
Climate Change and Role of Energy Efficiency

SAMUEL CHARAP AND GEORGI V. SAFONOV

In prepared remarks before a meeting with several ministers and senior aides on February 18, 2010, President Dmitri Medvedev delivered a highly unusual speech on climate change for a senior Russian official.¹ Just two months earlier, the Copenhagen climate talks had produced a document far less ambitious than had been hoped, and many observers had consigned the subject of climate change to the back-burner of international politics. It seemed Russia would have done the same, since its leadership's attitude toward global warming had ranged from denying its existence to seeing it purely as a means of augmenting Russia's role in international affairs.

Yet Medvedev, in contrast to both his previous statements on the topic and those of his predecessor and the current prime minister, Vladimir Putin, outlined an approach to Russian climate change policy that sounded strikingly similar to those of Western European countries:

[The disappointing outcome at Copenhagen] is not a reason to sit back now and do nothing, because we are responsible for the state of our planet.... We need to decide today how to make the most effective use of what has been achieved... and outline the best ways for aiding less developed countries to fight climate threats. The new climate agreement represents a real chance for mass introduction [of] energy-efficient and low-emission technology.... We are going to improve our energy efficiency and reduce our emissions regardless of whether or not there is an international agreement. This is in our own interest from both an economic and environmental point of view.

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1. Opening remarks at Meeting on Climate Change, February 18, 2010, <http://eng.kremlin.ru> (accessed on February 20, 2010).

Medvedev went on to urge the assembled officials to create incentives for the private sector to play a role in addressing climate change and called for adapting the government's climate doctrine, a framework for policy that he signed in late 2009, to current developments, making it a "living document" and not a "sacred cow." A month later, he repeated these ideas in a speech to the Security Council, a body consisting of Russia's most influential decision makers.²

In short, Medvedev asserted that climate change is real, that global warming threatens Russia's future, that Russia has a responsibility to address it both domestically and in international forums, that doing so can be economically beneficial, and that old policymaking patterns—a regulation-first approach to the economy and paper-tiger framework documents that become irrelevant soon after they are released—need to change if any progress is to be made. The speech is striking both because it is essentially the first time a Russian leader has made this argument coherently and because it is totally divorced from the reality of Russia's current approach to climate change, which can be charitably characterized as lackluster. Indeed, Medvedev has become known for making grand, forward-looking speeches, most of which seem fanciful and generally produce little substantive change.

This chapter demonstrates that scientific and economic data in fact support Medvedev's assertions. However, it also shows that Russia has either failed to live up to his stated goals or only begun the process of realizing them. Despite Medvedev's call to action, Russia has not been a leader on climate issues; in fact, it has either taken a passive stance or used the issue as leverage on other questions in global talks and failed to implement a serious domestic mitigation or adaptation program. The second half of the chapter focuses on energy efficiency. It demonstrates that the Russian government stands to reap huge benefits from increasing the efficiency of its economy and that this step in itself will lead to significant reductions in greenhouse gas emissions. Under Medvedev's leadership, some steps have been taken in this direction, but much remains to be done. Greater efficiency will not realize the full potential of emissions reduction in Russia, but it represents a crucial element in achieving this goal. The chapter concludes with proposals for the United States to engage Russia on energy efficiency. Such engagement would benefit both sides and would help add substance to the bilateral relationship on economic issues. But for international cooperation on these issues to gain traction, Russia needs to take a proactive stance on addressing climate change, a stance that is clearly economically beneficial given the emissions reductions that can be achieved by increasing efficiency. Medvedev's lofty words must be matched by concrete changes in policy.

2. Opening remarks at Security Council Meeting on Climate Change, March 17, 2010, <http://eng.kremlin.ru>.

Russia and Climate Change

Russia has been and continues to be responsible for a large share of cumulative anthropogenic carbon emissions into the atmosphere. Today, Russia is the third largest emitter of carbon dioxide (CO₂), behind only the United States and China (figure 6.1). Perhaps more importantly, before the economic crisis hit, Russia's per capita emissions were growing and were projected to approach the US level by 2030. Russia's third rank is all the more striking given that its emissions dropped by 40 percent in 1990–98 following the dramatic decline in energy consumption and industrial production precipitated by the economic contraction of the early post-Soviet period. As late as 2007, emissions have remained at only 66 percent of 1990 levels (figure 6.2).³

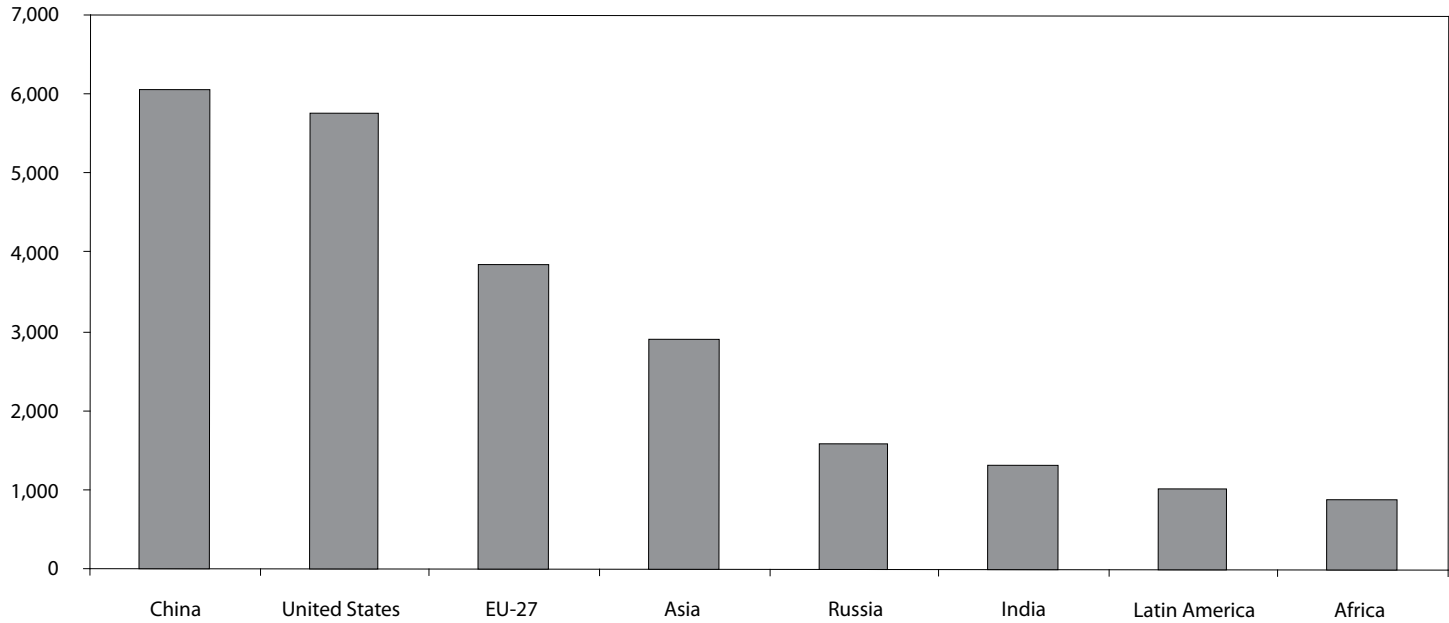
Russia is not only a major contributor to global warming; it is also especially vulnerable to its effects. Temperatures in Russia are rising faster than the world average. In 2008 the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Rosgidromet) issued an extensive report that demonstrated that winter temperatures increased by 2 to 3 degrees Celsius in Siberia over the past 120 to 150 years, while the average global temperature rose in that period by only 0.7 degrees.⁴ Rosgidromet's calculations demonstrate that Russia will experience global warming to a significantly greater extent than most other countries.

