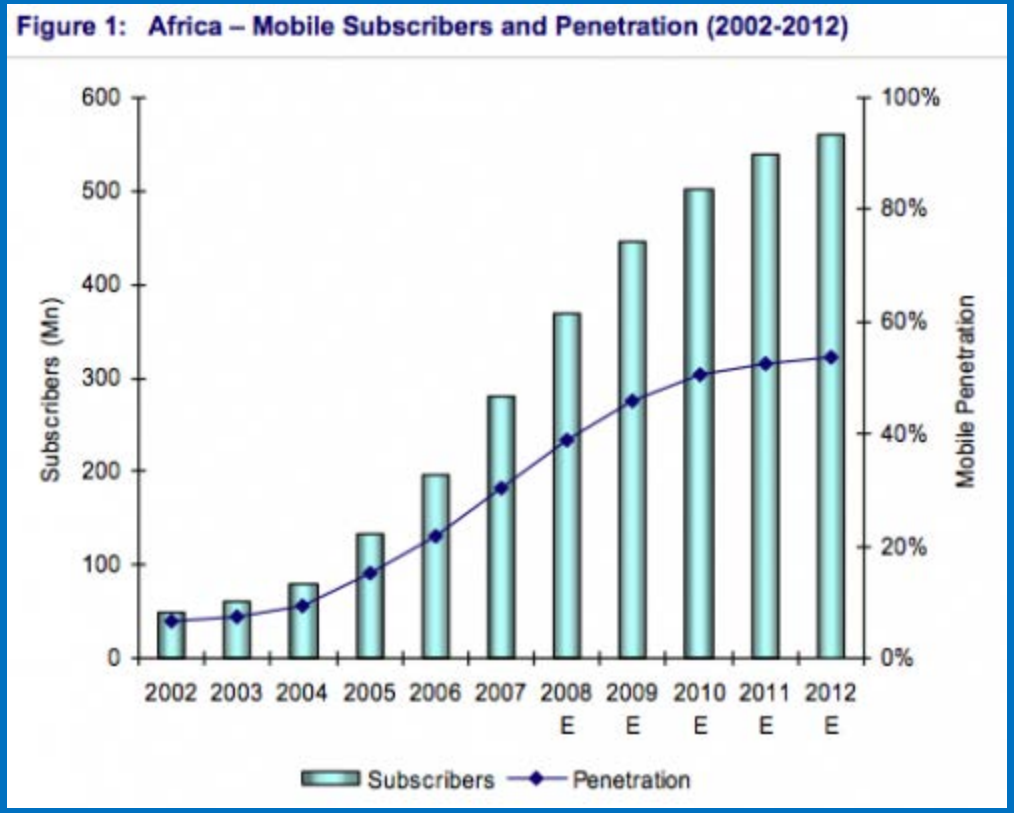
The Role of Science in Public Policy

Science diplomacy is a central component of America's twenty-first century statecraft agenda.

The United States must increasingly recognize the vital role science and technology can play in addressing major challenges, such as making our economy more competitive, tackling global health issues, and dealing with climate change. American leadership in global technological advances and scientific research, and the dynamism of our companies and universities in these areas, is a major source of our economic, foreign policy, and national security strength.

Innovation policy is part of our science diplomacy engagement.

More than ever before, modern economies are rooted in science and technology. It is estimated that America's knowledge-based industries represent 40 percent of our economic growth and 60 percent of our exports. Sustaining a vibrant knowledge-based economy, as well as a strong commitment to educational excellence and advanced research, provides an opportunity for our citizens to prosper and enjoy upward mobility.



"Innovation parks are taking a place next to factories, investment banks next to mobile phone banking kiosks, and internet startups next to mom-and-pop store fronts. As I touched down in Ethiopia for the World Economic Forum on Africa, I was struck by the thought: Africa is emerging."

Kris Balderston, U.S. State Dept., May 2012

Africa is on track to become the next big investment destination. The Economist indicates that six of the world's ten fastest-growing economies over the past decade were in sub-Saharan Africa. McKinsey & Company, Boston Consulting Group, and the Center for Global Development have all recently released their own reports or surveys supporting the case for Africa's emergence into the global economic landscape.

