Reintroduce the DREAM Act

On June 15, 2012, President Obama announced the Deferred Action for Childhood Arrivals (DACA) program, which went into effect on August 15, 2012. The measure is largely seen as the administration's response to Congress' inability to pass the DREAM Act, which was designed to regularize the situation of an estimated 1.6 million young persons brought to the United States without proper documentation by their parents. DACA, however, is not a substitute for the DREAM Act. A version of the DREAM Act must be reintroduced. The DREAM Act must grant full legal permanent resident (LPR) status to those who qualify, and then deport only those who incur serious violations of the law. If the DREAM Act is passed, the DACA numbers suggest that the overall unauthorized population would be reduced by about 12 to 14 percent, and these young people who know no other home than the United States would be fully integrated into the American mainstream society, to which they are very likely well-adjusted.

Recommendation 2: Allow adult children of undocumented migrants to petition for the citizenship of their parents and siblings

During the first half of 2012, some 45,000 parents of American children were removed from the United States, leaving their U.S.-citizen children in the care of a single parent, or under the custody of Immigration and Customs Enforcement and eventually in foster care. The U.S. immigration system is primarily predicated on family reunification. This

same principle can be applied to resolve the legal situation of several million unauthorized migrants. This author advocates allowing U.S. LPRs and citizen children of unauthorized migrants to petition for their parents before the Bureau of Citizenship and Immigration Services (BCIS) from within the United States.

Recommendation 3: Modernize the pardon process to reunify families

The unauthorized population is always in danger of being removed from the United States. Quiet tragedies are repeated every day, as parents are handcuffed and whisked away to deportation proceedings by ICE, often handing over their children to a social worker. Deported persons are deprived of all rights to return to the United States. After the September 11 attacks, the penalties for deportees and removed aliens were tightened even further. Criminal deportees, for example, are barred from entering the United States for life. Noncriminal deportees are barred from entering the United States for 10 to 20 years. Unfortunately, the system also punishes their families, who are left without their loved ones. Noncriminal deportees, however, can return to the United States after they have stayed outside the United States for the time of the penalty and not attempted to cross without documents again; but they must apply under an “admission after deportation/removal” process. This process for admission should privilege family reunification. Noncriminal deportees could be allowed to apply to return to the United States, if the basis for their return is family reunification and they have stayed out of trouble with the law. This process would involve a clear demonstration of family reunification, appropriate fines and penalties, and processing fees. Such returns have been granted in the past for humanitarian reasons. It is time to have a clearer, more flexible administrative process for family reunification after deportation.

Recommendation 4: Review the visa system to expand visa types

In general, there is very little room in the current U.S. visa system for the types of workers that make up the majority of the unauthorized working population—i.e., workers who tend to occupy jobs in the construction, landscaping, and service sectors.³ Congress should create a new type of visa for workers who can fill these types of jobs or, alternatively, a visa that invites them as guest workers during peak economic times.

The border has a highly integrated labor market that has not been recognized in the U.S. visa system. The border labor market includes day laborers, maids, day care workers, and others who cross the border with B1/B2 visas to work at very low cost to U.S. citizens and residents. The presence of these workers should be acknowledged and visas for this class of workers should be created. These visas do not have to be permanent immigrant visas, but rather, be work permits as petitioned by border employers and according to certain renewal guidelines that pay close attention to the needs of border workers.

TN visas, for NAFTA professionals, should be expanded to include the integration of North American workers. Part of the reason Canadians and Mexicans do not apply for TN visas is because they are for skilled professionals. TN visas should be extended to include service workers either on a permanent migration path or in a temporary guest worker

program. This visa could be modified to allow the unauthorized population to find a path to employment in the sectors that most require them, with eventual settlement in the United States. Employers in certain sectors (such as tourism, construction, food services) who do not have a way to petition for their employees should be allowed to do so on a permanent or a temporary basis—much like industries that require highly skilled labor are allowed to petition for the kind of workers they need. This fundamental change to the visa system would recognize that North America requires a new framework for labor mobility in the face of declining birth rates throughout the continent. This would have an additional effect on criminal organizations that smuggle humans across the border. It would also prevent many deaths in Southwest deserts and restore not only a path to work, but also human dignity to the millions of workers for whom the only route is illegal.