Despite the belief, widely held across its society, that, given its cold temperatures, Russia could benefit from global warming, climate change is, according to the World Bank, a "major threat to Russia" and will have significant negative effects—economic and social—there, not to mention the potentially devastating impacts on its ecosystem.⁵ Already Russia is experiencing more floods, windstorms, heat waves, forest fires, and melting of permafrost. In Yakutsk, collapsing ground caused by permafrost melt has damaged the structural integrity of several large apartment buildings, a power station, and a runway at the local airport. The total number of structures damaged as a result of uneven foundation subsidence increased by 61 percent there in the 1990s compared with the previ-

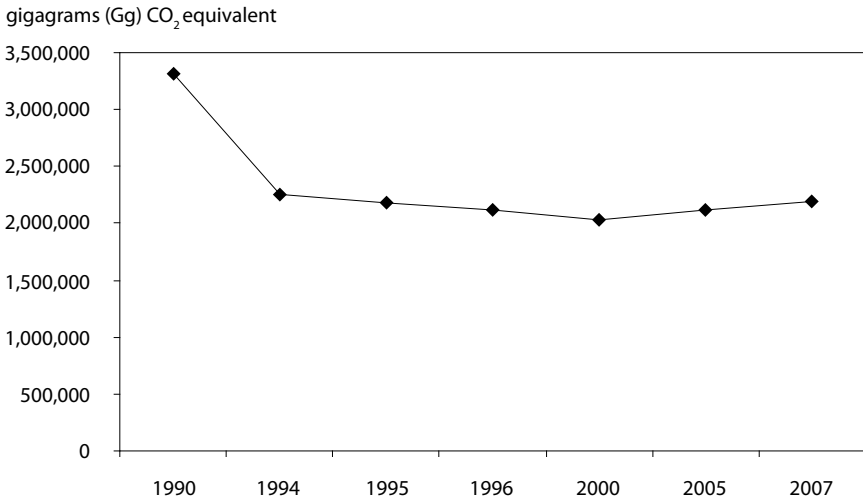
3. According to recent estimates, the global economic crisis led to a 7 to 8 percent decline in Russia's emissions, so in 2009 CO₂ levels could be the lowest in two decades.

4. For the English language summary of the report, see Federal Service for Hydrometeorology and Environmental Monitoring, *Assessment Report on Climate Change and Its Consequences in the Russian Federation: General Summary*, 2008, <http://climate2008.igce.ru> (accessed on January 31, 2010). The full version in Russian is also available at the same website.

5. See World Bank, *Adapting to Climate Change in Europe and Central Asia* (Washington, June 2009), www.worldbank.org (accessed on January 31, 2010) and "Russia Needs to Act Swiftly to Reduce Vulnerability to Its Changing Climate," in *Russian Economic Report 19* (Washington: World Bank, June 2009), www.worldbank.org (accessed on January 31, 2010), 22–28.

Figure 6.1 Energy-related carbon dioxide (CO₂) emissions by selected countries and regions, 2007million tons of CO₂ per year

Source: United Nations Framework Convention on Climate Change (UNFCCC), National Greenhouse Gas Inventory Data for the Period 1990–2007, October 21, 2009, <http://unfccc.int>.

Figure 6.2 Russia's greenhouse gas emissions, 1990–2007

Source: Generated from the UNFCCC Data Interface, <http://unfccc.int>, December 2009.

ous decade.⁶ Extreme events, snowmelt, and warmer temperatures have precipitated significant tree loss and degradation. And such phenomena are only going to become more common with rising temperatures. Areas of discontinuous permafrost (which covers over 60 percent of Russia's territory) are particularly at risk; melting will have social⁷ and economic effects because of the large amount of oil and gas infrastructure in these areas—93 percent of natural gas and 75 percent of oil production occurs in permafrost zones. Indeed, climate change poses a direct threat to the energy sector, which plays a crucial role in the economy. Most of the extraction and other structures were built on pile foundations using permafrost soils as a base, and therefore their stability is dependent on that permafrost not melting. Already over 7,400 accidents related to melting of permafrost and soil degradation in West Siberia were reported in 2007, while up to \$1.8 billion is spent annually on accidents and upkeep of pipelines.⁸

6. World Wildlife Foundation Russia, *Climate Change Impacts in the Russian Arctic: Searching for Ways for Adaptation*, 2009, www.wwf.ru (accessed on March 3, 2010).

7. Communities will have to be resettled since up to a quarter of housing stock in the far north will be destroyed by 2030. This figure was cited by First Deputy Minister of Emergency Situations Ruslan Tsalikov. See "Global'noe poteplenie unichtozhit Sever Rossii" ["Global Warming Will Destroy Russia's North"], February 11, 2009, www.indigenousportal.com/Climate-Change (accessed on March 2, 2010).

8. Oleg Anisimov, ed., *Osnovnye prirodnye i sotsial'no-ekonomicheskie posledstviia izmeneniia klimata v raionakh rasprostraneniia mnogoletnemerzlykh porod: prognoz na osnove sinteza nabliudenii*

Overall, according to Minister of Natural Resources Yuri Trutnev, climate change could cause up to 5 percent reduction in GDP, while the cost of dealing with extreme weather events will amount to around \$2 billion annually.⁹ Public health could also suffer, since permafrost melt poses a risk to the integrity of the water supply and sewer engineering systems. Permafrost weakening on Novaya Zemlya, where several radioactive waste storage sites are located, could have particularly dire consequences.¹⁰

Global warming could entail some potential upsides for Russia. In the energy sector, offshore production and transport will likely benefit due to reductions in sea ice, which will lengthen the navigation season in the Arctic, although it is unclear whether these benefits will outweigh the costs to the sector from permafrost melt. Some claim that warmer temperatures will also benefit Russian agriculture. However, studies based on highly detailed models suggest that global warming will have a net zero effect on the sector.¹¹ Moreover, Russian agriculture is highly inefficient and suffers from low productivity, making it unlikely to be able to take advantage of any potential gains.¹²

Russia's Role in International Climate Policy

Despite both Russia's central role in causing, and thus potentially abating, global warming and its vulnerability to rising temperatures, Moscow has often assumed a passive role in the construction of the international climate regime and scrupulously avoided commitments that would force it to take steps to reduce emissions. Its major contribution—ratification of the Kyoto Protocol when its signature was needed for the treaty to take effect—was driven largely by political factors and has required no meaningful changes in its policies.

Russia has also “contributed” to international efforts to control emissions through the wrenching economic contraction, and resulting drop in emissions, it experienced in the 1990s. For example, were it not for Russia's drop in emissions in that period, the quantitative target of reducing

i modelirovaniia [The Main Environmental and Socio-Economic Consequences of Climate Change in Regions with Widespread Permafrost: A Prognosis Based on a Synthesis of Observation and Modeling] (evaluation report, Greenpeace Russia, November 2009), www.greenpeace.org (accessed on March 3, 2010).

9. Yuri Trutnev, presentation at a Meeting of the Presidium of the Government, April 24, 2009, www.priroda.ru (accessed on January 31, 2010).

10. World Wildlife Foundation Russia, *Climate Change Impacts in the Russian Arctic*, 47, 51.

11. William R. Cline, *Global Warming and Agriculture: Impact Estimates by Country* (Washington: Peterson Institute for International Economics, 2007), 59.

12. World Bank, *Russian Economic Report* 19, 26.

the emissions of Annex I Parties¹³ to the UN Framework Convention on Climate Change (UNFCCC), which Russia ratified in 1995, to 1990 levels by 2000 would have been impossible.

The Kyoto Protocol to the UNFCCC, which was initially adopted in December 1997 but entered into force only in February 2005 after Moscow ratified it, provides legally binding commitments for developed countries and some transition economies, including Russia, to modulate emissions to an agreed-upon level by 2012 relative to the baseline of their 1990 emissions. Russia only agreed not to exceed 1990 levels, rather than reducing its emissions below that baseline. As a result of the post-Soviet emissions drop, without any additional efforts Russian emissions will not return to 1990 levels before at least 2020. In December 2009, Russia was 40 percent below the baseline.

