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Energy Security and Conflict: A Country-Level Review of the Issues

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COVER PHOTO: Jeffrey Stark
Women carrying brush for cooking and household needs near Mount Entoto, Ethiopia 2008.

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EXECUTIVE SUMMARY

This paper seeks to fill a gap in the literature on energy security and conflict. Rather than looking at the potential for conflict as it relates to strategic issues, inter-state competition, or instability associated with resource abundance, the central focus of this paper is on the potential for conflict arising from the threats to the energy security of national populations and local communities. Its underlying premise is that the energy security-conflict relationship is highly context dependent. Individuals and social groups engage in conflict over energy issues when they perceive that their way of life is imperiled, or they have been dealt with unjustly, or as part of a larger constellation of grievances about the political and socioeconomic conditions within which they live.

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Organized around three major sources of energy (oil and gas, traditional biomass, and hydropower), the analysis examines problems of actual or potential conflict related to energy provision, access, distribution, and reliability through illustrations from eight countries with very different national contexts and levels of development: Iraq, Dominican Republic, Ukraine, Chad, Democratic Republic of the Congo (DRC), Somalia, Sudan, and Cambodia.

Between 2005 and 2030, global demand for energy is predicted to increase by approximately 50 percent, with most of the demand coming from non-OECD countries and fossil fuels remaining the dominant source. At the same time, the relative distribution of energy resources is shifting. Regions such as West Africa, Central Asia, and parts of Latin America have acquired greater global significance as energy providers. However, in many developing countries, oil, natural gas, and coal provide a much smaller percentage of energy needs than traditional biomass, such as fuelwood, charcoal, dung, and crop residues. Some 2.5 billion people use traditional biomass for their cooking and heating needs. Many low-income countries are likely to rely predominantly on traditional biomass for several decades to come. While the social and environmental concerns raised by the Report of the World Commission on Dams in 2000 reduced funding for large hydropower projects by the World Bank and other donors, the need for power in poor countries with untapped water resources is driving a new series of major hydropower projects. In a number of cases where traditional donor agencies have been hesitant to proceed, China is both providing financing and undertaking the construction of these projects.

For populations in communities, towns, and cities in the developing world that need electricity for cooking, heating, and other daily needs, as well as in support of their businesses and livelihoods, unexpected or dramatic changes in electricity provision can be destabilizing. In an already conflictive setting like Iraq, these problems are even more acute. In the immediate postwar years

(2004–2006), the inability of the Coalition Provisional Authority and its successors to return electricity service to prewar levels sparked numerous protests and called into question the legitimacy of the entire post-Saddam government. Moreover, these failures were used as recruiting mechanisms by the insurgents, who then targeted electricity infrastructure for both tangible and symbolic purposes. In Iraq, even amid much deeper conflict problems, electricity provision took on a central role in the effort to suppress violence and establish minimum conditions of stability.

Even under peaceful conditions, as in the Dominican Republic, failures in the electricity sector can result in protests and conflict. The Dominican Republic's perennial electricity crisis developed and persisted in the context of four decades of rapid population growth, increasing urbanization, import-led industrialization, and rising expectations among an emerging middle class and poor majority. Electricity generation has always lagged behind demand. The institutional and political framework that defined the electricity sector had its origins in dictatorship and monopoly state control that encouraged the public to think of electricity as a quasi-public good. This made rationalization of the electricity sector hugely difficult for the democratic governments that followed because the transition to a more productive and more accountable market-based system entailed sudden price increases that could not be borne by poor citizens. With repeated reform efforts faltering and blackouts continuing, tensions have resulted in sporadic outbursts of violence and loss of life.

As a result of a series of disputes with Russia, its source of natural gas, Ukraine has experienced two major cold-weather disruptions in the delivery of much-needed energy for heating and other needs. However, in terms of citizen unrest and the potential for conflict, cross-border tensions with Russia are only part of the story. The gas crises have intertwined with the key internal problems facing the country, which include political in-fighting, corruption, and governance failures. The government's response to episodes of energy insecurity is seen by the public through the prism of these larger questions. Moreover, leading political figures and politically influential business leaders are perceived to be enriching themselves through links to the energy industry. In Ukraine, as well as in countries like Bulgaria, Serbia, and Bosnia-Herzegovina, energy crises are not likely to be sufficient causes for conflict by themselves, but their intersection with other forms of citizen discontent and associated perceptions of incompetence and corruption can be destabilizing.

Energy insecurity is radically different in much of the developing world. Poor populations in Africa and Asia, in particular, are reliant on traditional biomass, including wood, charcoal, straw and dung for cooking, heating, and other household energy requirements. The FAO predicts that fuelwood will remain the predominant energy source in the developing world because high oil and gas prices will make those fuels too costly for most households.

The cases of Chad, Democratic Republic of the Congo, and Somalia bring to light another important variant of the relationship between energy security and conflict—the conversion of traditional biomass from an item for personal household consumption in the countryside to a market commodity in the form of charcoal for mostly urban dwellers.

Citing fears of impending desertification as a result of tree felling for charcoal, the government of Chad recently began enforcing a total ban on charcoal and wood products entering the capital of N'Djamena. As a consequence of the resulting shortages, city residents soon faced fourfold price increases, and many households were forced to curtail energy use. The government sought to promote propane as an energy alternative, but even with a small subsidy it remained too expensive for most people. With no affordable alternatives, urban residents sought low-grade or improvised replacements, including furniture and rubbish, but in exasperation angry women took to the streets as well, to which the government responded with force. Making matters worse, Chadian authorities burned buses attempting to carry charcoal into the city, leaving vendors without income. Already besieged, the government was further destabilized by its energy policy miscalculations and its inability to respond to public protests without the use of force.

In DRC, a country already plagued by violent internal conflict, population growth and the resulting pressure on land are contributing to an unsustainable and illegal reliance on charcoal. The city of Goma, which hosts tens of thousands of IDPs, is particularly dependent on wood energy, and some 90 percent of the city's wood supply comes from Virunga National Park. Overall, three million people within a day's walk of the park rely on charcoal as their primary energy source. The high demand for charcoal has created a profitable, but illicit, market for traders who are illegally felling trees from the park at unsustainable rates. This charcoal trade is partly a by-product of the ongoing violence in DRC and the resulting lack of any sort of effective environmental governance and enforcement capacity. Both the national

army and rebel leaders have been linked to the charcoal trade. Corruption and the absence of legal authority have opened the doors for conflict entrepreneurs, who have acquired financial benefits that have brought both personal gain and fanned the flames of conflict.

In Somalia, the absence of central authority and the breakdown of traditional resource management have created an opening for new groups to cut down large swaths of the region's remaining acacia forests in order to make charcoal for export to Saudi Arabia and other Gulf countries. Pastureland has become more arid, and water resources have become scarcer. Reports indicate that the situation has spurred conflict between charcoal traders and local communities. Several clans have attempted to address these tensions by regulating or banning charcoal production, but without success. The effects of this unregulated charcoal trade are likely to add to the already existing tensions and conflict in the region and deepen Somalia's already severe environmental challenges in the future.

One of the clearest historical linkages between energy security and conflict is found in the controversies and unrest related to hydropower and the building of dams. While local complexities are still important, the discontent and tensions created by dams are fairly similar across regions. Projects often have profound environmental, economic, and social impacts. Governments frequently find themselves at odds with citizens fearing for their land, livelihoods, and ways of life. Aggrieved communities mobilize around issues that range from displacement and compensation to alternative livelihoods, sometimes assisted by anti-dam advocacy networks.

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The Government of Sudan is planning an ambitious set of dams on the Nile River in the country's northern region of Nubia, including the Merowe and Kajbar dams, which will displace thousands of people and dozens of villages. Ethnic tensions, poor governance, compensation issues, and a lack of accountability in financing have generated unrest. Local groups claim there have been repeated human rights violations, including killings, arrests, and forced displacement. As the tensions escalate, so too have fears that the region will experience broader unrest. The mobilization of Nubian communities around these issues results in part from pre-existing feelings of marginalization and persecution. Nubians are angry not just about the impact that the dams will have on their land and livelihoods, but also at what they view as longstanding patterns of economic and social exclusion. For some groups, such as the Kush Liberation Front, protests against the dam have merged with a larger agenda of replacing the government in Khartoum.

Cambodia also faces controversies over dam-building, although in a less conflictive environment and at an earlier stage of development. After years of war and neglect, only 18 percent of the population has access to electricity, and only major urban centers have 24-hour electricity. Cambodia is aiming to produce thousands of megawatts of hydropower and has set out an elaborate agenda that includes nine priority dam projects that are moving forward. However, both domestic and international NGOs have expressed concern that there may be serious negative consequences for both people and wildlife. The largest project, Kamchay Dam, is located within Bokor National Park and will flood 2,000 hectares of protected forest. In March 2009, villagers blocked access to a quarry providing stone for the dam's construction and demanded that the Chinese firm building the dam pay compensation for property

destroyed by blasting at the site. Cambodia already has a history of corruption and poor natural resource management in the forestry sector. These problems have brought protest from local communities and NGOs as well as increasing scrutiny from domestic and international media. After the genocide of the 1970s, Cambodians are hesitant to engage in conflictive actions. As Cambodia's dam-building program advances, however, protests and confrontations may increase in number.

These individual country cases reinforce the view that the nature of the energy security-conflict linkage is very largely a function of the specific political, economic, social, cultural, and historical context of a country. Disaggregating these factors strengthens the analysis of grievances, drivers, resilience, and windows of opportunity for outbreaks of conflict or conflict mitigation, and it sheds light on one of the most important considerations of all—the horizon of expectations of the relevant population. Insecurity, discord, protest, recruitment, organization, instability, unrest, and violence are products of human behavior, which is structured by a wide array of country-specific experiences, both historical and lived as well as intangible and symbolic.

All of the cases examined involved serious problems of governance. In the developing world, amid rising expectations, governments continue to fall short in terms of not only infrastructure but also the regulatory and enforcement capacity to ensure adequate energy, reasonable access, equitable distribution, and some degree of reliability. If citizens perceive that their material needs related to energy are not being met, especially in urban areas, they are likely to mobilize and protest, and in poorly governed states those protests are likely to interact synergistically with other core grievances. However, grievances also often develop out of frustrations and anger that are fuelled by a lack of reliable information and a sense of exclusion. Much more could be done by development agencies to build the capacity of civil society organizations and community groups to collect and share information about key energy issues and strengthen public participation.

In many countries, the core challenge is to develop an efficient and rational power sector amid historically embedded political relationships that are highly dysfunctional and inefficient. But the transition to a more autonomous, accountable, and robust regulatory environment can be fraught with conflict. Development practitioners need to keep in mind these risks and link the "rationality" of reforms to the complexities of the broader political economy.

The findings of this preliminary review indicate that there is a consequential relationship between energy security and conflict in a variety of developing and conflict-prone countries. Often energy problems are significant amplifiers of conflict that add to the stresses of already fragile states. However, very few current programs and projects directly address actual or potential energy-related conflicts. The energy-conflict relationship can be researched in a meaningful way that attends to the specificities of context while also identifying significant patterns and accumulating the empirical basis for crafting program options. As a first step toward encouraging further thinking about energy security and conflict, a set of sample questions for practitioners is given at the end of this document in Appendix 11.