The Role of Science in Public Policy

The practice of science is increasingly expanding from individuals to groups, from single disciplines to interdisciplinary, and from a national to an international scope.

American researchers, innovators, and institutions, as well as their foreign counterparts, benefit through these international collaborations. Governments that restrict the flow of scientific expertise and data will find themselves isolated, cut off from the global networks that drive scientific and economic innovation.

The Role of Science in Public Policy

Throughout the second half of the twentieth century, science also played other important roles in diplomacy.

Today, U.S. science and technology (S&T) collaboration with China is one of America's largest cooperative programs, and productive relationships exist across multiple disciplines. While for many Americans today, China is seen more as a competitor than a partner in applying science to solve the broad challenges facing the world, the reality is that science cooperation has provided great benefits to both countries in areas ranging from climate change and environment to energy and food security, among others.

This new era of science diplomacy, which often involves non-governmental scientists and academics, has provided connections to important communities in countries that include Cuba, Burma, Iran, and North Korea, even in the absence of formal government-to-government relations and despite occasional political crises.

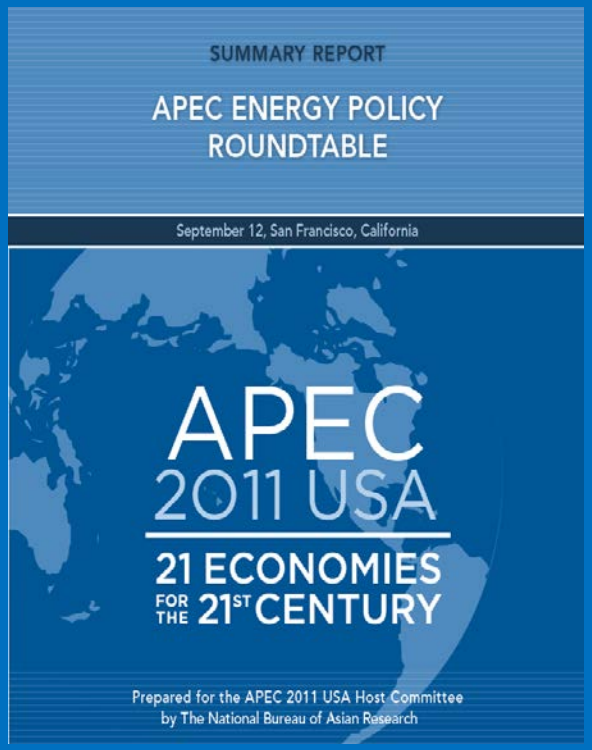
The Role of Science in Public Policy

While there are many successes in science diplomacy, the difficulties should not be underestimated.

Barriers such as visa restrictions, resource limitations, and sensitivities to issues being discussed can complicate the process. Abrupt political changes can seriously impact activities. For instance, promising opportunities with Syria have been sidelined by the present internal conflict wracking that country. Under such circumstances, patience and perseverance become essential elements of efforts to identify mutually beneficial and productive paths forward.

Big scientific endeavors, including international space research, global health programs, and massive experimental energy programs such as ITER, require close interaction between scientists and diplomats to agree on multinational cooperation in technical areas where sharing the costs, resources, or risks among many partners is preferred or even essential. Further there are areas central to foreign policymaking—such as climate change, security, pandemics, and protection of shared natural resources, including open oceans and fisheries—where diplomats have greatly benefited from the information, suggestions, and advice coming from scientists.