Therefore, Moscow's participation in Kyoto required it to make no additional efforts to meet its obligations. Further, Russia stood to gain billions of dollars through the various flexibility mechanisms, such as trading of carbon credits, outlined in the Protocol. Nonetheless, Russia withheld its approval for seven years.

The Protocol could not have come into force unless at least 55 countries representing at least 55 percent of global carbon emissions ratified it. When the first round of commitments was announced, enough countries were willing to ratify the treaty but their emissions did not add up to the share of global carbon output required for enactment. Once the United States declared that it would not join, Russia's participation was necessary to meet that goal. In other words, because of its contribution to global warming as the third largest emitter, Russia's eventual decision to participate in Kyoto proved crucial in bringing the treaty into force.

While Russia's decision to ratify the Protocol is often cited as a demonstration of its productive role in contributing to international efforts to control global warming, Moscow's motives were far less altruistic. Indeed, it is widely believed that then president Putin agreed to sign the Kyoto Protocol in return for the European Union's granting of certain concessions in its negotiations with Russia on its bilateral World Trade Organization (WTO) accession protocol—in effect giving its blessing to Russia's membership.

Since 2008 the international community has been negotiating a follow-on agreement to the Kyoto Protocol that should provide a longer-term framework for international efforts to combat climate change. Russia's behavior in this period made it clear that its participation in Kyoto had not transformed it into a leader in the international effort to address climate change. In its submission to the UNFCCC prior to the Poznan Conference

13. Annex I countries include developed economies and some emerging economies such as Russia, Ukraine, and Belarus. These countries have special obligations under the convention.

of Parties (COP) in December 2008, Russia declared the goal of a 25 to 40 percent reduction from 1990 levels by 2020 “unreasonable” and asserted that legally binding commitments must be interpreted as “non-enforceable, non-punitive as well as flexible.”

In June 2009, President Medvedev announced Russia’s post-Kyoto proposed target as 10 to 15 percent below the 1990 baseline. It would be a stretch to call this ambitious: It translates to an effective 30 to 35 percent emissions *increase* from the 2007 level and implies an *acceleration* in annual emissions growth. Although Medvedev upped his pledge in December 2009 to a 20 to 25 percent drop, this still is not as ambitious as it could be; independent studies have shown that at least a 30 percent reduction is possible.¹⁴ His own goal of a 40 percent decline in energy intensity (energy expended per unit of GDP) by 2020 would necessitate a greater decrease in emissions below the 1990 baseline than he seems willing to commit to in the context of the climate talks.¹⁵

Its track record at recent multilateral meetings demonstrates that Russia has largely been a passive player in international climate policy. At meetings of the parties to the UNFCCC and other climate-related gatherings such as the Major Economies Forum (MEF), Russia is notable for its silence; its negotiators are not active participants, let alone leaders, in the talks and take little initiative. Its attitude was neatly summed up by one of the government’s lead climate experts: “The solution to climate change negotiations lies between the US and China.”¹⁶ In other words, Russia is content to sit on the sidelines until the other players come to an agreement and then decide whether to participate.

On the one hand, this may be a deliberate strategy: While the other major emitters debate and look for compromise, Russia has complete freedom of maneuver. It can agree on a strict emissions reduction target or disagree with it; agree on financing adaptation needs of least developed countries or object to it; or accept flexibility mechanisms or continue avoiding their use. On the other hand, pure bureaucratic and political factors might be at play: Without a strong signal from the political leadership that an ambitious treaty is a priority, working-level officials will be highly unlikely to take the initiative on their own. As the Russian saying goes, initiative is punishable.

Russia’s behavior at the 15th COP, or COP-15, which was held in December 2009 in Copenhagen, represented a slight, but nonetheless important, departure from this trend. The goal of the Copenhagen meeting was to reach a legally binding agreement on further greenhouse gas emissions

14. Oldag Caspar, “Russia in the UN Climate Talks” (unpublished manuscript, Helsinki: Finnish Institute of International Affairs, June 2009).

15. Georgi Safonov’s calculations.

16. Samuel Charap and Georgi Safonov’s interview with Sergei Tulinov, advisor to the director of Rosgidromet, October 2009.

cuts, create an arrangement to finance adaptation and mitigation in developing countries, and delineate mechanisms for international cooperation in emissions reductions, among other issues. Given its contribution to global warming and status as a Kyoto signatory, Russia's position at the COP-15 was important. Further, if it were to have demanded to be compensated for the massive amount of carbon credits it had accumulated under Kyoto, Moscow could have torpedoed an agreement or at least made a functioning carbon market impossible.¹⁷

What changed at Copenhagen was the Russian leadership's engagement with the issue. Medvedev not only attended but also created an entry in his video blog on the subject¹⁸ and made a major speech at the conference. In his address, he said that "Russia is ready to play the most active part in all of this processes [sic]. We recognize our share of the responsibility and this is the guideline in our efforts."¹⁹ Such rhetoric represents a departure from his predecessor; indeed, it is hard to imagine the current prime minister giving such a speech.

Russia did end up signing the so-called Copenhagen Accord at the COP-15, but, as per the pattern described earlier, it played no significant role in formulating it. There was one breakthrough at Copenhagen: Russia agreed to provide funding for the Copenhagen Green Climate Fund, which will finance adaptation and mitigation activities in least developed countries. Russia had previously refused to participate in any such assistance projects.

On February 1, 2010, Russia submitted its plans for reducing greenhouse gas emissions as the Copenhagen Accord requires.²⁰ Strangely, its submission appears to have been a step backward: Russia committed to a 15 to 25 percent reduction from the 1990 baseline, as opposed to the 20 to 25 percent that Medvedev had proclaimed less than two months earlier. The commitment was conditioned on the participation of all major emitters in a legally binding agreement and on Russia's forest sinks being taken into account in calculations of its overall emissions. This latter demand has become a top priority for Russian international climate policy. On average, Russian forests absorb about 300 million tons of CO₂ per annum. However, Russia supports allowing countries not to account for emissions from

17. See Anna Korppoo and Thomas Spencer, "The Dead Souls: How to Deal with the Russian Surplus?" Briefing Paper 39 (Helsinki: Finnish Institute of International Affairs, September 4, 2009).

18. See recording on Dmitri Medvedev's blog: World's Major Greenhouse Gas Emitters Must Simultaneously Make the Necessary Commitments, December 14, 2009, <http://eng.kremlin.ru> (accessed on January 31, 2010).

19. Speech at Climate Change Conference Plenary Session in Copenhagen, December 18, 2009, <http://eng.kremlin.ru> (accessed on January 31, 2010).

20. See UNFCCC, Quantified Economy-Wide Emissions Targets for 2020 for Annex I Parties, <http://unfccc.int> (accessed on February 1, 2010).

forest management until this sector becomes a net source of emissions and favors accounting approaches that would allow for “hiding” of expected increased emissions from growth in the forestry sector.²¹ In other words, commercial motives seem to be at work in addition to other factors.

Despite the increased engagement in Copenhagen, Russia’s relatively unambitious submission shows that it largely remains a passive actor on climate issues. Further, it underscores that Russia’s climate policy continues to be based on the view that the drop in emissions that resulted from the post-Soviet economic contraction represents a “contribution” to global efforts to control climate change. The wrenching social impact of economic contraction, and thus the “contribution,” is considered a “sacrifice” made by the Russian people in the fight against global warming.²² As a result, Russian policymakers consider that their country is entitled to avoid an affirmative stance on emissions reductions, which they consider a threat to economic growth.

