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Teryn Norris

Senior Advisor, Breakthrough Institute

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Winning the Clean Energy Race: A New Strategy for American Leadership

What's Your Reaction?

You know the world is changing when the president's first trip to Asia is defined by a new U.S. foreign policy dubbed "strategic reassurance" - convincing China that the United States has no intention of containing its growing power or endangering its foreign investments. As the *New York Times* put it, "When President Obama visits China for the first time on Sunday, he will, in many ways, be assuming the role of profligate spender coming to pay respects to his banker."

You also know times are changing when China, the world's greatest polluter, and other Asian nations are poised to dominate the burgeoning global clean-tech industry by out-investing the United States. That's the conclusion of a major new report we co-authored called "Rising Tigers, Sleeping Giant," released this week by the Breakthrough Institute and Information Technology & Innovation Foundation (see coverage in *Financial Times* and *Wall Street Journal*). The report is the first to thoroughly benchmark clean energy competitiveness in four nations - China, Japan, South Korea, and the United States - and finds the following:

"Asia's rising 'clean technology tigers' - China, Japan, and South Korea - have already passed the United States in the production of virtually all clean energy technologies and over the next five years will out-invest the U.S. three-to-one in these sectors... While some U.S. firms will benefit from the establishment of joint ventures overseas, the jobs, tax revenues, and other benefits of clean tech growth will overwhelmingly accrue to Asian nations... Should the investment gap persist, the U.S. will import the overwhelming majority of clean energy technologies it deploys."

What do these two changes have in common? They both reflect the accelerating shift of global power from America to Asia, caused in large part by the serious mismanagement of U.S. economic policy.

The Pacific power shift is not a new phenomenon, and the Obama administration is wise to seek stronger ties with the region. The U.S. should applaud Asia's growth, which is partly an outcome of our own success at promoting economic liberalism and international development. This shift in power is not a zero-sum game, nor should it be: the U.S. and Asia should avoid trade wars at all costs, and we should seize opportunities for partnership on a range of issues, from climate change to nuclear proliferation.

But the growing pace of this power shift should be a cause of major concern for Americans, and it should raise serious questions about our economic policies at the highest level. While the U.S. economy has suffered greatly from a crisis produced by its own financial sector - losing millions of jobs, trillions in economic output, and demanding huge spending packages financed by borrowed money - China has shrugged off the global recession with high levels of growth and self-financed stimulus, all while purchasing billions of Treasury bills to fund a U.S.

deficit that has reached historic highs.

Last November, addressing the nation on the evening of his election, President Obama declared that "a new era of American leadership is at hand." And indeed, his new administration has taken significant steps to remake U.S. foreign policy. But unless the U.S. quickly improves its economic competitiveness, our global leadership will be severely damaged. What is demanded now is a major, coordinated national project to regain our economic competitiveness in strategic sectors while permanently correcting the imbalances that led to the Great Recession.

Correcting Imbalances & Fixing Finance

Speaking at the San Francisco Fed last month, Federal Reserve chairman Ben Bernanke declared it "extraordinarily urgent" that the U.S. and Asia take steps to prevent a revival of global economic imbalances. There is now broad consensus on how these imbalances - the huge gaps in trade deficits and surpluses, and the associated gaps in national savings, consumption, and investment rates - helped caused the housing bubble and the Great Recession. Alan Greenspan offered a concise explanation in a widely-read column this spring:

"The presumptive cause of the world-wide decline in long-term [mortgage] rates was the tectonic shift in the early 1990s by much of the developing world from heavy emphasis on central planning to increasingly dynamic, export-led market competition. The result was a surge in growth in China and a large number of other emerging market economies that led to an excess of global intended savings relative to intended capital investment."

In other words, the U.S. housing bubble was caused in large part by the buildup of savings in emerging market economies, especially China, accumulated from their large trade surpluses. As this large "pool of money" was invested internationally, it drove down the costs of borrowing, drove up subprime lending, and created large demand for mortgage-backed securities. This era of easy credit - combined with the use of "innovative" financial instruments, which relaxed mortgage standards, concealed risk, and enabled the mass packaging and sale of these securities - gave rise to the U.S. housing bubble.

This "global pool of money" wouldn't have existed without the U.S. running an enormous trade deficit, relying on imports and debt to support a high consumption rate - hence the global "imbalance" of high-saving versus high-consuming countries. The U.S. deficit in the trade of goods and services in 2008 was \$695 billion, according to the Department of Commerce, compared to China's surplus of \$297 billion.

Speaking in Tokyo last week, President Obama extended this problem to its logical conclusion, calling for rebalanced growth and a new U.S. economic strategy based on exports: "One of the important lessons this recession has taught us is the limits of depending primarily on American consumers and Asian exports to drive growth... [our] new strategy will mean that we save more and spend less, reform our financial systems, reduce our long-term deficit and borrowing. It will also mean a greater emphasis on exports that we can build, produce, and sell all over the world."