APEC – An Example of an International Group

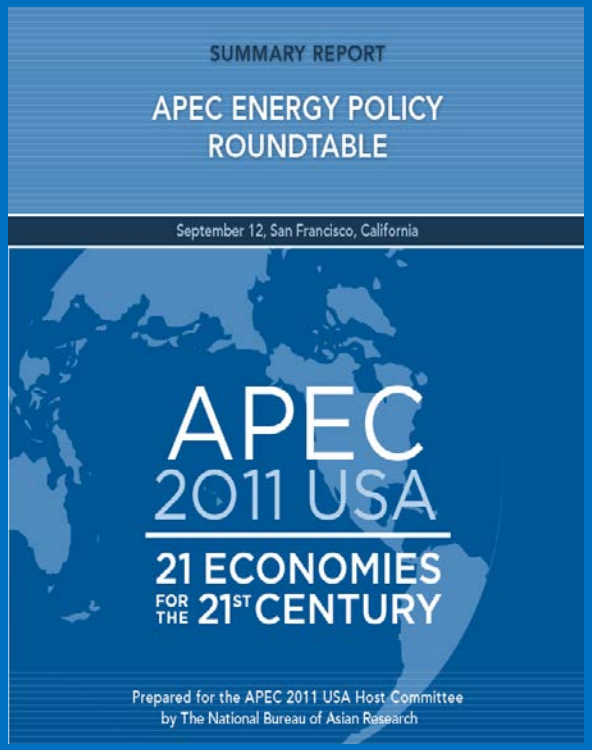


United States Under Secretary of State Robert Hormats sponsored the APEC Energy Policy Roundtable, held in San Francisco, California on September 12.

This meeting, organized by the APEC 2011 USA Host Committee and the National Center for APEC, brought together approximately one hundred key stakeholders from the APEC region's public and private sectors. Together, they sought to identify promising and practical solutions for the region's energy and economic challenges.

Policy mechanisms should support the development and deployment of new, viable technologies while not picking winners. As Bryan Hannegan, Vice President for Environment and Renewables, Electric Power Research Institute, noted, "By varying technologies, you can vary the energy mix."

APEC – An Example of an International Group

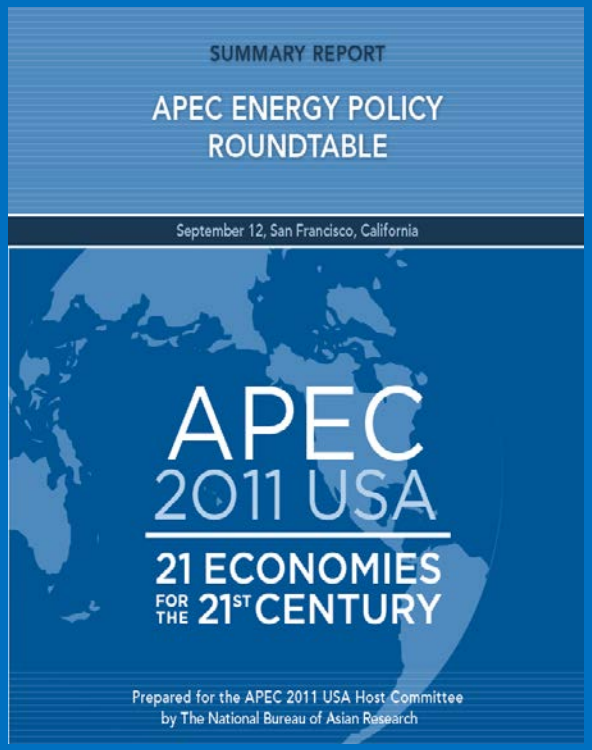


As Blair Comley, Secretary of the Australian Department of Climate Change and Energy Efficiency, stated, "Technology is key to decoupling economic growth from emissions growth."

Australia's per capita emissions in 2005 were the highest in the developed world, and the Australian government has committed to reducing carbon emissions by at least 5 percent from 2000 levels by 2020 irrespective of what other countries do and by up to 15 or 25 percent depending on the scale of global action.

By pricing carbon, encouraging innovation in clean energy, improving energy efficiency and creating opportunities on the land, the Australian government is pursuing a combination of policy and market solutions suited for Australia's own conditions to achieve its emissions reduction target.

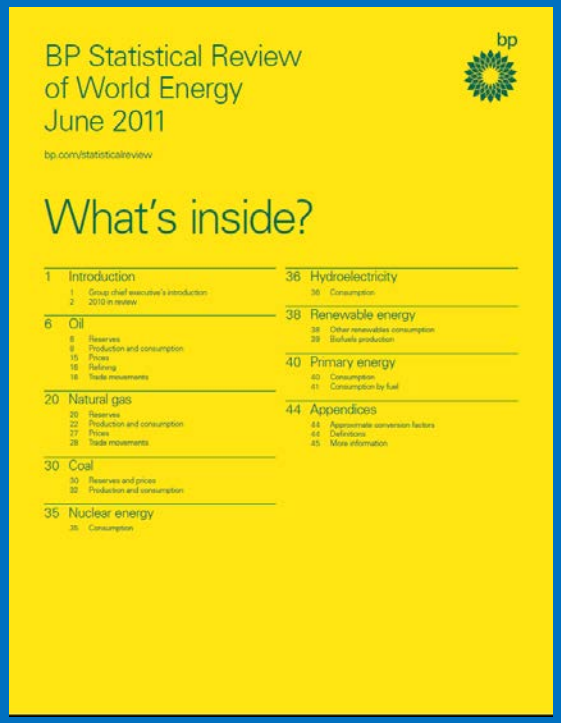
APEC – An Example of an International Group