INTRODUCTION

This paper seeks to fill a gap in the literature on energy security and conflict. Most discussions of energy security and conflict deal with strategic geopolitical issues and inter-state disputes or the paradoxical relationship between resource abundance and underdevelopment. This paper frames its discussion differently, focusing instead on the potential for conflict arising from threats to the energy security of national populations or local communities.

The discussion that follows examines the relationship between energy security and conflict as it unfolds in the interactions among individual circumstances, citizen perceptions, civil society responses, institutional interests, and the exercise of governance in national settings. The focus is on countries of the developing world and other conflict-prone states. Its underlying premise is that the energy security-conflict relationship is highly context dependent. Individuals and social groups engage in conflict over energy issues when they perceive that their way of life is imperiled, or they have been dealt with unjustly, or as part of a larger constellation of grievances about the political and socioeconomic conditions within which they live. Occasionally, energy-related violence is driven by profit or even the desire to perpetuate conflict itself. These motivations and the capacity and opportunity to act upon them are molded by and contingent upon the political, economic, social, cultural, and historical circumstances of each country.

To provide background to the discussion that follows, the paper briefly reviews current and projected energy trends and contrasts the way energy security is typically analyzed with the country-focused approach used here. It clarifies the discussion of intended focus through consideration of the questions of levels of analysis and conceptual approach.

Despite the primacy of context, the examination of specific country cases indicates that certain patterns emerge in relation to different energy sources. Most of the paper is devoted to the discussion of a number of specific country cases by clustering them in relation to three principal energy sources: fossil fuels (largely oil and gas); traditional biomass; and hydropower. The section on oil and gas examines the cases of Iraq, Dominican Republic, and Ukraine; the section on traditional biomass looks at Chad, Democratic Republic of Congo, and Somalia; and the section on hydropower considers developments in Sudan and Cambodia. The discussion of energy sources and conflict vulnerability in specific country cases is followed by a review of initial lessons learned from the analysis. The paper concludes by identifying gaps in our knowledge about energy security and conflict as an issue-area, and offers some preliminary ideas about considerations for development agencies and possible programmatic responses.

THE GLOBAL ENERGY CONTEXT

"...global shifts and the competition for fossil fuels among industrialized nations are far from the full story of the search for energy."

Global demand for energy is predicted to increase in the coming decades. The International Energy Agency's (IEA) 2007 World Energy Outlook states that between now and 2030, "global energy needs are expected to grow, with fossil fuels remaining the dominant source" (IEA 2007b). Between 2005 and 2030, energy needs are projected to expand by 55 percent, with demand increasing from 11.4 billion tons of oil equivalent (toe) to 17.7 billion toe (IEA 2007b). The U.S. Department of Energy provides similar estimates. Between 2005 and 2030, energy consumption is expected to increase by 50 percent, the bulk of the demand coming from countries outside the Organization for Economic Cooperation and Development (OECD) (DOE 2008). Oil, coal, and gas account for 35 percent, 29 percent, and 24 percent of global primary energy consumption, respectively. The global energy mix is not anticipated to change dramatically in the next 25 years. At present, renewable energy's share is less than 1 percent, and it is not expected to exceed much more than 5 percent by 2030 (Rühl 2010).

The IEA's 2007 World Energy Outlook estimates that coal production will expand from a 25-percent share of world energy consumption in 2005 to a 28-percent share in 2030. More than 80 percent of this growth will result from demand in China and India. IEA data project that developing countries will "contribute 74 percent of the increase in global primary energy use," with China and India making up 45 percent of that figure (IEA 2007b).

Some observers paint a rather bleak and conflict-ridden energy future—for example, Michael Klare (2008) predicts "a world of rising powers and shrinking resources [that] is destined to produce intense competition among an expanding group of energy-consuming nations for control over the planet's remaining resources of hydrocarbons and other key industrial materials." Nick Mabey (2007) argues that "geopolitical tensions rooted in bilateral energy alliances between countries are preventing—or weakening—global collective action to reduce other security threats." His examples include China's energy relationship with Sudan, which has hampered United Nations efforts in Darfur, and the way in which European and U.S. energy demands have discouraged efforts to prevent political backsliding in Russia and Central Asia (Mabey 2007).

The relative distribution of energy resources is shifting. Klare (2008) points out that as the competitive search for energy continues, "regions that once held abundant raw resources, but have been depleted of their original natural wealth, are

losing much of their geopolitical significance, while regions with untapped energy and mineral reserves have acquired sudden global significance." Thus, Central Asia has grown in prominence, and Africa is now a major source of oil and natural gas. China's search for energy resources in Africa and Latin America has attracted considerable attention from policymakers and has spawned a fast-growing literature (e.g., Li 2006; Alden 2007; Guerrero and Manji 2008; Roett and Paz 2008). In Latin America and the Caribbean, Venezuela has used its oil resources to advance its political influence with its neighbors. These changes in the distribution of energy resources are likely to reconfigure resource competition and geopolitical rivalries in ways that will present new challenges for conflict management.

There is considerable debate surrounding estimates of the world's fossil fuel reserves and what those estimates mean, especially with regard to the debate over when the moment of "peak oil" will be reached. Peak oil is the point of maximum world petroleum production, after which it is predicted to go into decline. Analysts like Matthew Simmons believe peak oil may have been reached already, while the EIA estimates peak oil may be reached by around the year 2030 (Maass 2005; DOE 2006). Many industry experts say that oil supplies will be significantly increased through the application of new technologies to existing oil fields that will increase markedly recoverable oil reserves (Mouawad 2007). There is debate as well about whether the arrival at peak oil will be followed by a plateau or a steady decline. However, the consumption of fossil fuels has continued to increase steadily. Between 1980 and 2001, global petroleum, coal, and natural gas use increased by 22 percent, 27 percent, and 71 percent, respectively (Chow et al. 2003). In an influential study conducted for the U.S. Department of Energy, Hirsch et al. (2005) state that while "world oil peaking is not known with certainty," chances are high that when peak oil is reached, "liquid fuel prices and price volatility will increase dramatically and, without timely mitigation, the economic, social, and political costs will be unprecedented." Moreover, Hirsch et al. (2005) warn that mitigation options "must be initiated more than a decade in advance of peaking."

New developments in natural gas exploration and the liquefied natural gas (LNG) market may help to somewhat mitigate these dislocations. Technological advances in accessing gas deposits are increasing production, and the global integration of the LNG market may increase diversification and provide Europeans and others alternatives to Russian and Central Asian gas deliveries. These are possibilities that will come to fruition over the medium to long term, if at all (Rühl 2010).

However, these global shifts and the competition for fossil fuels among industrialized nations are far from the full story of the search for energy. In many developing countries, oil, natural gas, and coal provide a much smaller percentage of energy needs than traditional biomass, such as fuelwood, charcoal, dung, and crop residues. The 2006 World Energy Outlook estimates that 2.5 billion people use traditional biomass for their cooking and heating needs (IEA 2006). Only 24 percent of the population in sub-Saharan Africa has access to electricity. Excluding South Africa, the installed generation capacity for the entire region is 28 gigawatts, which is roughly equal to that of Argentina (World Bank n.d.a). Of the 5 East African Community (EAC) members, 4 depend almost entirely on traditional biomass for their country's energy needs—traditional biomass is used by 68 percent of the population in Kenya, 90 percent in Tanzania, 93 percent in Rwanda, 93 percent in Uganda, and 94 percent in Burundi (Mwakisyala 2009).

Historically, reliance on biomass has decreased as income increases. Figure 1 illustrates this relationship for seven different countries. Nadejda Victor and David Victor (2002) refer to this as the "energy transition." While this process is not linear and varies in complex ways, the overall trend is that populations rely less and less on traditional biomass and shift more toward modern fuels as countries develop. Many low-income countries, however, are likely to rely predominantly on traditional biomass for several decades to come.

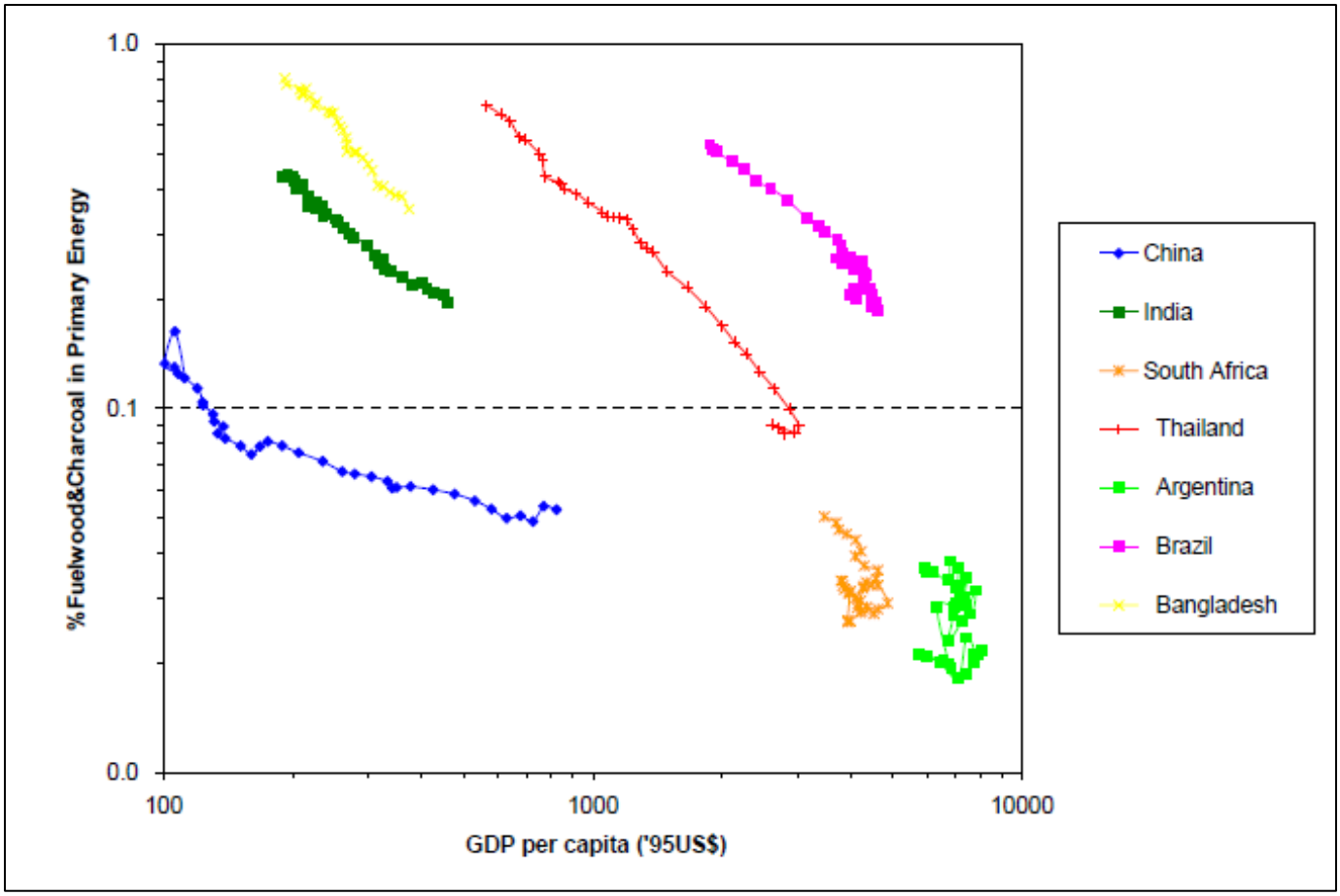
Between 1973 and 2006, global hydropower production increased from 1,295 terawatts per hour (TWh) to 3,121 TWh (IEA 2008). However, hydropower's share of electricity generation by energy source decreased from 21 percent to 16 percent over the same period of time (2008). IEA (2006) estimates that between 2004 and 2030 hydropower output will increase from 2,809 TWh to 4,749 TWh—an average annual growth rate of about 2 percent. However, hydropower's relative share of total electricity generation is projected to decline over this period from 16 percent to 14 percent (2006).