Climate Policy at Home

Russia does not have a discrete climate change policy, but instead the government considers policies and measures in the energy sector, industry, municipal heat supply, forestry, and other areas as having side benefits in terms of greenhouse gas emission reduction or sinks. The secondary impacts of other policies and measures are as close as Russia gets to a “climate policy.”

That said, on the eve of his departure for Copenhagen in December 2009, President Medvedev took a major step forward in climate policy and signed the Russian climate doctrine²³ (box 6.1). The doctrine marks the first attempt at institutionalizing climate change policy. Among other steps, it acknowledges the harmful effects of climate change, states the need to take into account climate-related consequences in economic, social and other policies, and outlines measures for adaptation—which could address the potential damage from permafrost melting, infrastructure collapse, South-to-North spread of infectious diseases—and mitigation.

However, the doctrine is an inadequate framework for policymaking. It does not establish concrete goals for mitigation and adaptation, mechanisms for such activities, or a framework for international cooperation.

21. See Anna Korppoo and Thomas Spencer, “The Layers of the Doll: Exploring the Russian Position for Copenhagen,” Briefing Paper 46 (Helsinki: Finnish Institute of International Affairs, November 5, 2009), 6–7.

22. Samuel Charap’s interview with Arkady Dvorkovich, economic advisor to the president of Russia, October 2009.

23. Climate Doctrine of the Russian Federation, <http://eng.kremlin.ru> (accessed on January 31, 2010).

Box 6.1 Russia's climate doctrine

The climate doctrine offers goals, principles, and means to unify government policy on climate change. According to the doctrine, "the strategic goal of climate policy is to achieve secure and sustainable development of the Russian Federation, including institutional, economic, environmental, and social as well as demographic aspects of development in the context of changing climate and emerging challenges..."

The main tasks of climate policy are formulated in the doctrine as follows:

- establishment of legal and regulatory frameworks and government regulations in the area of climate change;
- development of economic mechanisms related to the implementation of measures aimed to adapt to and mitigate human impact on climate;
- scientific, information, and personnel support for the development and implementation of measures aimed at adapting to and mitigating human impact on climate; and
- international cooperation in the development and implementation of measures aimed at adapting to and mitigating human impact on climate.

Further, the document places much more emphasis on adaptation than mitigation. One observer called the doctrine a "call to take cover."²⁴ The doctrine is to a significant degree window dressing, creating the appearance that the Russian government really cares about climate change while not outlining a program that would amount to a serious attempt to address it. That said, at the meeting of the Security Council in March 2010 mentioned earlier, Medvedev issued a presidential instruction to the government to "approve a package of measures for implementing" the doctrine by October 1, 2010, including "drafting the necessary laws and regulations."²⁵ Time will tell whether Putin's government takes his request seriously.

Politics of Climate Change Policy

As this review demonstrates, climate policy has not been a major priority for the Russian government. Russia has shown no inclination to lead in international climate talks nor has it taken major steps in the domestic context to mitigate climate change or address its impact. This stance could

24. Kristin Jørgensen of the Bellona Foundation in the *Moscow Times*, May 14, 2009.

25. Opening Remarks at Security Council Meeting on Climate Change, March 17, 2010, eng.kremlin.ru.

be the result of the elite's continuing skepticism about the anthropogenic nature of climate change and the negative impact global warming will have on Russia. In 2003, then president Putin famously quipped, "For a northern country like Russia, it won't be that bad if it gets two or three degrees warmer," since "we would spend less on fur coats" and "our grain production would increase."²⁶ More recent statements, such as Federation Council Speaker Sergei Mironov's comment that the "impact of greenhouse-gas emissions on the climate has not been studied sufficiently," and therefore the Kyoto Protocol has little meaning, indicate that similar views persist, even if the top leadership has changed its tune. (Mironov also claimed that a process of global cooling was taking place, and cited the paintings of the Dutch Masters, which featured bright landscapes, as evidence.)²⁷

Climate skepticism is in fact rife throughout Russian society, even in certain quarters of the scientific community. Indeed, in the weeks leading up to the COP-15, and while it was taking place, these skeptics were particularly vocal. In early November 2009, Russia's state-owned Channel 1 aired a documentary called "The History of Deception: Global Warming," which purported to demonstrate that the link between human activity and climate change was fabricated by a media conspiracy. The bulk of the mid-December issue of the respected *Kommersant-Vlast'* political magazine was devoted to climate skepticism, with one article alleging that efforts to address climate change are in fact a cover for funneling money to a cottage industry of scientists, green-tech firms, and corrupt developing countries. The week before the COP-15, the Russian Academy of Sciences Institute of Oceanography issued a report claiming that human activity is not a major factor in climate change, while the director of the research institute of the Ministry of Energy attributed global warming to the slowing of the Earth's rotation.

Perhaps as a result of this drumbeat of pseudoscience, only 40 percent of Russians consider climate change a serious issue, as opposed to 70 percent of Turks.²⁸ There is also a chronic ignorance of environmental problems in the country. The lack of public pressure and the dominance of climate change skepticism have attached no political costs to keeping climate change a low priority issue for the Kremlin.

26. Quoted in Maria Antonova, "World Bank Warns on Climate Change," *Moscow Times*, October 29, 2009.

27. Simon Shuster, "Mironov Tells Kyoto Experts the World Is Getting Cooler," *Moscow Times*, May 28, 2007; Simon Shuster, "Russia Still Dragging Its Feet on Climate Change," November 4, 2009, TIME Special on COP-15: Climate-Change Conference, www.time.com/time/specials (accessed on April 16, 2010).

28. World Bank, *Russian Economic Report* 19, 23.

Energy Efficiency and the Economic Benefits of an Affirmative Climate Policy

As the previous section demonstrates, Russia has not adopted the affirmative approach to climate policy that Medvedev advocated in his February and March 2010 speeches. The unambitious approach to emissions reductions appears to be a function of the perception that taking action will limit Russia's potential to develop its economy. This line of thinking fails to appreciate the role energy efficiency can play in this equation and the positive economics of increased efficiency in the Russian case.

If Russia were to adopt a comprehensive energy efficiency program, it could reduce its CO₂ emissions by 793 million tons per annum, which represents around half of its total emissions in 2005. Put another way, Russia could reduce greenhouse gas emissions by 20 percent compared with 1990 levels through energy efficiency measures alone. Although energy efficiency has become a priority for Russia in recent years, policies are changing very slowly and, until Medvedev's recent speeches, policymakers have yet to link efficiency policy with measures to address climate change. In the Russian case, gains from efficiency make addressing global warming a potential driver of economic growth, modernization, and innovation. Russia has incentive to pursue these gains in any case; the argument here is that climate policy should be explicitly linked to the drive to increase efficiency.