The implication is clear: the United States must shift away from a "financial" economy to an "innovation" economy, one that focuses on creating industries that produce real innovative products to sell around the world. After years of creating imaginary wealth on the pile of sand that was the U.S. financial sector, America must once again get into the business of producing real goods and services. This means reducing the size of the financial sector and the Wall Street "brain drain" - which has distracted the nation's best and brightest minds from the work of real innovation and entrepreneurship - and refocusing on productive, export-oriented industries. And it means adopting a new era of innovation policies to ensure the U.S. economy is the most competitive in the world, directing targeted public investments into strategic technologies, infrastructure, and high-tech education programs.

This new economic strategy is necessary not just for short-term recovery, but for avoiding future credit bubbles and financial crises, slashing our trade and budget deficit, producing more innovative technologies to improve our everyday lives, and regaining our international leadership.

The Clean Energy Race

What's the biggest new industry that can boost America's exports, grow the economy, create better jobs, and tap our innovative potential? In a word, clean-tech.

Here's why: Reducing global greenhouse gas emissions, while simultaneously meeting the surging demand for energy in developing countries, requires the development and deployment of clean energy technologies on a massive scale. Indeed, while global energy demand is expected to double or even triple by 2050, emissions must

fall by at least 80 percent over the same period to avoid the worst consequences of climate change.

Meeting this challenge requires nothing short of a revolutionary shift toward clean energy and a dramatically increased level of investment in these technologies. The International Energy Agency estimates that achieving a 50 percent reduction in emissions by 2050 will require total additional global investments of \$45 trillion. "Rising Tigers, Sleeping Giant" notes that "global private investment in renewable energy and energy efficient technologies alone is estimated to reach \$450 billion annually by 2012 and \$600 billion by 2020, and much larger if recent market opportunity estimates are realized." Recognizing these trends, an increasing number of analysts are calling the clean-tech industry a "guaranteed-growth" sector.

No wonder President Obama has made this his signature statement: "The nation that leads in the creation of a clean energy economy will be the nation that leads the 21st century global economy."

Make no mistake: healthy international competition in the clean-tech industry will not hinder the global transition to clean energy, but rather will act as one of the most powerful accelerators for clean energy development and deployment in the world. International collaboration, such as technology partnerships, will be important to promote clean energy development in China and other developing countries, but we also need to think about how to leverage competitive forces. International competition in the clean energy industry can improve technologies and reduce their price at a rapid pace, and governments can play a more active role in promoting these activities. For example, we should consider establishing an official "U.S.-China Clean Tech Competition" - jointly funded by each country - to promote competition between U.S. and Chinese firms in developing the most innovative technologies and business models.

Unfortunately, the United States is already falling behind its competitors in this critical industry. Just for starters, we rely on foreign companies for the majority of our wind turbines, produce less than 10 percent of the world's solar cells, and we're losing ground on hybrid and electric vehicle technology and manufacturing. China leads the global production of solar cells and wind turbines, and it is expected to become the number one solar market within five years. By 2012, China, Japan, and South Korea are expected to produce 1.6 million hybrid gas-electric or electric vehicles annually compared to North America, which is projected to produce 267,000, less than a fifth as many, according to industry forecasts.

China, Japan, and South Korea plan to gain even greater "first-mover" advantages and solidify this lead with coordinated and comprehensive policies based largely on direct government investment. These governments are expected to invest a total of \$509 billion in clean technology over the next five years, compared to \$172 billion in the United States, assuming passage of the proposed American Clean Energy and Security Act and including current budget appropriations and recently enacted stimulus measures. According to a recent Deutsche Bank report, "generous and well-targeted [clean-tech] incentives" backed by "comprehensive and integrated government plans" in China and Japan will create a low-risk environment for investors and stimulate high levels of private investment.

As John Doerr and Jeff Immelt, two of the country's top business leaders, recently wrote in the Washington Post, "We are clearly not in the lead today. That position is held by China, which understands the importance of controlling its energy future. China's commitment to developing clean energy technologies and markets is breathtaking."

A New Project for Energy Competitiveness

Without a large national project to regain competitiveness in the clean-tech sector, the United States will miss a major opportunity to grow our economy, correct our trade imbalance, and reduce our national deficit. Indeed, even if we transition to clean sources of energy, we risk trading our dependence on foreign oil for dependence on foreign clean energy.

Fortunately, the United States has a history of regaining competitiveness in strategic industries. Decades ago, after trailing Europe in aviation and aerospace, we raced ahead through sustained federal support for aviation technology development. After the Soviet Union launched Sputnik, we invested heavily in education, science, and technology, enabling us to put the first man on the moon and achieve breakthroughs in information-age technology. When the Japanese took the lead in the semiconductor industry in the 1980s, we formed SEMATECH, a public-private partnership that successfully repositioned the U.S. as the global market leader.

What each of these stories has in common is direct public investment in technology innovation and deployment, education, and infrastructure, aimed at generating competitive private industries. Fareed Zakaria explains the primary reasons for America's previous innovation leadership in the current cover story of Newsweek: "The third

tidal wave was massive government funding... After World War II, the Cold War drove this funding to new highs, so that by the 1950s, the United States was spending 3 percent of GDP on R&D, which amounted to a majority of the total spending on science on the planet. Government funding of basic research has been astonishingly productive." (Zakaria cites a report that one of us co-authored called "Case Studies in American Innovation.")