Overall, the prospects for future hydropower development are uncertain. The Report of the World Commission on Dams (2000) brought heightened attention to the cost overruns and negative environmental

and social consequences of many large dam projects of the past half century. This resulted in much more cautious lending and reduced financial support from international banks and institutions. Many projects experienced significant delays; others were abandoned. However, in response to rising energy costs, concerns over carbon emissions, and "a fragile but growing confidence in the sector," the World Bank (n.d.b) says that "Bank approvals for hydropower have risen from US$250 million/year in 2002–04 to more than US$800 million in Fiscal Year 2008." According to IEA (2006) estimates, less than one-third (approximately 31 percent) of hydropower's economic potential was developed as of 2004, with most of the remaining potential located in developing countries. The World Bank (n.d.b) now estimates that approximately 7 percent of worldwide undeveloped hydropower potential is currently under construction, with the Equator Principles—which provide environmental and social management benchmarks—serving as a guide for more sound project assessments. Nevertheless, the well-publicized legacy of controversial dam projects makes new dam-building initiatives in poorly governed countries a potential locus of conflict.

A final factor with uncertain implications for energy security is climate change. Carbon emissions into the atmosphere appear likely to continue to increase steadily. China, India, and other developing countries are now the main drivers of energy consumption increases, and coal, which has high carbon intensity, is the fuel of choice for many of these countries in terms of cost and availability. The December 2009 United Nations Climate Change Conference made very little progress in achieving agreed-upon reductions in carbon emissions. The potential changes that are predicted to occur under various climate change scenarios (including temperature increases, droughts, floods, and severe weather events) may threaten dwindling supplies of energy resources. Temperature changes could increase the demand for electricity to cool houses and buildings. Localized reductions in rainfall could reduce hydropower capacity. Increases in the severity and frequency of storms might threaten oil and gas production at sea.

Figure 1: The relationship between GDP and traditional biomass use



SOURCE: VICTOR AND VICTOR 2002.

Concerns over carbon emissions will increase pressures to decrease the consumption of fossil fuels. Some of these occurrences could increase tensions within and between countries. The 2003 European Union Security Strategy, for example, noted that consequences resulting from climate change could exacerbate pre-existing rivalries over natural resource demands, thus increasing the possibility for conflict (Solana 2007). While not a central focus of this paper, the overlap between climate change and energy security is likely to be consequential, although projections of how this relationship will play out are still highly speculative.

LEVELS OF ANALYSIS AND FOCUS

As David Baldwin (1997) has pointed out, there are several key questions always embedded in conceptualizations of security, regardless of the issue-area: Security for whom? Security for which values [e.g., way of life, basic needs, human security]? How much security? From what threats? By what means? At what cost? In what time period? The greater the consensus among relevant groups that these questions are finding satisfactory answers and responses, the lower the chance is that conflict will ensue. Conversely, dissensus about such core concerns and the real or perceived absence of security-enhancing measures will increase the prospect of conflict.

The first of these questions—Security for whom?—is especially useful in discussing energy security because it gets to the issue of level of analysis. Much has been written on energy security by international relations scholars, with a resulting emphasis on geostrategic or state-level analysis (e.g., Allenby 2000; Yeh and Lewis 2004; Deutch 2005; Giordano et al. 2005). These discussions highlight the role of global political factors, such as access to fossil fuels, strategic energy reserves, overseas exploration and operations, and the role of diplomacy. They highlight the importance of national expectations with respect to economic growth and stability. In the view of longtime energy expert, Daniel Yergin (2006), energy security must be viewed in terms of the "threat of terrorism, instability in some exporting nations, a nationalist backlash, fears of a scramble for supplies, geopolitical rivalries, and countries' fundamental needs for energy to power their economic growth." A report by the Asia Pacific Energy Research Center (2007) echoes this emphasis on the economic imperative driving energy security discussions, stating that energy security is the "ability of an economy to guarantee the availability of energy resource supply…at a level that will not adversely affect the economic performance of the economy." The International Energy Agency (2009) also takes this macro-level perspective, linking long-term energy security to "timely investments to supply energy in line with economic developments and environmental needs."

Other scholars emphasize the strategic aspects of energy security. For instance, Nick Mabey (2007) points out that energy security "encompasses a range of risks and threats over different timescales and different magnitudes," and some of these threats "are seen as fundamental threats to the nation; on a par with direct external military aggression." Viewing energy as a traditional or "hard" security issue has implications for the way that states interact. For instance, according to Roger Stern (2006), the importance of energy supplies in the Middle East dominates the relationship of states in the region: "Each firm-state's monopoly proceeds [oil revenues] are a

"Energy plays a direct role in ensuring human security in the form of livelihoods, food security, and health. …a lack of access to energy can become a symbol of larger issues of perceived injustice and unmet expectations. "

potential war prize to another… Their rents at risk of capture both allow and compel them to sustain some of the world's highest military spending per capita." However, what energy security means in terms of the global balance of power and inter-state disputes is beyond the scope of this paper.

Similarly, there is an extensive literature on energy resource abundance and conflict, or the so-called "resource curse" (e.g., Collier and Hoeffler 2002; Ross 2003; Ross 2004; Humphreys et al. 2007). Both qualitative and quantitative studies have shown that poorly governed petroleum-rich states in the developing world are unlikely to diversify their economies in ways that promote sustainable or broadly shared economic growth. Michael Ross (2001) has shown that there is a statistically significant, inverse relationship between oil abundance and democracy. The large energy resource rents obtained by state elites reduce the need for tax revenues and appear to block or undermine the mechanisms of representation and accountability between state and citizens that are characteristic of democratic countries. The socioeconomically polarized societies that have resulted in countries like Nigeria and Angola have been marked by high levels of protest, mobilization, and conflict. This is an issue-area in which there is considerable scope for a much more active set of interventions by donor agencies in relation to transparency, revenue flows, and capacity building at both the national and community levels. However, this important challenge also lies outside the main focus of this paper and is deserving of separate treatment (for more on the resource curse see Appendix 1).

Rather than looking at the potential for conflict as it relates to resource abundance, strategic, or inter-state energy security issues, the central focus of this paper is on the potential for conflict arising from the threats to the energy security of national populations and local communities. In other words, rather than viewing energy security from the standpoint of high politics, it mainly focuses on the potential for grievances, mobilization, unrest, instability, and violence from below.

Issues related to energy provision, access, distribution, and reliability can be key elements of situations leading to economic, social, and political instability and conflict. Energy security entails an adequate, affordable, equitable, and environmentally sustainable supply of energy goods and services ensuring the welfare of key sectors, groups, and communities. Conversely, energy insecurity implies an absence of these conditions and the possibility of actual or potential threats to livelihoods, social well-being, economic growth, and stability at the individual, community, subnational, and national levels.

The IEA (2007a) notes the importance of markets on household energy security, describing energy insecurity as the "welfare impact of either the physical unavailability of energy, or prices that are not competitive or overly volatile." Goldemberg et al. (2001) stress the need to consider energy not just as a household issue but also as it relates to "global issues such as poverty, population growth, food and undernutrition, and environmental degradation, to which energy is inextricably linked." The United Nations Millennium Development Project emphasizes the importance of energy to meeting the Millennium Development Goals (MDGs). Although none of the MDGs explicitly address energy sources or usage, the UN Millennium Project produced a full report on the energy sectors of developing countries and has called for the mainstreaming of energy issues into development planning (Modi et al. 2005).

Energy plays a direct role in ensuring human security in the form of livelihoods, food security, and health. In addition to energy's importance for meeting these basic needs, a lack of access to energy can become a symbol of larger issues of perceived injustice and unmet expectations. While at one level energy security is linked to global economic and political factors, at another level energy security is related to potential breakdowns in human security and an aggrieved sense of injustice, leading to increased tensions, disturbances, and violence.

SOURCES OF ENERGY, COUNTRY CASES, AND CONFLICT

"Circumstances that provoke strongly felt grievances or even unrest in one country may elicit little or no reaction in others."

OIL AND NATURAL GAS: ELECTRICITY PROVISION AND CONFLICT

Historical experience, social expectations, and the specificities of context are pivotal factors in relation to the potential for conflict. Circumstances that provoke strongly felt grievances or even unrest in one country may elicit little or no reaction in others. For communities, towns, and cities in the developing world that use electricity for cooking, heating, and other daily needs, unexpected or dramatic changes in provision can be destabilizing. Frequent or severe blackouts, brownouts, drop outs, and load-shedding can wreak havoc on an economy and society. (The leading energy source for electricity is fossils fuels, but other sources include nuclear, geothermal, biomass, solar, and wind energy.) Extreme situations—for example, if groups perceive a lack of reliable electricity provision as a marked injustice or an effort to control or marginalize them—open windows of vulnerability that can spark anger and protests.

There are numerous examples of electricity shortages throughout the world. However, the extent to which insufficient or erratic electricity has links to significant protest or violence is much more limited. In the following section, three cases in which electricity provision has served as a component of instability or violence are described. The very different examples of Iraq, the Dominican Republic, and Ukraine help illustrate some of the types of linkages that exist between the provision of electricity and conflict.

Iraq

Energy has played a role in the Iraq conflict in two distinct, but interconnected, ways. First, insufficient and irregular electricity provision provoked and amplified questions of effectiveness and legitimacy among the Iraqi population with respect to the U.S.-supported Iraqi government. Specifically, the lack of electricity has been a continual source of frustration for Iraqi citizens, especially those living in Baghdad, who were accustomed to uninterrupted service before the war. This became one of the principal grievances of the populace. The lack of reliable power contributed to an already volatile and unstable situation in the country.

Second, insurgent groups seeking to oust the occupying forces and bring down the nascent Iraqi government targeted energy infrastructure. Insurgent groups have sabotaged fuel supplies, smuggled fuel oil, attacked oil pipelines, destroyed electrical transmission installations, and targeted crews repairing energy infrastructure.

Among security analysts and those with counterinsurgency responsibilities, restoring electricity was quickly recognized as an important component to winning the war in Iraq. In a 2006 report assessing efforts to protect Iraq's energy infrastructure, the Special Inspector General for Iraq Reconstruction (SIGIR) began by stating that "Iraq cannot prosper without the uninterrupted export of oil and the reliable delivery of electricity" (Office of SIGIR 2006). The report also noted that, despite efforts to improve and protect infrastructure, "insurgent attacks, an aging and poorly maintained infrastructure, criminal activity, and lack of rapid repair capability have combined to hold down Iraq's oil exports and the availability of electricity," and victory in Iraq required the "protection of key infrastructure nodes and increasing the Iraqi government's capability to protect key energy infrastructure" (Office of SIGIR 2006).