Recommendation 5: Reconceive the E-Verify system within the larger visa system

Since the immigration reforms of 1986, the U.S. government has slowly shifted part of the burden of immigration enforcement toward employers. At one time, employment eligibility was established by requiring every employee to complete an I-9 form certifying his or her eligibility. In case of an audit by immigration authorities, the employer would be fined for every unauthorized worker who filled out an I-9 form. Later, a computerized database was put into place that presumably corroborated an applicant's employment eligibility. This system, known as E-Verify, was introduced in 1997. E-Verify, however, has proven costly and inaccurate. Common errors include certifying the employment eligibility of workers who are not in fact authorized and erroneously rejecting U.S. citizens and permanent residents who are authorized to work. The E-Verify system has not forced any workers to leave the country and has instead driven many employers and workers underground into a kind of informal economy. E-Verify is also costly, as employers have to spend time processing workers and then attempting to correct the system's errors. The Government Accountability Office has called the system "minimally credible."

A more flexible visa system, indexed to U.S. economic performance, is more likely to be effective while saving the federal government billions of dollars. E-Verify should be discarded in favor of a new visa system that better responds to the future labor needs of the United States.

Recommendation 6: Greater resources for immigrant processing

The current approach to solving the immigration crisis is lopsided. It relies primarily on law enforcement, without serious consideration of the future of the U.S. economy or the types of workers that will be required in a recovering economy. The United States should index the number and type of worker visas to U.S. economic performance and allocate resources to resolve a visa processing backlog that has become a permanent fixture of the U.S. immigration system.

There are two ways to recover the resources required to speed migrant processing. First, each visa should reflect the cost of its administrative processing. This, however, can be

taxing on many migrant families; therefore, families should be allowed to pay these fees, which can amount to thousands of dollars, in installments over a reasonable period of time. Second, the resources allocated to local police departments through 287(g) should be channeled to the Bureau of Citizenship and Immigration Services for the purpose of expediting visa processing. This would end the deputizing of local police forces as immigration enforcement officers and restore much of the trust lost between local migrant communities and the agencies that are supposed to protect them.

Conclusion

The past few years have seen important shifts in the immigration landscape. Immigration flows are down; there is a much greater sense of control at the border; the Hispanic population has clearly signaled at the polls that the immigration system must be fixed; a shift in U.S. public opinion offers greater possibilities for compromise; and the vulnerability of unauthorized migrants, particularly Central Americans, has become a moral scandal. These important variables add up to a more favorable setting to pursue immigration reform. Immigration reform, however, must deal with an array of factors tied to the past, the present, and the future. And there may not be enough political will to push a comprehensive immigration reform through Congress. Reforms may best be achieved through a piecemeal approach, one that segments different populations and issues. This will allow the administration to tackle each issue individually. A piecemeal approach is also likely to provide hesitant members of Congress the opportunity to take cover from constituents opposed to comprehensive reforms.

The proposals put forth here to overhaul and modernize the immigration system include:

1. Passage of the DREAM Act to address the situation of the young, particularly those who qualified for DACA. This would resolve the status of 1.6 million of the 11 million people currently living in the United States without authorization.
2. A path to legal status for those who are already here, who are employed, and who have stayed out of trouble with the law. One method to accomplish this is to allow their U.S. citizen adult children to petition for them. This proposal would resolve the status of several million additional workers.
3. A measure that provides for the reunification of families. This proposal, of course, is likely to be controversial because it involves the potential return of a number of deported individuals; however, their U.S. citizen children, without family support, could grow up to be a burden to the system and cost more than allowing family reunification now.
4. A plan that addresses the future needs of the U.S. economy. The current visa system is too inflexible, and the U.S. economy in good times produces many jobs that eager-to-work migrants cannot legally fill. This situation can be addressed by indexing the visa system to economic performance and labor needs.

To accomplish these goals, the author suggests that the administration convene a group of immigration experts who can quickly put together a strategy to introduce each proposal at opportune times. This group should have the ability to negotiate openly with members of Congress on the details of the proposals.