Indeed, the United States did not invent the Internet by enforcing a cap and trade system on fax machines, nor did we create the personal computer by taxing typewriters. Those who suggest we can simply rely on indirect, market-based mechanisms to achieve a clean energy revolution fail to understand the history of technology innovation and competitiveness, and they risk relegating our clean-tech industry to second-class status or worse. Indeed, the same Deutsche Bank report above noted that the U.S. is a "moderate-risk" country compared to the lower-risk environment of China and Japan, because we rely on "a more volatile market incentive approach and has suffered from a start-stop approach in some areas."

What is demanded today is a national energy competitiveness project based on the success of past U.S. innovation policy, including targeted support for technology research, development, demonstration, deployment, education, infrastructure, and manufacturing. A large and growing group of energy experts, think tanks, and companies - including Google, Brookings Institution, dozens of Nobel Laureates, Association of American Universities, Breakthrough Institute, and Third Way - has united behind a target for federal clean energy R&D at \$15 billion per year. Unfortunately, the climate bill under consideration in the Senate would only invest around \$1.4 billion per year in energy R&D. Similarly, the bill would only offer a one-time capitalization of \$10 billion for a Clean Energy Deployment Administration. Another good provision is the IMPACT Act, focused on clean technology manufacturing, but here again it is unclear whether it will be adequately funded.

As we conclude in "Rising Tigers, Sleeping Giant": "If the United States hopes to compete for new clean energy industries it must close the widening gap between U.S. and Asian government investments in research and innovation, manufacturing, and domestic market demand. Small, indirect and uncoordinated incentives are not sufficient to outcompete Asia's clean tech tigers. To regain economic leadership in the global clean energy industry, U.S. energy policy must include large, direct and coordinated investments in clean technology R&D, manufacturing, deployment, and infrastructure."

The Energy Generation

The remaining piece is clean energy education. It is well known that America is falling behind in high-tech education. What's less well understood is that nearly half the U.S. energy workforce is expected to retire over the next decade. Federal investment in education, from the G.I. Bill to the National Defense Education Act, was vital for U.S. competitiveness in the post-war era, and it will be vital for competing in the burgeoning clean energy industry. As Nobel Laureate Paul Krugman recently put it, "If you had to explain America's economic success with one word, that word would be 'education.'"

In April, President Obama proposed an important initiative to inspire the next generation of clean energy innovators. The program, called RE-ENERGYSE (Regaining our Energy Science and Engineering Edge), would prepare thousands of highly skilled scientists and engineers to enter clean-energy fields by supporting energy education programs at universities, technical colleges, and K-12 schools. According to the Department of Energy, the program would educate between 5,000 and 8,500 energy scientists, engineers, and other professionals by 2015, rising to 10,000 to 17,000 professionals by 2020.

RE-ENERGYSE is critical for reclaiming U.S. leadership in the clean energy sector. As a group of over 100 universities, professional associations, and student groups stated in a recent letter to the Senate, "RE-ENERGYSE is an innovative program that will train America's future energy workforce, accelerate our transition to a prosperous clean energy economy, and ensure that we lead the world's burgeoning clean technology industries."

Unfortunately, Congress failed to provide any funding for RE-ENERGYSE for 2010. But the administration is not giving up, and it intends to pursue funding for RE-ENERGYSE in its 2011 budget proposal. College students have a unique role to play in advancing this initiative and the broader energy competitiveness agenda. RE-ENERGYSE needs a much stronger base of support to pass Congress next year, and as the primary stakeholders in the program, students can be uniquely influential in organizing a coalition of supporters and directly voicing their concerns to members of Congress. That's why students at Stanford University are currently launching a national effort called Americans for Energy Leadership, aimed at advancing RE-ENERGYSE and inspiring the next generation of energy innovators.

Fifty years ago, in the wake of the launch of Sputnik, the United States launched a massive national effort to

lead the space race and win the Cold War. Today, the clean energy race represents one of the greatest opportunities and challenges for American leadership in a generation. If we do not take immediate action to launch a national energy competitiveness project based on large, direct, and coordinated innovation policies, we will effectively cede the clean-energy industry to Asia and other competitors. The mass majority of exports, jobs, tax revenues, and other economic benefits will accrue to foreign countries, and we will miss a historic opportunity to achieve a new era of American leadership. The choice should be clear.

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By Teryn Norris & Devon Swezey

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Teryn Norris is a Senior Advisor at the Breakthrough Institute, Public Policy major at Stanford University, and Director of Americans for Energy Leadership. Devon Swezey is Project Director at the Breakthrough Institute and graduated from Stanford University in 2008. They are co-authors of the new report, "Rising Tigers, Sleeping Giant: Asian Nations Set to Dominate the Clean Energy Race by Out-Investing the United States."

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