Part of this recognition was economic. Between January 2004 and March 2006 alone, the Office of SIGIR (2006) estimated that Iraq lost approximately US$16 billion in oil revenue exports. Another element can be linked to living conditions and standards. As the U.S. Department of the Army's 2006 Counterinsurgency manual noted, "the primary issue motivating fighters in some Baghdad neighborhoods was provision of adequate sewer, water, electricity, and trash services." Moreover, the manual also recognized that when developing effective security forces, funding must be balanced to see that "the central government ensure[s] adequate resources are devoted to meeting such basic needs as health care, clean water, and electricity." The manual stated that public service provision, including electricity, "is a measure of a government's capabilities" (2006).

THOMAS HARTWELL

ABOVE: The Baghdad South power facility, one of many power facilities in poor condition throughout Iraq.

Lack of Electricity as a Source of Grievance and Violence

Much has been written about the instability and animosity that the lack of electricity created in Iraq. According to February 2009 data, full demand for electricity in the country is on the order of 8,500 MW to 9,000 MW, but since the U.S. invasion generation has ranged from a low of 500 MW in May 2003 to a high of 6,055 MW in February 2009 (O'Hanlon and Campbell 2009). In late 2003, the Coalition Provisional Authority (CPA) decided that fixing the power system was a key priority (Chandrasekaran 2006). In February 2004, productivity briefly exceeded nationwide pre-war levels at an estimated 3,958 MW (O'Hanlon and Campbell 2009). However, maintaining enough electricity generation to achieve and expand prewar levels for the entire country proved to be difficult for the CPA. Before the war, Baghdad had 16 to 24 hours of power a day and the rest of Iraq 4 to 8 hours, but during 2006 Baghdad averaged just over 6 hours of electricity a day (O'Hanlon and Campbell 2009). Electricity outages in Baghdad and throughout the country created tensions. According to James Glanz (2006), the reduction in electricity had "an immediate impact on the lives of ordinary Iraqis." In March 2008, the State Department estimated that "on a typical day about 1,500 MW of power, or one-third of the country's peak output, are unavailable because the Electricity Ministry cannot get enough fuel" (Zorpette 2008). Looting, sabotage, and destruction, in addition to aging facilities, were significant contributors to the inadequate provision of electricity.

Energy problems were not just a mere annoyance. In fact, they led to insecurity and even violence. Grievances over the lack of electricity provision sparked two days of deadly riots in Basra in August 2003. An August 6, 2003 United States Government update on Iraq noted that "growing fuel shortages for cars, propane, and kerosene in Al Basrah Governorate and other parts of the lower south are threatening security and some humanitarian operations" (USDOS and USAID

2003). In the country's second-largest city, residents "almost uniformly expressed anger and incredulity at the shortages of gasoline and electricity and the skyrocketing black-market prices that have accompanied them… [a]nd many feared that the remnants of Hussein's government or militant Shiite Muslim groups were prepared to capitalize on the disenchantment" (Shadid 2003). As a spokesman for the British forces in Basra explained, "there's no question in my mind that people's expectations were raised very high and they felt we had led them to expect dramatic improvements when Saddam was toppled" (Shadid 2003). Raising expectations in this situation appeared to have contributed to the level of grievances felt within the populace.

One reason Baghdad residents were so angry was the huge relative loss in electricity after the war. Under Saddam Hussein's regime, electricity provision was used to pacify the populace and retain power. Despite critical problems with the facilities generating the country's energy, Baghdad residents had as much energy as needed (Chandrasekaran 2006). Key supporters and military generals resided in Baghdad, and Hussein wanted to keep happy those individuals who could organize a coup (2006). The CPA, however, decided it should provide the entire country equal access to electricity, thereby reducing the average for Baghdad, albeit improving it for the remainder of the country. This, according to Chandrasekaran (2006), was a "no-win position" as the reduction in power to Baghdad "foster[ed] almost overnight nostalgia for Saddam among people who had cheered his fall."

The lack of electricity continued to fan the flames of animosity, anger, and dissatisfaction among the populace despite improvements over time. Even in 2007, after Brig. Gen. Michael J. Walsh, commanding general of the Gulf Region Division of the Army Corps of Engineers, reported that the United States had finished more than 80 percent of the projects developed to fix the country's energy grid, Walsh observed that residents of Baghdad were not content with the situation (Glanz and Farrell 2007). At a press conference, he told reporters, "I understand people's impatience. Certainly when you flip the light switch and nothing happens, you can get angry" (Glanz and Farrell 2007).

While much in Iraq did change between 2003 and 2008, the frustration with energy provision persisted. According to Glenn Zorpette (2008), the executive editor of *I.E.E.E. Spectrum*, the magazine of the Institute of Electrical and Electronics Engineers, who interviewed people on the streets in Falluja in January 2008, "over and over again, I heard variations on two basic themes: appreciation that the coalition had driven the insurgents out of town, and anger over the inability of their government, with American assistance, to provide them with more than an hour or two of electricity each day. The number of hours may vary, but much the same complaint can be heard just about anywhere in Iraq." Beyond the already poor condition of Iraqi infrastructure and sabotage by the insurgents, failures of governance also played a key role. Zorpette (2008) noted that turf and power feuds between the oil ministry and electricity ministry further undermined electricity provision.

For many Iraqis, the lack of basic services, including electricity, did not motivate violence but caused great anger, animosity, and even a desire for the return of the Saddam era. For a much smaller but not insignificant number of Iraqis, poor service provision may have been a contributing factor in their decisions to join insurgent groups. Heightened and unfulfilled expectations helped push the challenge of restoring power from a serious problem into a severe dilemma that undermined attempts to restore stability, reduced human security, and contributed to violence.

Energy Infrastructure as a Target for Insurgent Groups

According to the National Counterterrorism Center's Worldwide Incidents Tracking System, between January 2, 2004 and September 20, 2008, there were 559 attacks involving energy infrastructure in Iraq (n.d.). Richard Brown (2005) found that "linear installations such as oil pipelines, power lines, highways, and railways were hit most, causing temporary disruptions to supplies and some loss of commercial continuity."

In the *Terrorism Monitor* produced by the Jamestown Foundation, Fadhil Ali identifies five main insurgent groups involved in targeting oil facilities in Iraq. The groups include Al-Qaeda and affiliates; Iraqi insurgent groups; the Ba'ath Party; militias, gangs, and tribes of Southern Iraq; and the Partiya Karkeren Kurdistan (PKK) (Ali 2009). For Al-Qaeda, targeting energy infrastructure would "exhaust America in Iraq today economically and morally" (al-hesbah, December 15, 2004; Al-Quds al-Arabi, December 17, 2004 in Ali 2009). For the homegrown groups, Ali (2009) explains that "the Jihad and Reform Front issued a statement labeling the [2007 Oil and Gas Law] legislation as the new face of the economic occupation. The statement suggested that control of Iraq's oil was America's primary goal (before securing Israel and attacking Islam) following the invasion." For the Ba'athists who had nationalized the oil industry in 1972, supporting elements attacked the oil industry

after the U.S. invasion in response to their belief that the occupying forces were "exploiting and stealing Iraq's oil wealth" (albasra.net, October 26, 2003 in Ali 2009). The groups in Southern Iraq sought to steal oil and fuels for economic reasons (Ali 2009). Although only taking place in Turkey thus far, the PKK, as part of its conflict with Turkey, have targeted the export pipeline between Kirkuk and the Turkish port of Ceyhan (2009).

More broadly, many insurgent groups, who formed for reasons not primarily associated with energy, targeted energy infrastructure to discredit and subvert the U.S. and Iraqi governments' project of establishing a stable post-Saddam regime. Energy was not a singular driver; it was part of the conflict mix. Attacking electricity also brought multiplier effects. The Minister of Electricity, Muhsin Shlash, stated that "when you lose electricity the country is destroyed, nothing works, all industry is down and terrorist activity is increased" (Krugman 2006). In an attack on the British-Iraqi base in Basra in May 2005 by the Mahdi Army, the insurgents' control of electricity was used to surprise coalition forces. According to Cpl. Daniel Jennings of the British military, "the lights in the city were going on and off all over. They were really controlling the whole area, turning the lights on and off at will. They would shut down one area of the city, turn it dark, attack us from there, and then switch off another one and come at us from that direction" (Glanz and Farrell 2007). In a 2007 report, Anthony Cordesman observed that "most key government services affecting Iraq's infrastructure suffered from the insurgency and became another underlying cause of civil violence. The electricity sector, for example, suffer [ed] from lack of security and slow reconstruction."

In fact, the insurgents successfully destroyed significant amounts of energy infrastructure. During the last half of 2006, insurgents nearly shut down the voltage lines running into Baghdad, preventing the city from accessing electricity plants to the north, south, and west (Glanz 2006). Throughout 2006, electricity towers in the country's desert, key to thousands of miles of transmission lines, were frequently hit by attacks. The crews that came to repair the towers and transmission lines also became targets, further calling into question government stability and control. When electricity ministry officials tried to pay locals to protect the lines, their efforts were unsuccessful (Glanz 2006). According to electricity ministry official, Karim Wahid, central ministry officials called local officials and demanded that they flip on switches to direct electricity flows, but when insurgent groups threatened them, the orders were disobeyed (Glanz and Farrell 2007).

In Iraq, the connections between grievances among the populace and violent actions by insurgents became entwined in complex ways. Richard Brown (2005) noted that "the failure by the early planning teams to focus on human security and, in particular, the restoration of livelihoods as a key theme had widespread repercussions. The reconstruction plan did not target areas with poor basic infrastructure, leaving these areas to fester with high unemployment and unfulfilled dreams of receiving even the most basic of essential services in power, water, and sanitation. These areas then became easy recruiting grounds for disaffected youth by rebel groups such as Moqtada al-Sadr's Mehdi Army." Thus, early mistakes with respect to energy provision contributed to grievances, eroded government legitimacy, and fuelled mobilization for the insurgency, but the solution to these problems became extraordinarily difficult as a result of the extreme violence that prevented the restoration of much-needed energy. In Iraq, the linkages between energy security and conflict were well understood by all parties, whether measured by megawatts or in symbolic terms.

Dominican Republic

For more than two decades, the Dominican Republic has suffered through recurring electricity crises.[1] The challenges in the electricity sector are complex and owe as much to social, institutional, and cultural factors as they do to financial and technical variables. The modern Dominican state inherited the electricity sector as a state monopoly from the Rafael Trujillo dictatorship (1930–1961) and took on the role of guaranteeing necessary investments to expand transmission (Oviedo 2004). Electricity problems in the country have been inherently political, with crises in the years from 1996 to 2008 generating popular protests and even violent unrest, threatening at times the political survival of elected officials as well as the economic and political stability of the state.

Four decades of rapid population growth, increasing urbanization, import-led industrialization, and rising expectations among both an emerging middle class and the poor majority are the context in which the Dominican Republic's perennial electricity crisis developed and persisted. For most of this period, and even today, one fundamental problem has been that electricity generation has always lagged behind demand.