Increasing demand-side efficiency through appropriate energy policies and regulations can slow the sharp rise in demand and help make energy more affordable. Therefore, by working together, governments and industry can pursue greater energy efficiency on both sides of the equation relatively easily.

"Efficiency is the best way toward energy security," Secretary Steven Chu, U.S. Department of Energy, concluded.

The Role of Research


BP Statistical Review of World Energy June 2011

bp.com/statisticalreview

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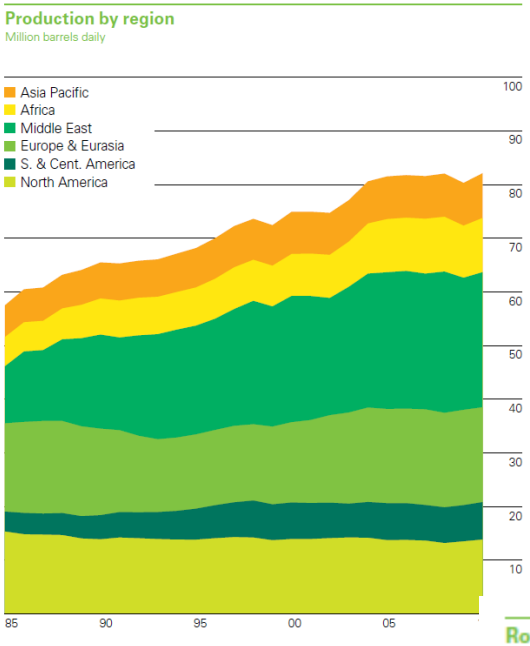
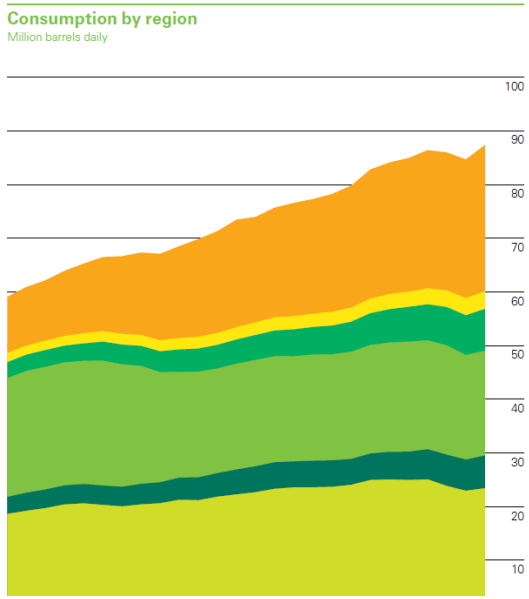
Global energy consumption in 2010 rebounded strongly, driven by economic recovery. The growth in energy consumption was broad-based, with mature OECD economies joining non-OECD countries in growing at above-average rates.

All forms of energy grew strongly, with growth in fossil fuels suggesting that global CO2 emissions from energy use grew at the fastest rate since 1969.

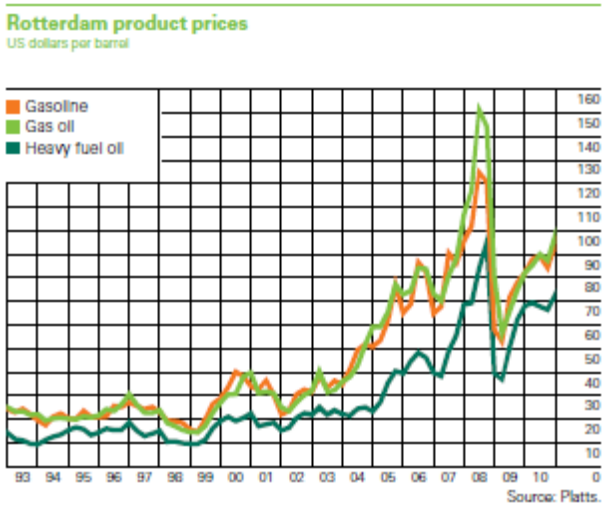
Natural gas prices grew strongly in the UK and in markets indexed to oil prices (including much of the world's LNG); but prices remained weak in North America – where shale gas production continued to increase – and in continental Europe (partly due to a growing share of spot-priced deliveries). Coal prices remained weak in Japan and North America, but rose strongly in Europe.