If the administration does not take advantage of this opportunity soon, deportations will continue to separate families; criminal organizations will continue to victimize unauthorized migrants willing to risk their lives to enter the United States; and the future needs of the U.S. labor market will not be met as the economy recovers and creates a demand for more workers. The opportunity for immigration reform has not been better in many years. The time to act is now.

References

1,2. The reality is that most estimates will necessarily be quite inaccurate because of the clandestine nature of the phenomenon. The numbers are debatable and may be much higher.

3. Of course, not all of these are low-skilled jobs. In the construction sector, for example, employers spend much time training workers in the installation of complex fixtures and other tasks that require solid qualifications. An employer who cannot find a worker willing to stay with the company after having acquired those skills should be able to petition for trained workers much in the way that other businesses, such as universities, think tanks, research laboratories, etc., are allowed to petition for highly skilled workers, such as engineers, professors, doctors, nurses, etc. A main point is that companies that have spent time and resources in training workers should not have to lose that human capital.

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Climate Change Policy: Recommendations for the Next Administration

By Ronald L. Sass, Ph.D.

Overview

In 2012, two-thirds of our country experienced severe to extreme drought. The period from January–August broke the year-to-date record for most acreage burned by wildfires (6,888,342 acres). In June, Tropical Cyclone Debby produced record-breaking rainfall across Florida, dropping more than 20 inches of rain in 24 hours and the derecho event slammed 700 miles of the United States with violent winds that left 22 dead and millions without power (Somerville and Masters 2012). And in late October, Hurricane Sandy devastated the Mid-Atlantic and Northeastern United States causing an estimated \$50 billion in losses and killing 43 people in New York City alone. It is time that we Americans realize the realities of climate change, and aggressively and seriously respond to them.

The world, after more than 5,000 years of relative climate stability, is now entering a period of rapid climate change—increasing temperatures, rising sea levels, intense storms, floods, and droughts. Climate change is affecting nearly every aspect of the lives of all people and its effects will only intensify in the future. Events of extreme weather this year have again demonstrated that we as a nation are less than fully prepared to deal with these changes. Furthermore, public opinion about climate change, its causes, and its effects is divided, in large part because informed public knowledge about these issues is lacking.

Many states and local governments are advancing ways of slowing down climate changes using methods that are important and worthwhile. Because both the causes and effects of climate change are global, our response must also be global, thereby making climate change a top priority of the federal government.

In order to facilitate this response, the following set of recommendations is proposed as a strategy to elevate climate change to a global priority and accelerate national discourse and action by increasing public understanding and acceptance/support of climate change, reducing emissions of greenhouse gases, and managing and adapting to rising temperatures.

- **Recommendation 1:** Establish a federal policy and governmental infrastructure for climate change that is grounded in the best available science, technical information, and advice in order to direct and coordinate resource mobilization and increase public understanding and support.

- 1.1 Recognize the consensus on the causes and effects of climate change that exists within the scientific community.
- 1.2 Begin a national conversation on climate change with all Americans, led by leaders of the science, business, security, faith, and environmental communities.
- 1.3 Create a Cabinet-level department responsible for the climate change program of the United States.
- **Recommendation 2:** Promote programs and fund research in both the public and private sectors to drive innovation and action that will prepare communities for the consequences of climate change such as extreme weather, forest fires, sea level rise, and floods.
 - 2.1 Strengthen the resilience of our communities to extreme weather events.
 - 2.2 Consider specific, localized-training with the National Guard in combating locally characteristic natural disaster threats.
- **Recommendation 3:** Develop a program for a rational transition from fossil fuel to renewal energy sources.
 - 3.1 Encourage a program in residences and businesses for a more efficient use of energy, fuel efficiency, and mass transportation.
 - 3.2 Reduce pollution from power plants and review regulations on coal-fired plants.
 - 3.3 Promote nuclear power plants as an interim low-carbon source of energy.
 - 3.4 Fund research and development of new and better methods for the storage of energy.
 - 3.5 Establish a carbon tax (or assessment) to reflect the true cost of fossil fuel usage, thereby leveling the playing field significantly and encouraging the development of alternative energy sources.