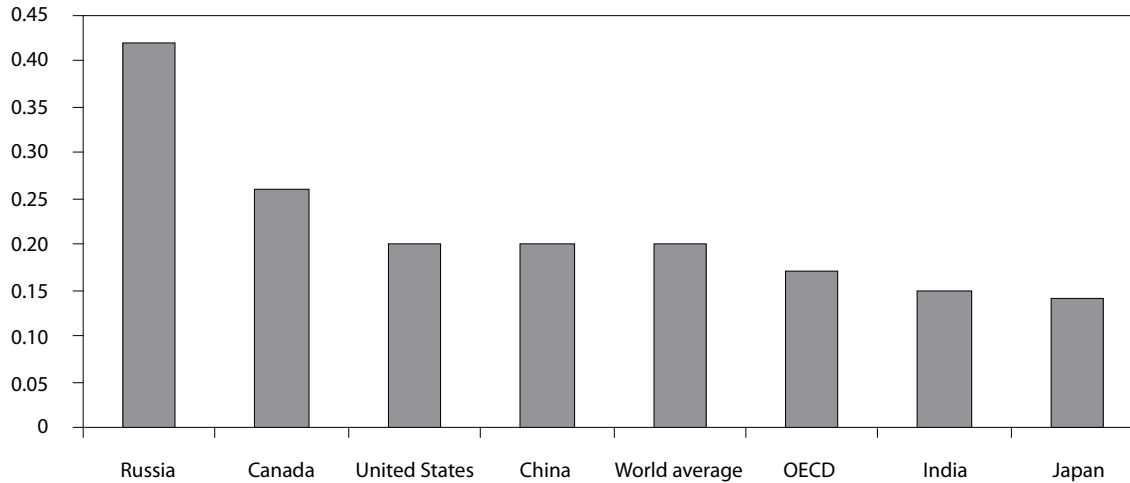
Russia's energy efficiency deficit is striking. It is the world's eighth largest economy but the third largest consumer of energy. Of the world's top ten economies, none consumes more energy per unit of GDP than Russia. In fact, Russia's energy intensity is two to three times higher than in any industrial country (figure 6.3), higher than any of the other BRICs (Brazil, India, and China), and over two times higher than the world average. Even Canada, which has similar climatic conditions, consumes around three times less energy per unit of GDP. The energy intensity of the economy is a fundamental challenge to Russia's future development.

Russia's energy intensity is a function of inefficiencies at all levels, from the end users to the producers of energy (figure 6.4). Households cannot adjust the temperature of their radiators and often do not even have the option of switching them off. As a result, many regulate heat by opening windows, which accounts for a loss of energy comparable to the entire volume of energy produced by Russia's nuclear power plants.²⁹ In total, Russia loses over 60 percent of heat due to outdated municipal heating networks. An enormous amount of power is also wasted by end users who have no incentive to conserve due to the artificially low price of electricity.

29. Vyacheslav Kulagin, "Energy Efficiency and Development of Renewables: Russia's Approach," *Russian Analytical Digest* 46 (September 25, 2008), 4.

Figure 6.3 Energy intensity of selected countries, 2007

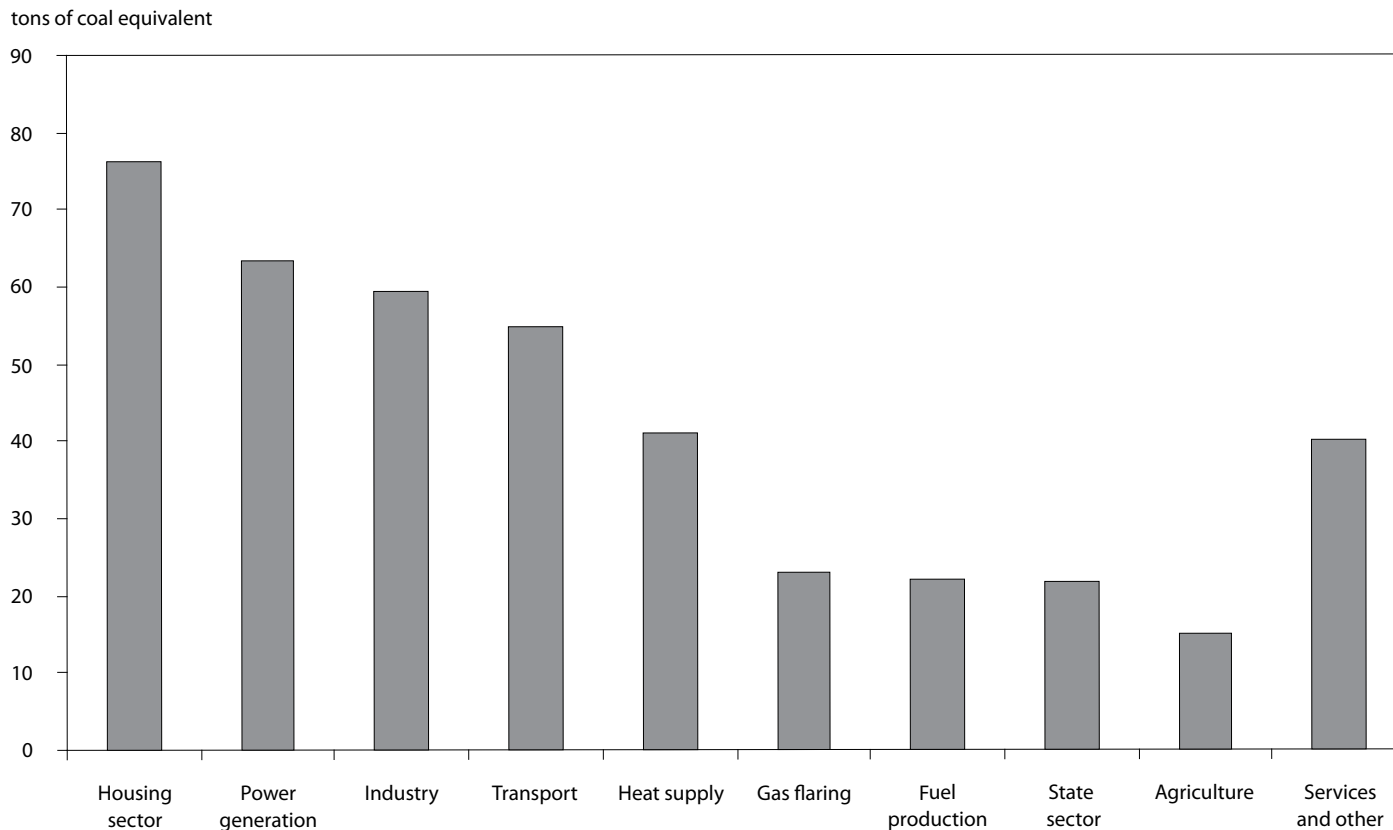
ton of coal equivalent per \$2,000 of GDP measured in purchasing power parity



OECD = member states of the Organization for Economic Cooperation and Development

Source: International Energy Agency, *Key World Energy Statistics*, 2009.

Figure 6.4 Energy-saving potential in Russia, by sector



Source: Energy Forecasting Agency, Proekt "Energoeffektivnaya ekonomika: Energoeffektivnost" [Project "The Energy Efficient Economy: Energy Efficiency"], 2008, <http://e-apbe.ru> (accessed on January 15, 2010).

Modernization-driven energy efficiency is rare in Russian industry. Most of the existing industrial capacity was installed several decades ago and is highly inefficient. Further, few attempts have been made to rectify this situation: Depreciation of capital stock is over 46 percent in the natural resource extraction sector, 53 percent in transport, 54 percent in communications, 70 percent in the thermal power sector, and about 80 percent in hydropower.³⁰ Not only is industry dated, but it also suffers from the Soviet legacy: Before 1991, targets were set to *increase* the power consumption to personnel ratio (*energovoorozhennost'*), which was considered a sign of the country's industrial progress. This misguided Soviet policy was a roadblock to increasing efficiency in the Russian metallurgy, oil and gas, and chemical sectors.

One of the main concerns about effectiveness of energy-saving policy is the role of monopolies in Russian economy. Energy suppliers are often interested in higher demand for energy, not improvement of energy efficiency, energy saving, or introduction of alternative energy sources. Large oil and gas companies as well as electricity suppliers are natural monopolies in most of Russia's regions, and they will likely limit the effectiveness of policies and programs planned by the government.

Energy producers waste staggering amounts of energy resources. The efficiency of power plants, especially coal-fired ones, 40 percent of which were built over 40 years ago, is far below the world average. Russian oil producers flare as much as 38 billion cubic meters of associated gas annually, which is approximately the volume of gas Russia sold to Germany, its largest customer, in 2006. In that same year 39 billion cubic meters were burned in compressor stations or leaked.³¹ The electricity grid and heat distribution network are no less wasteful: The energy consumed by power stations, lost in power grids, or used in the heat network is approximately equivalent to Poland's annual power consumption.