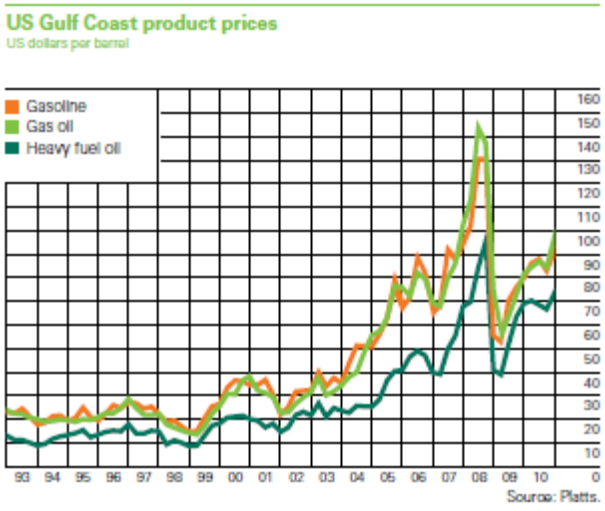
The Role of Research





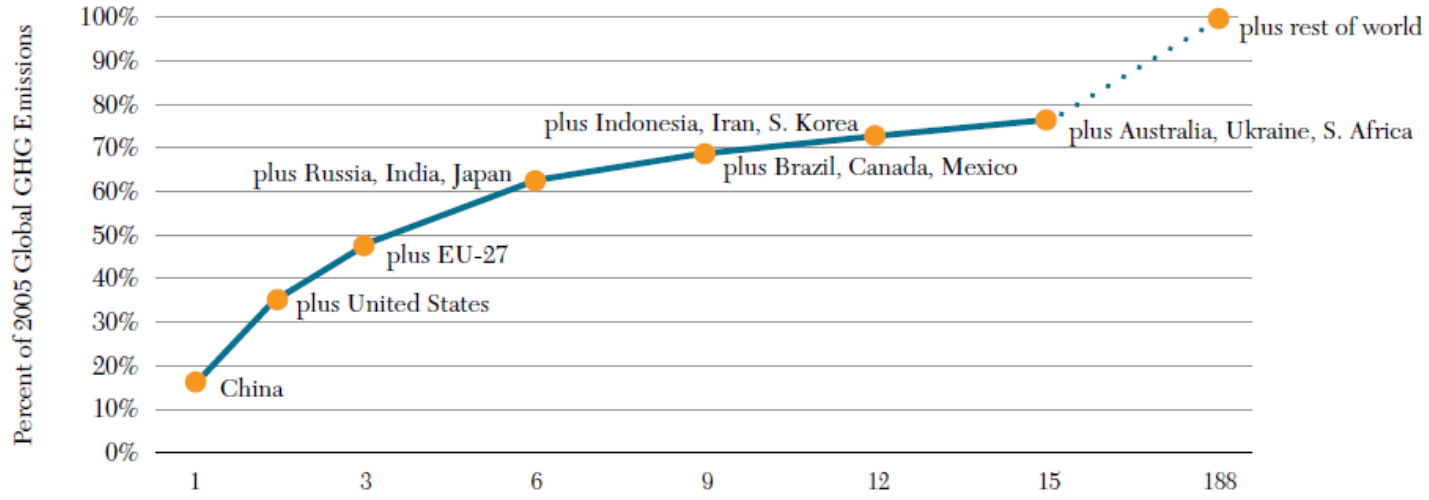
World oil production increased by 1.8 million b/d in 2010; growth was broadly-based, with
and non-OPEC countries. World oil consumption increased by 2.7 million b/d; growth was
consumption growth.