Background

The quantitative scientific analysis of climate change, although nearly 200 years old, reached an international consensus in 1985 with the declaration from the Villach Conference stating that “in the first half of the next century, a rise of global mean temperature could occur which is greater than any in man’s history” (Bolin 1986). By 2007, the Intergovernmental Panel on Climate Change (IPCC), speaking for the world’s governments and representing scientists from a majority of the world’s countries, reported the conclusion that humans were changing the climate through greenhouse gas emissions (Pachauri and Reisinger 2007). The position statement on the human impacts on climate, adopted in revised form in 2007 by the American Geophysical Union (AGU), begins with the following statement (AGU 2007):

“The Earth’s climate is now clearly out of balance and is warming. Many components of the climate system—including the temperatures of the atmosphere,

land, and ocean; the extent of sea ice and mountain glaciers; the sea level; the distribution of precipitation; and the length of seasons—are now changing at rates and in patterns that are not natural and are best explained by the increased atmospheric abundances of greenhouse gases and aerosols generated by human activity during the 20th century.”

Although much remains to be done to completely understand all aspects of climate change, there is no doubt that the changes in the climate now being observed are consistent with our understanding of the underlying scientific concepts. There is a very strong consensus among all climate scientists, indeed near unanimity, that continued human emissions of greenhouse gases, particularly from the combustion of fossil fuels, are seriously affecting the climate of the Earth in an adverse way. This consensus is sound enough to warrant strong political and economic response to mitigate the causes of these changes and to plan to adapt to the consequences. Some details of this response are proposed in the following recommendations.

Recommendation 1: Establish a federal policy and governmental infrastructure for climate change that is grounded in the best available science, technical information, and advice in order to direct and coordinate resource mobilization and increase public understanding and support.

1.1 Recognize the consensus on the causes and effects of climate change that exists within the scientific community.

To be effective, an American policy on climate change must be grounded in the best science available. The climate science community is in virtual agreement on the causes and effects of climate change, both current and past as well as the future. The National Research Council (2010) has maintained: “Some scientific conclusions or theories have been so thoroughly examined and tested, and supported by so many independent observations and results, that their likelihood of subsequently being found to be wrong is vanishingly small. Such conclusions and theories are then regarded as settled facts. This is the case for the conclusions that the Earth system is warming and that much of this warming is very likely due to human activities.”

1.2 Begin a national conversation on climate change with all Americans, led by leaders of the science, business, security, faith, and environmental communities.

Climate change is potentially a more important problem in the coming decades than World War II was in the 1940s. The massive news blitz then explaining the war involved all available media—radio, stage, screen, newspapers, and magazines. The case for climate change must be communicated to the American public with the same intensity so that people may be correctly informed and ready to accept responsibility for mitigation and have the will for the adaptation necessary to meet the challenge of the changing climate. The consensus for action that exists in the scientific community must be extended to include business, security, faith, and other communities. The president can, through the authority of his office, bring these groups together with scientists in order to foster a

national understanding of the daunting problems facing us with respect to the changing climate and begin to address solutions to these problems. The American public currently shows a growing concern over the increase in extreme weather events and a desire to be better informed about them. For example, a new Rasmussen Reports national telephone survey finds that 68 percent of likely U.S. voters now say global warming is at least a somewhat serious problem, including 38 percent who think it is very serious (National Resources Defense Council 2012).

1.3 Create a Cabinet-level department responsible for the climate change program of the United States.

A viable climate change program by the federal government will, over the next few decades, become bigger than any single existing governmental organization. Its cost will be in the trillions of dollars per year (Natural Resources Defense Council 2008). This fact can best be seen in a discussion of the current climate change budget. In May 2011, the Government Accountability Office (GAO), in a report to the House of Representatives' Committee on Natural Resources (GAO 2011), stated: "Climate change is a complex, crosscutting issue that poses risks to many existing environmental and economic systems, including agriculture, infrastructure, ecosystems, and human health." A 2009 assessment by the United States Global Change Research Program (USGCRP) found that climate-related changes—such as rising temperature and sea level—will combine with pollution, population growth, urbanization, and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.