Energy-Saving Potential

Various domestic and international organizations have estimated Russia's potential for energy efficiency improvement. In the most authoritative study, the World Bank together with the Russian Center for Energy Efficiency (CENEF) in 2008 found that Russia could save 45 percent of its total primary energy consumption if it were to implement a comprehensive

30. Rosstat data for 2009 and Audit Chamber report on RAO UES investment program, 2006, www.ach.gov.ru (accessed on January 31, 2010).

31. PFC Energy, *Using Russia's Associated Gas* (report prepared for the Global Gas Flaring Reduction Partnership and the World Bank, December 10, 2007), www.worldbank.org (accessed on January 18, 2010).

reform program.³² According to their calculations, with the right policy measures Russia could save:

- 240 billion cubic meters of natural gas,
- 340 billion kilowatt hours of electricity,
- 89 million tons of coal, and
- 43 million tons of crude oil and petroleum products (measured in crude oil equivalents).

In total, Russia could achieve savings equivalent to all energy produced and imported (net of exports) by France or the United Kingdom. And the Russian economy could benefit from \$120 billion to \$150 billion in energy cost savings and increased gas exports *annually*.³³ It is important to note that the World Bank/CENEF study assumes implementation of a reform program that would cost the economy \$320 billion (although its authors claim that this amount would be paid back in four years).

Another study, by McKinsey & Company, outlined 60 measures aimed at increasing energy efficiency over two decades. The program would keep Russia's energy consumption at today's levels while its economy doubles in size, cutting energy intensity by a total of 64 percent compared with 2007 (figure 6.5).³⁴ These measures would cost €150 billion over the 20-year period, but the report contends that Russia could see savings of over twice that amount in the same period. This amounts to an average rate of return above 30 percent.³⁵ Other studies assume less ambitious plans but nonetheless demonstrate the astronomical potential for savings.³⁶

Impact of the Economic Crisis

As has been the case in practically every aspect of Russian policy, the global economic crisis has had a major impact on energy efficiency plans and programs. On the one hand, the crisis affected the government's approach to energy efficiency reform. Unlike the business-as-usual approach seen in previous years, more aggressive policy measures were adopted.

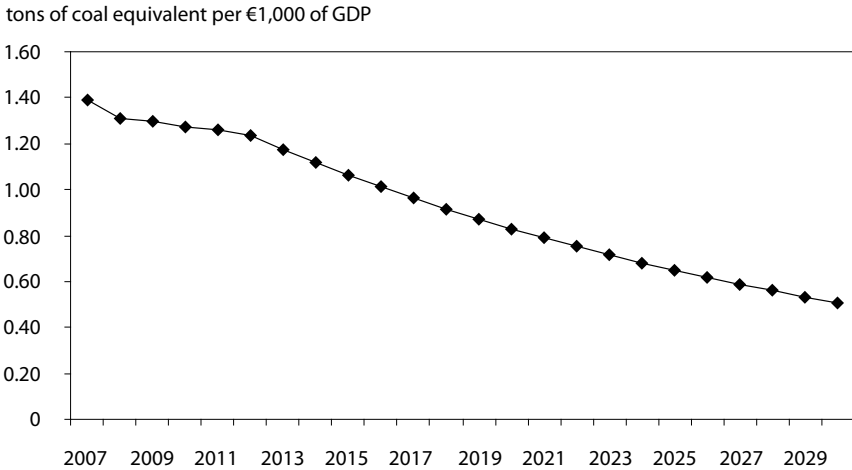
32. World Bank, *Energy Efficiency in Russia: Untapped Reserves* (Washington, 2008).

33. *Ibid.*, 5–6.

34. This number assumes a natural improvement of 40 percent in energy efficiency by 2030; it adds around 24 percent to that—more than the total annual consumption of Canada today.

35. McKinsey & Company, *Pathways to an Energy and Carbon Efficient Russia* (Moscow, 2009), www.mckinsey.com (accessed on January 31, 2010).

36. See, for example, Energy Forecasting Agency, *Proekt "Energoeffektivnaya ekonomika: Energoeffektivnost"* [Project "The Energy Efficient Economy: Energy Efficiency"], 2008, <http://e-apbe.ru> (accessed on January 15, 2010).

Figure 6.5 Reduction in energy intensity assuming implementation of McKinsey program

Source: McKinsey & Company, *Pathways to an Energy and Carbon Efficient Russia* (Moscow, 2009), www.mckinsey.com (accessed on January 31, 2010).

For example, the government's anticrisis program included requirements for recipients of funds from the stimulus package to have an energy efficiency plan. On the other hand, the crisis forced substantial reductions in corporate investment programs, including modernization of energy infrastructure and energy transportation networks. This is particularly true of the electricity sector, which saw a 4.5 percent drop in demand in 2009, as well as the other sectors affected by the global decline in demand, such as metallurgy and chemicals.

What's at Stake for Russia?

In addition to the benefits for emissions reductions, reducing Russia's energy intensity is a critical component of its future development, for several reasons.³⁷

- *Ensuring energy security.* Energy generation capacity limits and increasing demand by domestic industries mean that improvement in energy efficiency is a key component—and perhaps the only possible component that can be realized in the near future—for ensuring adequate energy supply.
- *Maintaining competitiveness.* Greater energy efficiency would allow companies to remain competitive by cutting overall production costs.

37. All statistics are from World Bank, *Energy Efficiency in Russia*, except where noted.

- *Increasing oil and gas exports.* Russia's high energy intensity costs the government about \$100 billion per year in forgone export revenues, or about 35 percent of the 2008 federal budget.
- *Economizing budgetary outlays.* Over \$3 billion can be saved annually from federal and local budgets by reducing inefficient use of energy.
- *Benefiting the nation's health.* Energy saving would reduce air pollution, in particular by cutting nitrogen oxide, sulfur oxide, particulates, and other harmful substances in the atmosphere. According to recent estimates, air pollution causes over 88,000 premature deaths in Russia, and total damage from related illnesses and mortalities is about \$14 billion per year.³⁸
- *Diversifying the economy.* Greater energy efficiency would free up capital for investment in other sectors and help diversify the economy.

Energy Efficiency Policy

In Russia policymaking on energy efficiency is nominally based on several framework documents. For example, the Energy Strategy to 2030 provides the long-term (20-year) vision for the development of the energy sector and outlines policies and measures required to reach priority targets. In contrast, federal programs cover medium-term and interim targets. While various normative acts on energy efficiency have been passed over the course of the post-Soviet period, only in the past two years has the government moved decisively to address the issue. Russia's current priorities in energy efficiency policy are determined by the following legal acts:

- In June 2008, President Medvedev signed a decree calling for an overall reduction of energy intensity by no less than 40 percent by 2020 vis-à-vis 2007 levels. The decree also included provisions on rational and environmentally sound use of energy and budgetary support for renewable energy projects.
- In November 2009, the government approved the Energy Strategy to 2030,³⁹ which is part of a \$2 trillion-plus three-stage plan to develop the energy sector in the country by 2030. The main goal of the first stage is to minimize the impact of the ongoing economic crisis on the energy sector and pave the way for postcrisis development. The second stage would focus on improving energy efficiency. By the end of the third stage, Russia is expected to have switched to highly efficient

38. Laura A. Henry and Vladimir Douhovnikoff, "Environmental Issues in Russia," *Annual Review of Environment and Resources* 33 (2008): 437–60.

39. See Energeticheskaya strategiya Rossii na period do 2030 goda [Energy Strategy of Russia for the Period up to 2030], available at www.minenergo.gov.ru, for the original text (accessed on January 31, 2010).

use of traditional energy and to have greatly increased the role of alternative energy.