The institutional and political framework that defined the electricity sector in the Dominican Republic vastly compounded these problems. President Joaquín Balaguer, in power throughout much of the last

CHRISTINE MATAYA

A view of the tangled web of wires bringing electricity to residents in Santo Domingo, Dominican Republic.

third of the twentieth century, established, in large measure, the politics of electricity sector—a combination of populism, clientelism, and crony capitalism, with a healthy dose of outright corruption. Balaguer provided electricity access for little or no cost in exchange for political loyalty, creating a sense of entitlement among the populace (Oviedo 2004). As consumption grew, but payments remained low, the state was forced to subsidize the sector. Moreover, the Corporación Dominicana de Electricidad (CDE), the state electric company, purposely allowed payment evasion and illegal hook-ups and became a source of jobs for adherents of the party in power. In the 1980s, the government increased electricity access without expanding generation capacity at proportional levels. The CDE's operating objective was to increase access without raising consumer costs or reducing evasion (Oviedo 2004). The legacy of clientelism transferred the burden of costs to the state and the middle class, allowing significant sectors of society to avoid payment, despite increasing population, electricity demand, and high urbanization rates. Beyond the incapacity of large sectors of the population to pay the real cost of electricity, a culture developed that viewed electric power as a public good that the state should provide for free. This has been a key cause of frequent demonstrations and protests.

These social, institutional, economic, and political factors culminated in a drive in the 1990s to modernize and reform the electricity sector. The reform's objective was to restructure the sector in order to create a more competitive market in power generation and to promote investments to improve the system's infrastructure. Despite the privatization efforts that were passed in 2001, financial problems and regular blackouts continued to plague the electricity system, contributing to street protests and political discontent in the years that followed.

Protests over Poor Electricity Provision

Since 2001, public demonstrations over electricity outages and high costs have occurred on a periodic basis throughout the country. These protests have been violent and even deadly. In June 2001, public protests over electricity outages lasting up to 20 hours a day resulted in the death of 6 people, heightening political tensions in the country (Martin 2001). Beyond violent street protests, electricity outages played a role in the 2004 defeat of President Hipólito Mejía. One of the main factors contributing to his defeat was public anger over blackouts. At that time, a banking crisis in the country, coinciding with high oil costs, created delays in government payments to electricity distributors. His successor, President Leonel Fernández, stated that, left unresolved, the electricity crisis had the potential to throw the country into social turmoil.

But, as recently as August 2008, street demonstrations returned. Protests in East and North Santo Domingo, Santiago, and Loma de Cabrera, among other cities, resulted in injuries, multiple arrests, and the destruction of property (DR1 2008). Riots and protests in November 2008 were particularly severe. During that month, parts of the country were facing blackouts lasting as long as 20 hours a day, and at least 14 power plants were not functioning, making energy output the lowest in years (*Dominican Today* 2008b). Dominicans received less than half of the 1,960 MW the country demands, which the power companies blamed, in part, on the unaffordable price of petroleum required to generate electricity (*Dominican Today* 2008d). Demonstrators in a northeast municipality destroyed two 69,000-volt power line towers, set fire to the energy distributor Edenorte's office, and shattered windows of businesses and a police station (*Dominican Today*

2008a). These actions left almost the entire northeast region without power, which was already experiencing up to 24-hour blackouts (*Dominican Today* 2008a). During these demonstrations, at least one person died and dozens were injured (*Dominican Today* 2008d).

On March 26, 2009, 2 people were injured and 25 arrested after protests in 4 towns across the north of the country (*Latin American Herald Tribune* 2009). Electricity shortages, in combination with concerns over poor infrastructure and high food prices, sparked demonstrations that resulted in clashes between police and demonstrators. Reports stated that protesting youth fired on police, set fire to tires, barred movement along streets, and released homemade bombs (*Latin American Herald Tribune* 2009).

The Political Economy of Reform

Electricity problems are a drag on Dominican economic development, but the reforms needed to make the transition to a more efficient system of regulation and distribution are politically very difficult. While "rationalizing" the sector would in principle result in higher levels of production in the long term, the short-term distribution of winners and losers could spark conflict. In January 2009, the government announced that it planned to end the monthly electrical subsidy, providing support to only the poorest people unable to pay for electricity (*Dominican Today* 2009a). The government subsidizes electricity for families in 150 neighborhoods in the amount of US$160 million per year (*Dominican Today* 2009a). While the most impoverished will still receive the subsidy, those removed from the program are likely to have problems paying. The absence of a social safety net for those who are among the poor (but not among the subsidized very poor) is part of the basic challenge of rationalizing prices in the electricity sector. With grievance levels already high, the phase-out is likely to rekindle anger. A law passed in 2007 that allows imprisonment for electricity fraud took effect in late February 2009 (*Dominican Today* 2009b), which is likely to contribute further to public resentment against the government and electricity distributors.

For the private sector, electricity shortages are a significant drain. In the electricity sector itself, financial losses are severe. While electricity is in short supply, the rate of access is high. According to the 2007 Human Development Report, the Dominican Republic's electrification rate between 2000 and 2005 was 93 percent (UNDP 2007). However, as poor service in the form of shortages and blackouts occurs, people are even less inclined to pay their electricity bills (Oviedo 2004). The World Bank found that 2005 electricity distribution losses totaled 38.2 percent, putting the country in third-to-last place for electricity losses worldwide (USDOS 2008). In fact, approximately 35 percent of electricity users do not receive bills by the distributing companies, and financial losses for electricity distributors rose by 20 percent in the first 5 months of 2008 (DR1 2008).

The problems of the electricity sector ramify throughout the economy. According to Pedro Pérez of the National Organization of Shopping Malls, "the impact of the blackouts on the operational costs of companies is very high, because one has to maintain a self-generation system, not an emergency system as originally designed, and more so with the high cost of fuel today" (DR1 2008). In August 2008, Fitch Ratings stated that the electricity "sector [was] teetering on the brink of financial distress" (Reuters 2008a). In November 2008, a representative of the country's National Business Council (CONEP) stated that "with an electrical sector structured such as ours, [it] is impossible to develop our country. The electrical sector has become a cancer that consumes our gross domestic product and prevents us as a nation from developing new formulas for development" (*Dominican Today* 2008c).

Unfortunately, the Dominican government continues to face the fundamental conundrum of improving service for consumers by simultaneously improving revenue collection, ending subsidies, and eliminating illegal connections—all of which find resistance from a population used to receiving electricity as a quasi-public good. These inherent contradictions have led to conflict and violence in the past, and are likely to continue to do so for the foreseeable future.

Ukraine

During the last few years, Ukraine and Russia have had a series of disputes related to natural gas, with ramifications that have led to disruptions of natural gas delivery to Eastern and Western Europe as well. Approximately 80 percent of the gas Russia ships to Europe passes through pipelines crossing Ukraine, which is centrally located between Russia and the Caspian Sea to the east and European markets to the west (Pifer 2009). As a result of Russia's reliance on Ukrainian infrastructure, it has provided Ukraine with portions of the natural gas shipped through the pipelines to Europe as in-kind payment for use. In the last few decades, Europe's reliance on natural gas has grown, increasing the importance of Ukrainian infrastructure to Russian revenue generation (Mankoff 2009). Thus, the revenue that Russia realizes

from European energy sales makes it dependent on Ukraine, while Ukrainian consumption of natural gas makes it dependent on Russian supplies.

Linked to the infrastructure situation are two additional elements. The dispute between Russia and Ukraine includes a disagreement regarding the price that Ukraine pays and unpaid debt Ukraine owes for previous gas purchases (Mankoff 2009). On average, Ukraine imports 50 billion to 55 billion cubic meters (BCMs) of natural gas from Russia under what Steven Pifer (2009) describes as "opaque arrangements that many analysts believe to be corrupt." The price Ukraine paid Russia in 2008 was US$179.50 per thousand cubic meters (Pifer 2009). Europe's rate is closer to US$400 per thousand cubic meters. Ukraine also is in arrears to Russia for previous gas shipments. However, how the debts have been accrued and which Russian energy company should be paid by which Ukrainian energy company is extremely murky. The "opaque and unaccountable intermediary arrangement" between Russia's Gazprom and Ukraine's Naftohaz is, in large part, to blame (Closson and Perovic 2009).

A third and perhaps deeper factor causing tensions between Ukraine and Russia is Ukraine's increasing alignment with Western Europe. With the election of President Viktor Yushchenko in 2005, and the perception in Moscow that he was leading an anti-Russian government, animosity between the two governments spiked (Mankoff 2009). Andrew Kramer (2009b) notes that "political experts say that neither side is motivated to settle the [gas] dispute, because it has never been about the stated issues. Instead, it has been a proxy for far more fundamental and insoluble matters, particularly Ukraine's 2004 turn to the West in the 'Orange Revolution,' which deeply shook Russia's nationalists." In a February 2009 article in *EurActiv*, Fraser Cameron, director of the Brussels-based EU-Russia Centre, said that "there is no question that Russia wants to have these countries [Ukraine, Georgia, and Latvia] under its influence. But its means to do that are limited essentially to the energy weapon." Mankoff (2009) argues that to counter Ukraine's European tendencies, the Russian government has used the recent gas crises as means to seize control of Ukraine's pipeline infrastructure and the operating companies.

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ABOVE: Natural gas pump station. Kiev, Ukraine.

A further complicating factor is the close relationship between some of the country's leading politicians and high-level stakeholders in the country's energy sector, which has led to allegations of corruption and lack of accountability. For example, Keith Smith (2004) alleged just a few years ago that "[t]he three wealthiest and most politically influential people—[former] President Kuchma; his son-in-law, Viktor Pinchuk; and the head of Naftohaz Ukrayiny, Yori Boyko—are all connected to the energy industry." Close ties continue into more recent Ukrainian administrations. Andrew Kramer (2009a) of the *New York Times* notes that RosUkrEnergo, "a gas trading company that is the exclusive intermediary for gas shipments to Ukraine," is owned by Gazprom and a Ukrainian man who has a close relationship with former president Viktor Yushchenko. Before becoming a politician, Prime Minister Yulia V. Tymoshenko was a key player in the country's energy sector and was known as the "gas princess" due to controversial actions she undertook as president of United Energy Systems of Ukraine.

The present system for the sale and transfer of natural gas, however flawed, is not likely to fundamentally change overnight. Stacy Clossin and Jeronim Perovic (2009) assert that "[t]he opacity of cash transactions has allowed vested interests in [Russia's and Ukraine's] energy sectors to benefit, preventing the

resolution of ongoing issues. For example, the stakeholders in Naftohaz use their positions to generate personal wealth through the use of UkrGazEnergo for industrial sales of gas on the Ukrainian market." There is also speculation that the lack of transparency allows Russia to provide financing to influence Ukrainian political organizations and politicians (Clossin and Perovic 2009).

It is in this context that Russia and Ukraine have battled over gas prices and shipments in recent years. Crises in 2006 and 2009 have been the most controversial and serious. During the January 2006 round, the two countries were unable to compromise on a price for gas shipments, so Ukraine stopped payment and Russia stopped deliveries. However, since Europe-destined gas had to transit through Ukraine, the Ukrainians were able to take some of the supply meant for Europe. As a result, with enough gas for their own generation needs, Ukrainians suffered little (Mankoff 2009). Europe, instead, bore the brunt of Russia's temporary shutdown in gas supply, with shortages occurring throughout the region. Fortunately, the two countries came to a relatively quick solution, which basically held until January 2009.