The New Energy Climate Challenge

Figure 10 **Aggregate GHG Emissions by Country, 2005**



Source: WRI, CAIT. Percent contributions are for year 2005 GHG emissions only. Moving from left to right, countries are added in order of their absolute emissions, with the largest being added first. Figures exclude emissions from land-use change and forestry and bunker fuels. Adapted from Figure 2.3 in Baumert et al. (2005)

The New Energy Climate Challenge


WRI POLICY BRIEF

WORLD RESOURCES INSTITUTE

CHINA, THE UNITED STATES, AND THE CLIMATE CHANGE CHALLENGE

DEBORAH SELIGSOHN, ROBERT HEILMAYR, XIAOMEI TAN, LUTZ WEISCHER

As the two largest current global emitters of greenhouse gases (GHGs), it is imperative that the United States and China work together to support effective domestic energy and climate change programs and an effective international climate regime.

As China's domestic energy policy has transformed over the last several years to incorporate climate-friendly goals – increased energy efficiency and a greater contribution of non-fossil fuels to its energy mix – this opportunity is already becoming a reality, especially as the United States advances comprehensive climate policy.

The New Energy Climate Challenge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China's Energy and Climate Policy

China's energy and climate change policy is based on its own assessment of national interest as outlined both in its 2007 National Climate Change Program and 2008 Climate Change White Paper. China's climate policy meshes with concerns about energy security, pollution abatement and the cost of energy itself, as well as the impacts of climate change and China's international reputation.

The New Energy Climate Challenge


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China's Energy and Climate Policy

China's approach is diverse and includes targets and quotas, industrial and equipment standards, energy taxes and financial incentives and penalties.

While China has gained some experience with carbon markets through the Clean Development Mechanism (an offset mechanism under the Kyoto Protocol), given China's institutional strength, as demonstrated by other policies, the country will likely use a variety of tools to continue to implement its climate change policy.

The New Energy Climate Challenge


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U.S.-China Competitiveness Concerns and Cooperation Opportunities

This brief addresses the concern in the United States about potential transfer of carbon-intensive jobs to China. While a carbon cost will not be a major factor in most sectors in the United States, some sectors could be affected.

This concern can be addressed through adjustments to the United States' domestic allowance system under cap-and-trade legislation, by coordinated action under an international agreement, or by trade measures. Trade measures are unlikely to be an attractive option as they increase costs for downstream users, threaten export markets and potentially damage international negotiations.

The New Energy Climate Challenge


WRI POLICY BRIEF

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A clear program for collaboration between the United States and China should:

Set clear goals and benchmarks, both in energy or carbon terms and in terms of programs, projects, technologies and policies to be developed;

Be tied to a specific funding mechanism in the United States;

Involve relatively modest but long-term programs in areas including monitoring, regulatory infrastructure, policy development and start-up research support;

Involve focused, ambitious programs in technology development and deployment.

Low Hanging Fruit – Energy Efficiency and Energy Intensity

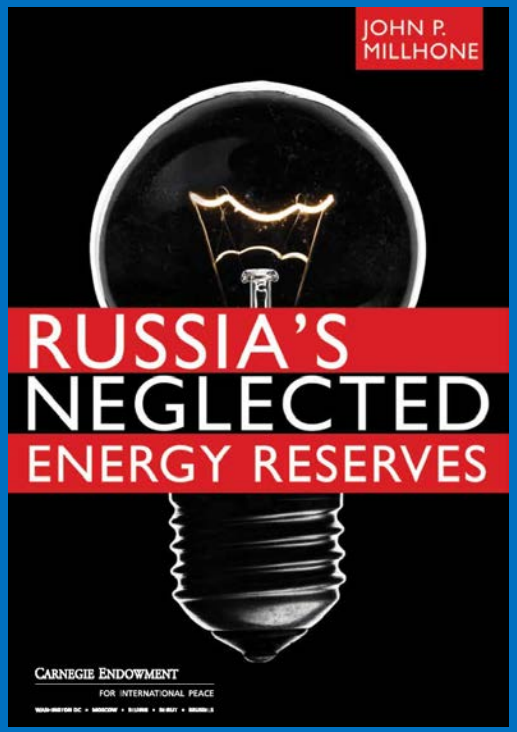
Improved energy efficiency is one of the fastest, the most environmentally sound and cost-effective ways to address energy security, economic growth, and climate change. More energy-efficient transport, industry, buildings and power grids , combined in more energy - efficient communities, can reduce both the direct use of fossil fuels and the demand for electricity which continues to be generated in large quantities from natural gas and coal.