According to the Office of Management and Budget's (OMB) June 2010 report, nine of the 15 Cabinet-level executive departments, along with seven other federal agencies, received funding for climate change activities in fiscal year 2010. In addition, entities within the Executive Office of the President (EOP) such as the Office of Science and Technology Policy (OSTP) and federal interagency coordinating bodies like USGCRP work together to ensure federal climate change activities are guided by the latest climate science." As the effects of climate change become more apparent and as the cost of extreme weather events grows, it will become increasingly obvious that more and better coordination of efforts to mitigate, adapt to, and pay for climate change will be needed. This same GAO report (2011) finds that: "Federal officials do not have a shared understanding of strategic priorities. This is in part due to inconsistent messages articulated in strategic plans and other policy documents. A 2008 Congressional Research Service analysis had similarly found no 'overarching policy goal for climate change that guides the programs funded or the priorities among programs.'" Second, since mechanisms for aligning funding with priorities are nonbinding, they are limited when in conflict with agencies' own priorities. The analysis then goes on to recommend action options including: "(1) a government-wide strategic planning process that promotes a shared understanding among agencies of strategic priorities by articulating what they are expected to do within the overall federal response to climate change and (2) an integrated budget review process that better aligns these priorities with funding decisions through a more consistent method of reporting and reviewing climate change funding." The solution to these problems would best be

addressed by creating a Climate Change Department, and I believe this should be at a level comparable to that of the Department of Homeland Security.

Recommendation 2: Promote programs and fund research in both the public and private sectors to drive innovation and action that will prepare communities for the consequences of climate change, such as extreme weather, forest fires, sea level rise, and floods.

2.1 Strengthen the resilience of our communities to extreme weather events.

The one-two punch of hurricanes Irene and Sandy has demonstrated that cities in the Northeast are not equipped to cope with the destruction that resulted: flooded transit systems, downed power lines, uncontained home fires, lack of an effective evacuation plan, hospital and nursing homes without power, angry citizens. Many power company distribution systems are out-of-date, replacement equipment is often not available when needed during a crisis, coordination and supervision are frequently ineffective, and the utility may be unduly relying on antiquated technology. Even rudimentary preparations such as trimming trees to protect power lines were often not done. As a result, for example, 90 percent of the 1.1 million customers of the Long Island Power Authority lost electric power during Hurricane Sandy and not all had it restored two weeks later (Hakim, McGeehan, and Moss 2012).

All communities should have a representative organization charged with formulating plans to cope with natural disasters that are possible in their area. A regional or statewide panel should evaluate these plans and a method for funding to carry out recommended strengthening of the community's infrastructure should be required. The various state governments should coordinate and help these local organizations and report the degree of preparedness to the federal government, perhaps through the Federal Emergency Management Agency (FEMA) or a newly created Department of Climate Change. Obviously, these efforts will produce millions of jobs and strengthen the economy as well as harden infrastructure.

2.2 Consider specific, localized training with the National Guard in combating locally characteristic natural disaster threats.

Response to a natural disaster almost always requires the massive importation of manpower. For example, the Long Island Power Authority imported 11,000 workers to restore power after Hurricane Sandy. Some came from as far away as California (Hakim, McGeehan, and Moss 2012). A well-organized manpower response may be difficult to obtain as natural disasters become more intense and wider spread. One solution is to have in reserve a cadre of workers trained for disaster response. If climate change were declared to be a threat to national security, which it is, then it could fall within the authority of the National Guard to respond to climate change-related disasters. Regular training as part of the Guard's requirements would ensure that they would be prepared to carry out their mission in a professional and effective manner. Details of the chain of command between the Guard and local authorities will need to be considered.

Recommendation 3: Develop a program for a rational transition from fossil fuel to renewable energy sources.

3.1 Encourage a program for a more efficient use of energy in residences and businesses, promote motor vehicle fuel efficiency, and expand use of mass transportation.