The 2009 crisis was much more difficult, especially for Europe. After several months of heated political arguments, Russia turned off the gas to Ukraine on January 7, 2009, accusing Ukraine of siphoning gas after negotiations on increasing payments to Russia collapsed (Pifer 2009). Much of Europe lacked heat for several days in the midst of extremely cold winter weather. After three weeks of bickering, Russia and Ukraine finally came to a 10-year agreement, and the flow of gas resumed. Ukraine's 2008 payment of US$179 per thousand cubic meters is to increase to between US$208 and US$240 per thousand cubic meters (Kramer 2009b). The consequences of this eventual price hike on the Ukrainian economy are yet to be seen, although industry is the largest consumer of gas and likely will be hurt most. Historically, residential gas prices have been subsidized by industry (Korduban 2008). But with a burgeoning economic crisis underway marked by increasing unemployment, inflation, currency collapse, and declining GDP, subsidized prices may not last. In fact, it is the overall economic crisis that "many analysts fear could cause social unrest, opening the door to possible meddling by Russia, and potentially destabilizing a strategically important country" (Whitmore 2009).

Ukraine's underground reserves and the likelihood of European intervention to prevent another serious shortage of natural gas limit the potential for outbreaks of conflict related to energy problems. According to Volodymyr Yermolenko (2009), as Ukraine has one of the largest storage systems in Europe, "the underground depositories enabled Ukraine to survive more than 20 days of a gas embargo after Russia cut gas supplies to Kiev on 1 January [2009]." Niall Green (2009) agrees that "Ukraine is relatively well placed to weather a continuation of the Russian gas cut-off, having built-up large reserves of natural gas in the two years since Moscow last halted supply in a dispute over prices."

If Ukraine's energy problems do at some point contribute to instability in the country, it is likely to be as an aggravating factor in the context of what is already a conflictive political environment. According to Tomas Valasek of the London-based Centre for European Reform and Amanda

"...it appears that the real sources of instability and conflict in Ukraine lie in the political and economic spheres, with the energy sector a potential trigger or amplifier of conflict under certain circumstances."

BBC NEWS 2009.

ABOVE: The network of gas pipelines running from Russia, through Ukraine, and into Europe. The darkly shaded countries have been severely affected by disruptions in gas deliveries.

Akcakoca of the European Policy Centre, the key internal problems facing the country include political in-fighting, corruption, and governance failures (*EurActiv*2009). During the 2006 energy crisis, public support for President Viktor Yushchenko's government was damaged. Objecting to the government's agreement with Russia, parliament passed a no-confidence vote (Nichol et al. 2006). At that time, Yushchenko disregarded the parliament's actions and there was minimal political fallout (Nichol et al. 2006). The current situation, however, is quite different. In fact, it is the "endless bickering between President Viktor Yushchenko and Prime Minister Yulia Tymoshenko, allies in the pro-Western Orange Revolution just four years ago, [that] is tearing the elite apart and handcuffing anticrisis efforts as the government seeks foreign assistance to ward off economic catastrophe" (Whitmore 2009).

Despite the new 10-year agreement between Ukraine and Russia, some analysts fear that the underlying problems have not been resolved. The 2009 agreement is flawed in two critical areas. First, the Ukrainian gas company Naftogaz "has absolutely no incentive to buy expensive gas in May-June and inject it into underground storage facilities, because the price in November-December will be much lower" (Korchemkin 2009). Since Gazprom's pipelines cannot provide enough gas in the winter to meet the demand from Ukraine and the rest of Europe, Ukraine will have to withdraw some of its underground reserves. If underground supplies run low in Ukraine due to summer use, availability in the winter may be compromised. Second, World Trade Organization requirements may prevent Naftogaz from charging Gazprom below-cost transit services—at present "Naftogaz sells transit services to Gazprom at dumping price" (Korchemkin 2009). Hence, issues related to energy provision remain that may cause disagreements and tension between the two countries once again. Nevertheless, it appears that the real sources of instability and conflict in Ukraine lie in the political and economic spheres, with the energy sector a potential trigger or amplifier of conflict under certain circumstances.

Effects Beyond Ukraine

During the January 2009 crisis, Central and Eastern Europe bore the brunt of the shutdown of gas from Russia to Ukraine. Latvia, Slovakia, Finland, and Estonia are 100 percent reliant on Russian gas, and Bulgaria, Lithuania, and the Czech Republic are more than 80 percent reliant on Russian gas (BBC News 2009b). Even back in 2006, the much shorter shutdown "stoked European fears of being too dependent on Russia for natural gas" (CIAO 2006). In 2009, people in Bulgaria, Bosnia-Herzegovina, the Czech Republic, Hungary, and Serbia had to cope with the suspension of gas during a particularly cold period.

In Bulgaria, without the heat that natural gas provided, schools and hospitals closed, industries ceased operations, local businesses could not open, and street lighting was drastically reduced. Despite similar problems in the past, Bulgaria had no reserves and was ill-prepared for the disruption. One resident of Sofia interviewed by the *BBC* stated that "people are truly worried, but there is also a great deal of anger" (BBC News 2009a). Bulgaria was not only one of the worst-affected countries; it also faced some of the most significant political ramifications (Shore 2009). In addition to the forced closure of public buildings, allegations surfaced that the

government had been warned in advance by the Russians of possible disruption, but instead of finding alternative sources after the events of 2006, the government apparently had done nothing (Shore 2009).

The Serbian government was forced to obtain emergency natural gas supplies after several days of gas disruptions in January 2009 (Radio Free Europe/Radio Library [RFE/RL] 2009b). President Boris Tadic was criticized widely for his handling of the crisis, with critics accusing him of capitalizing on the arrival of emergency gas supplies for political gain (2009b). In Bosnia-Herzegovina, the lack of natural gas for heating created problems for residents of Sarajevo, instigating the "worst humanitarian crisis since the 1992-95 war," according to Radio Free Europe/Radio Liberty (RFE/RL 2009a). Sarajevo's 70,000 households, as well as those in several other cities in the country, rely totally on natural gas for heating (2009a). If the 2006 crisis did not do it, the 2009 fiasco demonstrated the energy vulnerability and insecurity of parts of Central and Eastern Europe.

TRADITIONAL BIOMASS

Energy insecurity is radically different in much of the developing world. Over two billion people depend for much of their energy on traditional biomass, including wood, charcoal, and other lower quality combustibles such as straw and dung. Poor populations in Africa and Asia, in particular, are reliant on these materials for cooking, heating, and other household energy needs. According to the United Nations Food and Agricultural Organization (FAO) (2008a), although traditional biomass provides only 10 percent of the world's energy as a whole, these fuels account for as much as 80 percent of the energy use of some subregions of Africa. In 2000, wood production totaled approximately 3,900 million cubic meters, of which 2,300 million cubic meters, or approximately 60 percent, was used for fuelwood (FAO 2008a). This trend is likely to continue for the foreseeable future. In its 2007 State of the World's Forests report, the FAO predicts that fuelwood will remain the predominant energy source in the developing world because high oil and gas prices will make those fuels too costly for most households. FAO (2007) notes that concerns over carbon emissions may limit fossil fuel burning by governments, which will limit electricity production, further ensuring reliance on traditional biomass. These factors also must be viewed against a backdrop of high population growth, which will increase demand for energy in the coming decades.

Traditional biomass is advantageous in developing country settings because compared to oil, natural gas, and other modern energy sources, biomass is readily available, inexpensive, and not subject to fluctuations in the global market. However, the long-term sustainability of biomass has been questioned. As far back as 30 years ago, the United Nations Food and Agricultural Organization (FAO) was raising alarms at the increasing consumption of wood energy and calculated that fuelwood shortages and deforestation were likely to worsen in the near term (*Ambio* 1979). In 1985, O'Keefe and Raskin (1985) predicted that Kenya would face a national fuelwood shortage by 1990. The terms "fuelwood gap" and "woodfuel gap" were coined and warnings were issued that, if trends continued, some developing countries would be completely deforested within several decades (Center for International Forestry Research 2003; Matthews 2001). Declining human security was implicit in this context, and predictions were made about negative effects on livelihoods, food security, nutritional status, education, health, and poverty reduction (FAO n.d.).

However, perspectives are changing somewhat. Although deforestation has continued, there is increasing acceptance of the view that the need for household energy is not the primary driver of deforestation and environmental degradation (Arnold et al. 2003). New research has tempered concerns about impending fuelwood gaps by highlighting the role of non-forest wood resources. At the level of household fuelwood collection, the responsibility for obtaining biomass mostly falls to women. Women seek to maximize collection and minimize time spent, which tends to mean that biomass is collected from fallen trees and land cleared for agriculture rather than cutting new trees, which is much more labor-intensive and time consuming (Mahiri and Howorth 2001). In areas where space permits, households with secure land tenure also may plant trees in an attempt to ensure continued access to firewood (Mahiri and Howorth 2001; Arnold et al. 2003). This contradicts former assumptions that standing trees were the primary source of biomass. It is worth noting however, that data at all levels is lacking. When it is available, it often is based on household consumption and expenditure surveys, which can be based on incorrect assumptions (Arnold et al. 2003). Nevertheless, there is a growing view in the literature that household collection and use of biomass is not resulting in massive deforestation of the developing world.

Biomass produced for sale in urban areas is associated with less

sustainable harvesting patterns and worsening environmental conditions. Unlike rural biomass use, which typically means firewood, energy use in developing cities is based on charcoal (FAO 2008b; Arnold et al. 2003). Although charcoal burns more efficiently than wood, it also is much more resource-intensive to produce. In Kenya, for example, traditional methods yield only 1 kg of charcoal for every 8 kg of firewood burned (Kammen 2006). Researchers are now voicing concerns about the effect on standing forests because charcoal is produced from newly felled trees (FAO 2008b). Unlike fuelwood use, which some think has reached a global peak (Arnold et al. 2003), demand for charcoal has increased steadily over the past decades.[2] According to Arnold et al. (2003), charcoal use doubled between 1975 and 2000. As urban populations grow in the coming decades, charcoal demand is likely to increase further, with the FAO predicting that charcoal consumption will increase by 111 percent in the developing world during the period from 2000 to 2030 (FAO 2008b).

The degree to which energy insecurity related to biomass plays a role in contributing to or intensifying conflict in the developing world depends heavily on specific circumstances, including cultural practices, demographic patterns, environmental management, governance capacity, and economic and political considerations. In general, it appears that household and community-level collection of biomass is not likely to lead to large-scale conflict in the countryside. Despite concerns that population growth and deforestation could limit access to biomass, possibly leading to increasing competition or conflict over scarce resources, energy insecurity is generally not likely to be a major source of conflict among the rural poor.

However, in cases where forestry resources are harvested as an income-generating strategy, energy has played a role in perpetuating instability. When biomass resources are removed from the context of household collection and enter the realm of market forces, conflict becomes more likely. Examples from Chad, Democratic Republic of the Congo (DRC), and Somalia show that the combination of high demand for biomass and weak, ineffective governance can lead to outcomes with the potential to add to instability.