- Later in that same month, President Medvedev signed the Law on Energy Saving and Improvement of Energy Efficiency (hereafter, the Law on Energy Efficiency). This is the primary normative document setting out the Russian government's policy in this sphere. It sets both the general framework for federal policy aimed at substantial improvement of energy efficiency and specific priority targets and mechanisms to achieve them. The range of these targets is fairly wide, from consumer products and construction requirements to creation of markets for energy-efficient technologies (box 6.2).
- The planned State Program on Energy Saving and Energy Efficiency Improvement to 2020 will determine federal policy and measures to reduce energy intensity by 2020.

Politics of Energy Efficiency

As the previous section shows, there has been significant legislative activity, most importantly the presidential decree and the Law on Energy Efficiency, in the energy efficiency sphere since mid-2008. To a significant degree, credit for this shift is due to President Medvedev, who has made energy efficiency a primary component of his modernization agenda, which is the centerpiece of his presidency. At a meeting of the State Council in July 2009, he said: "Energy efficiency needs to serve as a foundation, with other development priorities based on it. To put it differently, energy efficiency must support all the other priorities for technological modernization.... We seem to be falling behind in every respect...not only because of the difficulties we faced in the 1990s and even earlier, but also because of our mindset, because we have never tried to save energy.... It is true that we are the world's leading nation in terms of energy resources. This does not mean, however, that we should consume these resources irresponsibly."⁴⁰ While the distance between words and deeds is a long one in the Russian context, it is nonetheless important that the president has made efficiency a top priority.

In fact, in addition to the presidential decree and the Law on Energy Efficiency, some other concrete steps have also been taken. For example, energy efficiency is the first of five priorities for the newly created Commission on Modernization and Technological Development of the Economy. Medvedev appears to be using the commission as a platform for establishing himself as an independent political actor. Its meetings receive

40. Opening remarks at Expanded State Council Presidium Meeting on Improving Energy Efficiency of the Russian Economy, July 2, 2009, <http://eng.kremlin.ru> (accessed on January 31, 2010).

Box 6.2 The Law on Energy Efficiency

The Law on Energy Efficiency was adopted on November 23, 2009. Some of the primary envisioned actions include incremental regulation of incandescent lamp use, culminating in an outright ban in 2014; installation of metering equipment for water, power, and heat use in the residential sector by 2011; and energy labeling of household appliances by 2011.

The law requires regular obligatory energy audits (at least once in five years) for all state-owned and state-regulated enterprises, as well as the top energy-producing and energy-consuming companies. The first energy audit is due by the end of 2012, which will provide unprecedented nationwide data on energy inventory. Another new approach is the creation of long-term energy-servicing contracts, rather than annual ones, which undermined incentives for energy saving in municipal heating and water treatment facilities.

The law requires organizations accepting financial support from the state to produce energy-saving and energy-efficiency plans and creates provisions for the monitoring and enforcement of this requirement.

It also provides for financial support for energy-efficiency and energy-saving programs in education; public awareness campaigns; regional and municipal programs; and subsidization of energy-efficient technologies.

heavy media coverage, and it has been allocated 10 billion rubles in the 2010 budget.⁴¹

At its first meeting devoted to energy efficiency, the commission approved six projects: installing devices to meter and regulate energy consumption; replacing existing lighting systems with more efficient technologies; initiating pilot projects to modernize certain city districts and towns; increasing the efficiency of government services such as health care and schools; replacing the technology of heat supply; and creating projects in alternative and renewable energy.

Yet, despite the new legislative initiatives and the president's focus on the issue, the politics of energy efficiency are for the most part not conducive to addressing the problem. On the societal level, awareness of the importance of saving energy and knowledge of the means of doing so are extremely low. Information on the efficiency of consumer goods is scarce, and Soviet-era attitudes toward energy usage (i.e., taking cheap energy as a given and treating utility services as public goods) persist. Industry managers also have yet to adopt a productive approach to the issue.

41. See Natalia Kostenko, "Podpitka innovatsii" [Nourishing Innovation], *Vedomosti*, October 28, 2009, www.vedomosti.ru (accessed on November 1, 2009).

On the conceptual level, the proliferation of strategies and other conceptual documents undermines goal-oriented behavior and long-term planning. The Law on Energy Efficiency, the Energy Strategy to 2030, the State Program on Energy Saving and Increasing Energy Efficiency to 2020, the Long-Term Concept of Socio-Economic Development to 2020, and the General Scheme of Location of Objects of Energy Consumption are among the multitude of documents that touch on energy efficiency. Many of these documents contradict one another. Russia has had strategy documents for energy efficiency for over 15 years, but they have had little impact.

On the bureaucratic level, Medvedev faces several hurdles to realizing his goals. First, his programs tend to focus on ends and ignore the means of achieving them, thus leaving implementation to the bureaucracy, which is notorious for its low implementation capacity and weak institutions. This is particularly true in the energy efficiency sphere, where the lead agency, the Ministry of Energy, largely remains a “line ministry”—i.e., it sees its essential function as lobbying the interests of the industry. The Ministry of Economic Development appears to be the most proactive government entity on these issues, but it lacks the institutional clout and legal authority to take the lead.⁴² The situation is further complicated by the existence of a plethora of deputy prime ministers, at least three of whom have jurisdiction over efficiency-related issues.

Medvedev’s program also reflects a nonmarket approach to encouraging the private sector to adopt energy-saving measures. Instead of creating incentives for businesses to adopt energy-saving technologies, the Russian government’s initiatives reflect its proclivity for heavy-handed interference in the economy. In contrast to his February 2010 speech, Medvedev himself suggested that law enforcement agencies should be responsible for monitoring adoption of energy-saving technologies: “Let the FSB [Federal Security Service] and the militia report on this—that’s an excellent source of information.”⁴³ Such an approach is unlikely to yield sustainable results.

That said, the government’s unwillingness to turn to incentives as opposed to rigid enforcement might reflect an acknowledgment of the monopolized nature of the Russian economy, and particularly the energy sector. The monopolies or oligopolies that exist in oil, gas, and electricity not only are inherently resistant to greater efficiency but also often render moot the economic incentives created by regulations.

Finally, social, economic, and political costs are associated with increasing energy efficiency. In no area is this more true than residential gas prices. Although the Russian government is widely considered immune

42. Samuel Charap and Georgi Sofonov’s interview with Oleg Pluzhnikov, department director, Ministry of Economic Development, October 2009.

43. “Rossiiskii put’ k energoeffektivnosti” [“Russia’s Path to Energy Efficiency”], *Nezavisimaya Gazeta*, October 2, 2009, www.ng.ru (accessed on November 1, 2009).

to public opinion, decision makers do appear to take social consequences into consideration when contemplating increasing gas prices. This phenomenon can be seen in both the government's reluctance to raise prices significantly before the 2007–08 electoral cycle and its reduction in planned price increases during the economic crisis.

Efficiency Is Only Part of the Puzzle of Addressing Climate Change

The difficult politics of increased efficiency notwithstanding, it is clear that Russia stands to make major economic gains from an ambitious efficiency program. And, as noted earlier, Russia can go a long way toward reducing its emissions through such a program. However, as Medvedev himself noted in the February 2010 speech, structural changes in Russia's economy can be a significant piece of the puzzle of reducing its emissions. Indeed, the increased share of the services sector in the economy and the decline of some Soviet-era heavy industry since the late 1990s have been important factors in reducing Russia's emissions. If Medvedev's modernization agenda is realized, these trends will continue.