To promote a more efficient use of fossil fuel is to pick the lowest hanging fruit. A good example of this is provided by the Department of Transportation and the Environmental Protection Agency, who required automakers to raise the average fuel efficiency of new cars and trucks to 54.5 miles per gallon by 2025. This measure alone will save trillions of dollars and reduce greenhouse gas emission by billions of tons (Sunstein 2012). As much as a 30 percent reduction in energy use can be accomplished by more effective insulation of houses and offices, as well as the use of more efficient appliances and fostering higher sun reflectivity of roofs, parking lots, and streets. Smart community planning with efficient mass transit systems will add to the quality of life as well as save energy. All such programs can be sponsored through government-encouraged initiatives with minimal or even negative cost.

3.2 Reduce pollution from power plants and review regulations on coal-fired plants.

Many of the extant coal-fired power plants across the United States are nearing the end of their lifetimes and should either be decommissioned or upgraded to gas to reduce pollution and increase efficiency. Ideally, new methods of reducing carbon emissions will be introduced, such as natural gas, carbon capture and sequestration, and conversion of coal to synfuels.

3.3 Promote nuclear power plants as an interim low-carbon source of energy.

Replacing coal-fired power plants with nuclear power is a useful bridging solution on the road to a carbonless future. However, a substantial increase in the use of nuclear power plants will require the restoration of public confidence in safety and waste disposal, as well as international security requirements governing uranium enrichment and plutonium production. The time between proposing the building of a nuclear power plant and actual power production can easily stretch to between 15 and 20 years. One path for speeding up the process is to agree on a single reactor type for all power production. Development and production applications would be standardized and thus applications would be easier to evaluate. If that reactor type were a breeder reactor, much of the waste disposal problem would also be solved. Required increased security at the reactor site would replace current security needs at waste sites. These problems are solvable but require an educated and informed public that has confidence in their government.

3.4 Fund research and development of new and better methods for the storage and transport of energy.

Currently, electrical energy must be created and delivered on demand. Utility companies do an amazing job making this happen, but the systems are overtaxed and outdated. A major block to the use of wind and solar power is the fact that the wind does not always blow and the sun does not always shine. Research on, and development of, better storage

systems for electricity and larger and more efficient smart grids for the transport of electricity are absolute requirements for a successful transition to wind and solar power. A worldwide grid would be ideal if it were practical. Electricity could be generated anywhere and used anywhere else. A second-best solution would be to run the grid at least across the entire North American continent, starting with the United States. A good first step is Order No. 1000 of the Federal Energy Regulatory Commission (FERC 2012), requiring transmission planning at the regional level to consider and evaluate possible transmission alternatives and produce a regional transmission plan.

3.5 Establish a carbon tax (or assessment) to reflect the true cost of fossil fuel usage, thereby leveling the playing field significantly and encouraging the development of alternative energy sources.

Although the switch from fossil fuel to renewables is intellectually necessary to reduce climate change, the driving force for this change is not scientific but rather, economic. One economic move would be to remove tax incentives from fossil fuel producers and give them to providers of renewable energy forms. That can and should be considered. Another way of encouraging the use of renewable forms of energy is to establish a carbon tax on fossil fuels. Probably the best way of doing this is to assess the cost at the point of production rather than downstream toward the consumer. This removes a good deal of the ambiguity found in some current carbon tax proposals. The tax becomes part of the cost of production and can easily be passed on to distributors and users. Taxing at the source will also make leakage losses of fuel more expensive and thereby help prevent them. I believe that a carbon tax is better than a cap-and-trade plan. Cap-and-trade may or may not reduce carbon emissions. What it does is establish another commodities market that may lead to more abuse than good. The income from the tax can then be used to develop new renewable energy sources, establish funding to promote the development and production of new power transmission systems, and create new energy storage cells.

Conclusions

Heat records are being broken with alarming frequency, droughts and floods are affecting larger areas of the world, and abnormal weather extremes are persisting. As the 21st century begins, the effects of climate change are becoming more and more apparent and are most visible as an increasing occurrence of intense weather events. How do we as Americans respond to the challenges presented by these changes? There are three categories of response to the threat of climate change: mitigation, adaptation, and suffering. The above recommendations to you as our president include both mitigation and adaptation options. They are presented with the hope that through your direct actions and the positive responses, the future suffering of your constituents will be minimized.

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