Chad

In settings where urban populations are largely reliant on biomass, threats to energy access are likely to constitute a serious threat to human security as a whole. This was demonstrated in Chad in December 2008 and January 2009. Following concerns about environmental degradation and deforestation surrounding the capital, N'Djamena, the government began enforcing a total ban on charcoal and wood products entering the city (IRIN 2009). In explaining the policy, the government cited impending desertification and noted that 60 percent of the country's forests have been lost as a result of tree felling for charcoal (Hicks 2009). The ban had an immediate impact in the capital. City residents were faced with fourfold price increases for the small amount of charcoal that was still available. Many households were forced to either curtail energy use or scavenge for low-quality materials such as dung on the outskirts of the city. Some families began burning furniture and even the beams of homes in order to cook (Hicks 2009).

The government has insisted that households should adapt their energy usage and switch from charcoal to propane (Hicks 2009). However, at the time of the ban, propane was too scarce and costly for most families, leaving them without fuel for cooking and other household necessities. Although the government acknowledged that instituting the ban without ensuring access to viable alternatives was a "gaffe," it refused to change course on the policy (AllAfrica 2009). Angry women protested the decision and were met with force from the government. News outlets reported violence against those gathered, and subsequent planned demonstrations were not allowed to take place (IRIN 2009).

Since the ban was imposed, the situation has continued to deteriorate. Reports indicate that the charcoal ban is still being enforced with serious consequences for the poorest residents of N'Djamena (de Bruijn 2009; Fort 2009). Chadian authorities have burned buses attempting to carry charcoal into the city, leaving vendors without income. One charcoal trader reported that the industry has lost US$11.7 million since the ban took effect (Fort 2009). To cushion the impact at the household level, the government began subsidizing 50 percent of the cost of propane. However, much of the population is still unable to afford the fuel and is left without energy for their households (Fort 2009).

The pressures facing families in N'Djamena are likely to increase if the ban continues. However, the government retains tight control of the political space in the country, as the prior crackdown on protesters showed. In combination with other tensions, including rebel groups in the countryside and refugee flows from the Darfur conflict, the already weak government may face a further loss of legitimacy as citizens struggle for livelihood security in increasingly difficult circumstances.

Democratic Republic of the Congo (DRC)

In the Democratic Republic of the Congo, a country already plagued by violent internal conflict and lawlessness, population growth and the resulting pressure on land are contributing to an unsustainable and illegal reliance on charcoal. As described in a recent Institute for Environmental Security report assessing environmental security threats in the Central Albertine Rift area of the DRC, "the combination of a high and rising population density, the strong reliance on resources and the enormous need for energy in the form of firewood and charcoal, all lead to a very high pressure on the natural resources in this region" (van de Giessen 2008). The report also links the actions of rebel groups, the army, and artisanal miners to unsustainable pressures on land and fuelwood, leading to a burgeoning and prosperous charcoal industry (2008). The charcoal industry is contributing to rapid environmental change and exacerbating vulnerability in this already insecure and unstable region.

The DRC is highly dependent on wood energy, which provides 80 percent of all energy consumed in the domestic sector (Forests Monitor 2007). The city of Goma, with a domestic electrification rate of less than 10 percent, is particularly dependent on wood energy (Forests Monitor 2006). Goma is host to a large number of internally displaced persons (IDPs) who have fled fighting in their home villages. In a recent count, approximately 23 percent of the town's population were IDPs (2006). According to the Congo Basin Forest Partnership (CBFP), the city of Goma alone consumes more than 47,000 tons of charcoal per year, representing 250,000 tons of wood (CBFP 2006). CBFP (2006) estimates that 90 percent of the city's wood supply comes from Virunga National Park, the oldest national park in Africa, a World Heritage site, and home to endangered and endemic flora and fauna, including the mountain gorilla. A total of 3 million people within a day's walk of the park rely on charcoal as their primary energy source (Crawford and Bernstein 2008).

The high demand for charcoal has created a profitable, but illicit, market for traders who are illegally felling trees from the national park at unsustainable rates. According to a 2008 update from Wildlife Direct, an organization chaired by paleontologist Dr. Richard Leakey that tracks the illegal charcoal trade, the Congolese Institute for the Conservation of Nature (ICCN) confiscated 10 trucks with more than 36 tons of illegal charcoal during the month of January 2008 alone (Wildlife Direct 2008). To meet the demand, organized groups of charcoal merchants, many of whom have engaged in violence, have cleared large tracts of forests in Virunga National Park. The trade, which amounts to an estimated US$30 million per year has resulted in serious environmental degradation and eliminated critical habitat for endangered species such as the mountain gorilla (Johnson 2007). MercyCorps estimates that under current rates, the southern part of Virunga National Park will be completely deforested in 10 years (Hazard 2008).

Park rangers charged with protecting the forest have come into conflict with the charcoal merchants. The beating of park ranger Paulin Ngobobo drew the attention of *Newsweek* (Johnson 2007), MercyCorps (Hazard 2008), and the Institute for Environmental Security (van de Giessen (2008), among others. Wildlife Direct also documents periodic beatings and the ongoing challenges that ICCN rangers face in seizing illegal charcoal and protecting the ban on illicit tree felling from the park.

In addition to the lucrative illegal charcoal trade, IDP camps have been a significant burden on the park. With few alternatives for cooking and heating, refugees in the camps are heavily dependent on charcoal and wood energy, increasing the strains on nearby forests. According to a 2007 UNEP report, "the key threat to the [Virunga National] park from the IDPs stems from the use of firewood and charcoal for cooking needs," which WWF estimated at 600 tons of firewood per week for the 4 nearby camps. Concerned with the consequences for the park, WWF and CARE began implementing projects to find alternative sources of wood and provide improved cooking stoves for the camps.

The charcoal trade in the DRC is partly a by-product of the ongoing conflict in the DRC and the resulting lack of effective national and local governance and enforcement capacity. Both the national army and rebel leader Laurent Nkunda have been linked to the charcoal trade. According to data from Amis de la Forêt et de l'Environnement pour le Développement, the most important market is located west of Virunga National Park and was established by Nkunda in 2004. A second market, also to the west of the park, is dominated by the wives of military personnel. Within a 10-kilometer radius of Goma, there are more than 300 ovens used for charcoal making (Forests Monitor 2006). UNEP reported in 2007 that the Forces Armées de la République Démocratique du Congo (FARDC) and armed rebel groups participated in and profited from illegal exploitation of natural resources from national parks, including charcoal (UNEP 2007). A 2008 case study covering Virunga National Park by the International Institute for

Sustainable Development (IISD) describes how the lucrative charcoal trade has attracted various fighting factions, which have carved up the park in the following manner: "the Hutu-dominated FDLR, responsible for Rwanda's genocide, control production around Nyamulagira and Nyiragongo volcanoes in the west of the sector; the Congolese army frequently uses government trucks to smuggle charcoal out of the park; while Tutsi-backed Laurent Nkunda has controlled Mikeno Sector and its production since September 2007" (Crawford and Bernstein 2008). While international attention to the charcoal trade and its attendant consequences are growing, there are no immediate or simple solutions to ending the illegal charcoal trade or addressing the growing energy demands of the population.

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ABOVE: Charcoal for sale in Africa.

Somalia

In Somalia, the absence of central authority has resulted in a near-total lack of control over natural resources. Traditional resource management and dispute resolution mechanisms also have broken down, creating an opening for new groups to cut large swaths of the region's remaining acacia forests in order to make charcoal for export to Saudi Arabia and other Gulf countries (CHF International 2006; Bakonyi and Abdullahi 2006). The impact on the environment has been severe. Pastureland reportedly has become more arid, and water resources have become more scarce (Bakonyi and Abdullah 2006). Increasing desertification will likely follow (American University n.d.).

Statistics on the number of people affected are not available. However, reports indicate that the situation has spurred conflict between charcoal traders and local communities who rely on environmental resources but do not benefit from the charcoal trade (CHF International 2006). Conflict also has occurred between clans vying for control of the charcoal trade (American University n.d.). Several clans have attempted to address these tensions by regulating or banning charcoal production but thus far have been unable to do so.

This conflict is not being driven by local demand for fuelwood but rather by demand in the Gulf region. In countries with effective governance, exports of natural resources can be controlled and the benefits distributed among the population. In Somalia, the total lack of central authority and legitimate governance has allowed the predatory extraction of natural resources to take place, with negative effects being borne by groups that already are living at the margins. The effects of this unregulated charcoal trade are likely to exacerbate already existing tensions in the region.

The cases of Chad, DRC, and Somalia suggest that linkages between biomass dependence and conflict are strongest in situations where uncontrolled, illicit, or monopoly markets drive natural resource depletion. In the context of absent or ineffective governments, traders are able to exploit resources without constraints or regard for sustainability. From these distorted market conditions, there arises a variety of catalysts for conflict, including price inflation, intense competition among users, and sudden shifts toward conditions of scarcity.

HYDROPOWER AND DAMS

One of the clearest historical linkages between energy security and conflict is found in the controversies and unrest related to hydropower and the building of dams. While local complexities are still highly important, the discontent and tensions created by dams are fairly similar across regions. Governments build large dams to increase much-needed energy production, either to meet the needs of business and industry, extend electrification, or for export, and they often find

themselves at odds with citizens fearing for their land, livelihoods, and ways of life. These projects often have profound environmental, economic, and social impacts. The aggrieved communities mobilize around issues that range from displacement and compensation to alternative livelihoods, and with the help of a growing anti-dam activist network, many communities have fought vigorously against dam projects. Conflict is not inevitable, but in countries with low levels of transparency and authoritarian governments, communities have been subjected to violence, intimidation, and other human rights violations.

Over the past three decades, critics have publicized the various ways in which large-scale dams can affect negatively local populations and the environment. The greatest challenge for many communities is the loss of homes and livelihoods that occurs when their former lands are flooded. Given the lengthy delay between project announcements, feasibility studies, construction, and final operation, affected groups can suffer from years of underdevelopment even before they are displaced. Donors, NGOs, governments, businesses, and communities themselves are reluctant to invest in areas that are slated for flooding (World Commission on Dams 2000). According to the World Commission on Dams, which studied dozens of cases of dam building from across the globe, the construction period puts additional pressure on already vulnerable groups by exposing them to threats such as disease and loss of group identity.

Tens of millions of people have been displaced due to large dam projects since 1950. The range of issues that are associated with displacement includes loss of farmland, homesteads, and other physical property, problems with resettlement and compensation, and political marginalization. Despite recent advances in mainstreaming the rights of affected groups into project planning, poor and marginalized groups still may find themselves left out of the process. Compensation remains contentious because cash payments may not cover the full cost of lost resources, which are difficult to estimate. Some communities have been relocated to marginal and environmentally degraded land, with dramatic declines reported in food production, health, and other human security indicators (World Commission on Dams 2000).