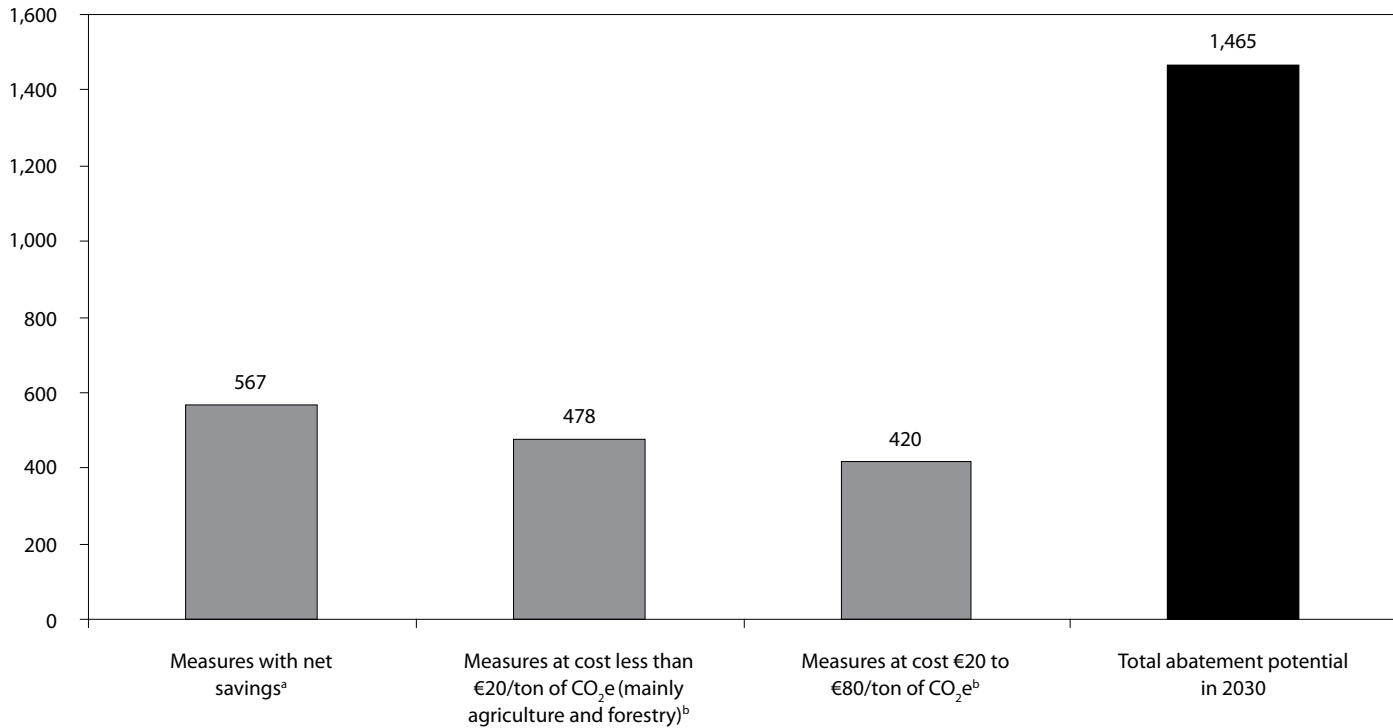
The Russian government could also adopt a more aggressive program of climate change mitigation. The McKinsey study concluded that Russia's total emissions reduction potential is approximately 45 percent of the 1990 baseline by 2030 (figure 6.6). The economically beneficial efficiency measures in the study would account for almost a third of this potential. The rest could be achieved through an aggressive investment program of €410 billion over 20 years, which would result in €90 billion in savings. Specific measures would include carbon capture and storage; fuel mix changes in the power and heat sector; and agriculture and forestry sector investments. Although some of these measures do not provide a direct economic benefit, they do entail potentially significant indirect benefits, including the "green jobs" and development of new technologies that Medvedev referenced in his February 2010 speech, through the stimulus spending required to implement them. Indeed, multiple new studies suggest that these benefits outweigh the costs in other country settings.⁴⁴ For example, one study of this dynamic in the United States demonstrated that investing \$150 billion in clean energy would create an estimated 1.7 million new jobs.⁴⁵

44. For a partial list, see Center for American Progress, *The Hub: Resources for a Clean-Energy Economy*, www.americanprogress.org/projects/energy_hub. This perspective is of course not shared by all economists who have looked at the issue.

45. Robert Pollin, James Heintz, and Heidi Garrett-Peltier, *The Economic Benefits of Investing in Clean Energy* (Amherst and Washington: Political Economy Research Institute at the University of Massachusetts and Center for American Progress, June 2009), www.americanprogress.org (accessed on January 13, 2010).

Figure 6.6 Greenhouse gas emissions abatement potential in 2030

million tons of CO₂ equivalent



a. Energy efficiency and emissions reductions measures.

b. Emissions reductions measures.

Note: In 2007 Russia emitted approximately 2,200 million tons of coal equivalent compared with 3,300 million tons of coal equivalent in 1990.

Source: McKinsey & Company, *Pathways to an Energy and Carbon Efficient Russia* (Moscow, 2009), www.mckinsey.com (accessed on January 31, 2010).

An Opportunity for US-Russia Engagement

Moscow's newfound interest in energy efficiency and its role in the international climate regime open new avenues for US-Russia bilateral engagement. This is particularly true in the energy efficiency sphere, for several reasons. First, it is a domestic policy priority of both President Medvedev and US President Barack Obama. It is unusual to have convergence between domestic political priorities and potential avenues of bilateral cooperation in the US-Russia relationship. This factor not only creates avenues for such synergies but also makes it more likely that the presidents will exercise political will to push policies through the bureaucracy, where great ideas are often undermined or delayed in both countries. Second, it is a win-win issue—both countries stand to gain from such cooperation. This contrasts with other issues on the bilateral agenda, such as Iran, which entail one side asking the other to act on one of its policy priorities. Finally, it presents the possibility of involving the private sector and creating joint public-private partnerships, which would provide economic benefits for both sides and help cement the foundation of the relationship. Without strong business links between the two countries, the bilateral relationship will lack an anchor that could mitigate the impact of disputes on the political level.

Several European countries have developed significant ties with Russia on energy efficiency issues. Germany, for example, has established a joint energy efficiency center with Russia. The United States, however, lags far behind its European allies. The US Secretary of Energy and the Russian Minister of Energy signed a memorandum of understanding on energy efficiency cooperation, but the document envisions standard interactions between the respective bureaucracies; it is far from ambitious. A group in the Bilateral Presidential Commission deals with energy efficiency, but little concrete progress has been made thus far.

More imaginative approaches are needed to make energy efficiency a central issue in the US-Russia relationship. The United States can use its experience in working with China on industrial energy efficiency as a model. For example, the Lawrence Berkeley National Laboratory collaborates with Chinese scientists and the Chinese government on an industrial energy efficiency program to benchmark China's top 1,000 energy-consuming enterprises based on international standards. The United States and Russia can take advantage of public-private partnerships, sharing any new energy-saving technologies that emerge from this collaboration.⁴⁶

Addressing climate change directly also presents opportunities for bilateral cooperation. Currently, Russia is not linked to any emissions

46. See Andrew Light, Julian Wong, and Samuel Charap, "U.S.-Russia Climate and Energy Efficiency Cooperation: A Neglected Challenge" (Washington: Center for American Progress, June 30, 2009), www.americanprogress.org (accessed on January 31, 2010).

trading system and lacks the institutional capacity to do so. Although the United States does not have a national cap and trade system, it does have a number of highly successful markets such as the 1990s sulfur dioxide trading scheme and regional (Western Climate Initiative, Regional Greenhouse Gas Initiative, and Midwestern Initiative) and voluntary (Chicago Climate Exchange) carbon emissions trading initiatives. The United States can create incentives for these trading centers to collaborate with Russian partners to launch pilot emissions trading schemes there. Developing Russia's capacity in emissions trading will help place it in a better position to join a multinational trading scheme as a full participant if and when it agrees to begin stemming its current emissions.⁴⁷

47. Ibid.