More efficient management of gas, oil and coal production and use can also reduce emissions of methane, a clean energy resource yet a potent short-lived greenhouse gas. Therefore, measures to improve energy efficiency can cut the APEC region's dependence on oil and gas as well as reduce greenhouse gas emissions from fossil fuels. In this context, we commend progress on the Energy Smart Communities Initiative with its pillars of smart transport, buildings, power grids and jobs and education to share best practices that economies can use to improve energy efficiency. We also underline the successful progress of the APEC Low-Carbon Model Town (LCMT) Project.

Low Hanging Fruit – Energy Efficiency and Energy Intensity

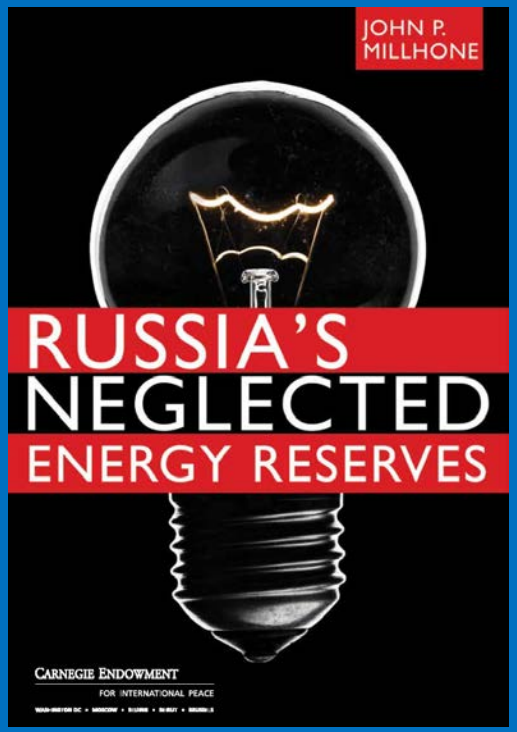
We reaffirm our commitment to the Green Growth goals set by APEC Leaders in Honolulu, United States in 2011. To address the economic and ecological challenges facing the APEC region we will promote a lower-carbon economy that strengthens energy security and generates new sources of economic growth, and helps achieve **the aspirational goal to reduce aggregate energy intensity of APEC economies by 45 percent from 2005 levels by 2035.** We also reaffirm the commitment of APEC Leaders to **rationalize and phase out inefficient fossil-fuel subsidies that encourage wasteful consumption, while recognizing the importance of providing those in need with essential energy services** and look forward to voluntary reports from economies on their efforts in this direction. We note that as we continue efforts to expand energy access for poor and rural populations, the reduction of subsidies will encourage more energy efficient consumption, leading to a positive impact on international energy prices and energy security, and will make renewable energy and technologies more competitive.

Low Hanging Fruit – Energy Efficiency and Energy Intensity



Russia has the world's largest share of fossil energy resources. During the Soviet era, because this wealth of resources insulated the country from global energy crises, citizens never had to worry about conserving energy, and much was squandered. Since the collapse of the Soviet Union, the situation has improved in western, urban Russia, but great expanses of this vast country continue their inefficient ways. Indeed, recognizing that minimizing waste helps preserve Russia's resources, Russian President Dmitry Medvedev successfully urged the Duma to pass sweeping new energy-efficiency legislation. But more remains to be done to identify how energy resources are used and wasted, and where efficiency might be improved.

Low Hanging Fruit – Energy Efficiency and Energy Intensity



1. Modernizing an aging electric power system with new and upgraded power plants and major reductions in transmission and distribution losses.

2. Upgrading and replacing the nearly 17,000 Soviet-era district heating systems.

3. Reducing the energy intensity of Russia's industry, which is far higher than in competing countries.

4. Retrofitting a porous housing and building stock and introducing an energy-efficiency building code.

5. Applying the brakes to a runaway acceleration in the energy used in transportation through efficiency standards for vehicles and improved mass transit.