Numerous early dam projects also were characterized by forced displacement and violence. In the early 1980s, hundreds of people were killed in Guatemala when they refused to leave their homes before compensation packages had been negotiated (Johnston 2005). These kinds of incidents have diminished in number, but discord and disputes continue. Murders and other forms of violence have been associated with the La Parota dam project on the Papagayo River in Mexico. In 2006, International Rivers reported police attacks there against peaceful demonstrators that wounded hundreds (Aguirre 2006). Three local activists died, allegedly killed as a result of tensions within their communities regarding dam construction (Amnesty International 2007b). In India, community resistance to the controversial Sardar Sarova dam was met with police brutality, including reported attacks on peaceful crowds and beatings of demonstrators (Vartak 2001; Independent Media Center India 2001). The cases of Sudan and Cambodia below offer two additional

The Role of the Anti-Dam Movement in Mobilization

In recent years, political scientists and students of social change have turned their attention to the importance of international networks in local mobilizations (Keck and Sikkink 1998; Florini 2000). One of the most frequently cited examples of this phenomenon is the anti-dam movement (Rothman and Oliver n.d.). This worldwide network of activists has played an instrumental role in shaping the dialogue surrounding large hydropower schemes by highlighting issues of environmental justice, economic compensation, displacement, and violence (Raghunandan 2003).[3] This movement, which began in India but has since been active in countries all over the world, has created models of action to resist problematic large-scale dam projects. In cases where projects have gone forward, campaigners have worked to provide affected communities information and a platform to voice their objections. Although sometimes criticized for engaging in exaggeration and hyperbole or even contributing to conflict, the anti-dam movement has had considerable influence. The pace of dam-building slowed after 2000, environmental and social impact assessments are standard practice (albeit often pro forma), compensation packages have improved, and resettlement arrangements receive more attention. As activist organizations have gained more sophistication and expertise, the anti-dam movement has forced major funders such as the World Bank and regional development banks to consider these issues more seriously prior to committing funds to a project. With the pace of hydropower construction expected to increase in the next decade, the anti-dam movement—or dam skeptics—may again play an important role in promoting public debate and encouraging community organization.

cases of actual and potential conflict and violence.

Sudan

The Government of Sudan is planning an ambitious set of dams on the Nile River in the country's northern region of Nubia to generate hydropower, which it believes will aid development and move people out of poverty (Boulding 2008). The Merowe dam, which is being funded by a portfolio of Chinese and Arab donors, is expected to cost approximately US$2 billion and generate 1,250 MW of power, approximately half of the country's installed capacity (Muindi 2002). The Kajbar dam is expected to provide 200 MW of power. The Chinese government is financing 75 percent of the Kajbar project funds, with the Sudanese government providing the remaining 25 percent (International Water Power and Dam Construction 2004). Both the Merowe and Kajbar dams have had, and will continue to have, substantial impacts on the communities living in the flood plains. An estimated 50,000 to 70,000 people will be displaced by the Merowe dam alone (International Rivers 2009a; Sanders 2007). Although the Kajbar dam is not as large as the Merowe dam, the area designated for flooding is more densely populated and as many as 100 villages could be impacted (RN Afrique 2007).

A confluence of factors has generated major unrest among affected communities, including ethnic tensions, poor governance, and a lack of accountability in financing. Local groups have emphasized the huge impact that the dams will have on residents and drawn attention to human rights violations that they claim to have suffered, including killings, arrests, forced displacement, and the denial of freedom of speech and association. Both the government of Sudan and its financial backers have come under criticism for a lack of regard for those affected by the dams, which has led to increased anger and resentment in local communities. Several groups have mobilized to resist the dams. As the tensions escalate, so too do fears that the region will experience broader unrest.

INTERNATIONAL RIVERS

ABOVE: A home flooded by the Merowe dam project.

Much of the recent controversy and conflict surrounding the Merowe dam has resulted from dissatisfaction with resettlement plans. For some communities, proposed resettlement packages require them to move from fertile lands near the Nile River to arid desert locations (Reuters 2008b). Communities, in turn, have tried to resist displacement. In several instances, the government has reportedly responded with violence or the release of water to fill reservoirs and flood surrounding areas. In 2006, Merowe dam militia allegedly attacked villagers gathered at a school who had previously organized against displacement (International Rivers 2006). Witnesses reported the use of heavy artillery and machine guns resulting in the death of 3 and the wounding of 50 (International Rivers 2006). Between 15,000 and 16,000 people were forced to flee their homes in July and August of 2008 when the government closed Merowe dam gates and flooded an area upstream of the dam. Water levels were again increased in September 2008, displacing another 3,000 families for a total of more than 30,000 people forcibly displaced (International Rivers 2008a).

Conflict also recently erupted in northern Sudan over the construction of the Kajbar Dam. People living in the area have complained that they were not consulted about the project during the design phase and were given no information about the status of the construction. RN Afrique (2007) reports that when construction began on the Kajbar dam communities were not notified that the project was moving forward, and they awoke to Chinese construction workers moving materials into the area. The community group organized to resist the dam, Rescue Nubia, planned several demonstrations against proposed

dam activities in April 2007 demanding a cessation of construction (RN Afrique 2007). A series of protests became increasingly tense and the confrontations escalated. The most serious incident occurred in June 2007, when government forces killed four people and wounded dozens more (Sanders 2007). Accounts by Rescue Nubia (2008) place the number of killed even higher at seven. According to Rescue Nubia (2008), government security forces used tear gas against the demonstrators before opening fire on the crowd. At the same time, the government arrested dozens of journalists and other local leaders (Sanders 2007; Amnesty International 2007a).

In August 2007, the United Nations Special Rapporteur on adequate housing, Miloon Kothari, issued a statement calling on the government of Sudan to discontinue work on the Merowe and Kajbar dams until the outstanding issues with area citizens were resolved (United Nations 2007). In his report, Kothari reiterated the necessity of following international standards when constructing dams and raised concerns about human rights, noting the reports of killings and arrests of those opposing the dams and resettlement plans. Other groups, both local and international, have expressed concern over the escalation of conflict. The Sudan Human Rights Organization (2007) highlighted the political detentions and intimidation of protest organizers, and Amnesty International (2007a) issued statements and action alerts, particularly pertaining to the detention of journalists and activists.

The types of conflict manifested at the Merowe and Kajbar dams are not unique. In many ways, the complaints that have motivated Nubians to mobilize (resettlement, compensation, and the suppression of local community objections) are similar to those expressed by communities opposed to dams all over the world. However, these cases also highlight the importance of local specificities. The mobilization of Nubian communities around these issues results, at least in part, from pre-existing feelings of marginalization and persecution. Nubians are angry not just about the impact that the dams will have on their land and livelihoods, but also at what they view as longstanding patterns of economic and social exclusion (RN Afrique 2007). Nubian residents are of African descent, putting them at odds with the Arab-dominated government in Khartoum. The group has lived in northern Sudan for thousands of years, and has a unique culture and language that they feel is threatened by the Merowe and Kajbar dams. Some group leaders have expressed suspicions that the government is targeting the area for flooding in order to destroy their culture and livelihoods (Rescue Nubia 2008; RN Afrique 2007; Sanders 2007).

As feelings of persecution have intensified and conflict has escalated, the stakes have been raised. Initially, the response of local communities was aimed at opposing the dams. However, as the government began using force against citizens, the newly formed Kush Liberation Front began using the issue as a rallying cry for armed resistance against the Khartoum government as a whole. The leader of the group was quoted by the *Los Angeles Times* as saying, "We need to get rid of the Arabs. Our goal is to realize a new Sudan, by force if necessary" (Sanders 2007).

Another factor that may lead to further distrust within communities and contribute to the potential for violence is the lack of accountability in financing. The Chinese government is funding a substantial portion of the dams, and as numerous commentators have noted, Chinese funds for infrastructure are not linked to human rights standards and other international norms (Li 2006). In cases where the World Bank or other international donors provide funds, governments are more likely to comply with established and developing best practices. The absence of such incentives has allowed the Sudanese government greater latitude to avoid negotiating with affected communities.

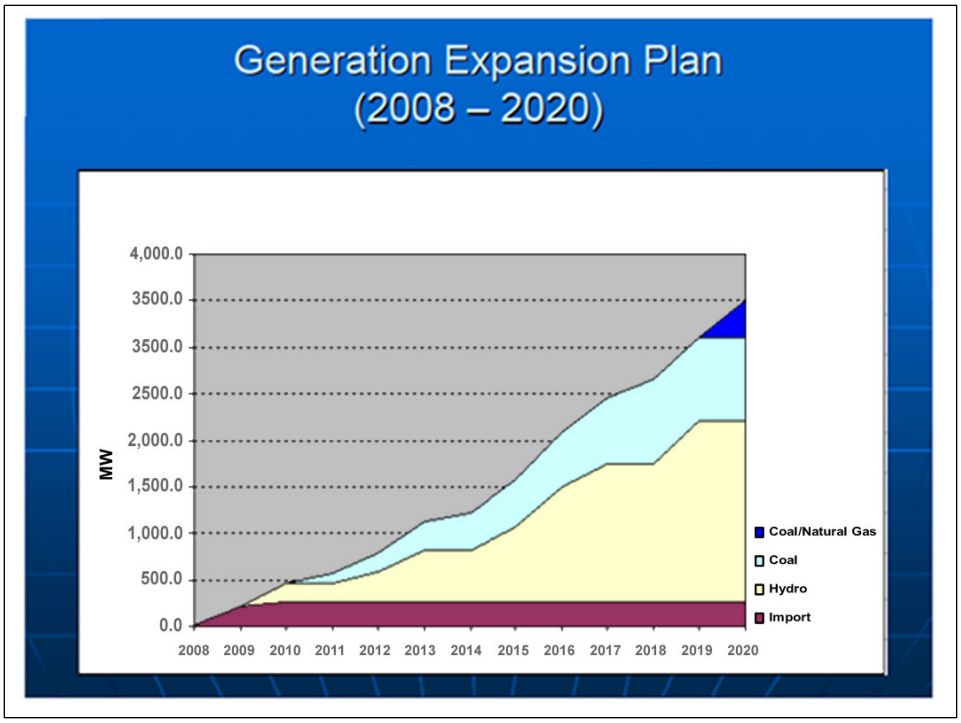
Cambodia

Similar dynamics appear to be at play in Cambodia, although at an earlier stage of development. Increasing power generation is a key goal of the Cambodian government. After years of war and neglect, only 18 percent of the population has access to electricity, and only major urban centers have 24-hour electricity (Tung 2008). This compares to electrification levels of 54 percent, 80 percent, 84 percent, and 99 percent in Indonesia, the Philippines, Vietnam, and Thailand, respectively (JICA 2007). Most of the electricity generated in the country comes from diesel-powered generators, resulting in some of the highest energy costs in Asia (Derby and Platt 2008).

Lack of reliable, affordable electricity is hampering Cambodia's economic development. To address increasing demand, Cambodia is aiming to produce thousands of megawatts of hydropower and has set out an elaborate agenda of dam building that includes 9 priority projects that are moving forward and an additional 13 projects under consideration. The government intends to produce enough surplus power to export it to neighboring Thailand and Vietnam, as well as Yunnan Province in China. The Asian development Bank is financing the construction of a regional power grid to facilitate transmission of surplus regional

production. Of the nine priority projects, three are under construction, with the other six in various stages of feasibility studies. All together, these nine projects are expected to generate 4,133 MW. The additional 13 projects under consideration would generate an additional 3,000 MW of power. (Derby and Platt 2008). As indicated in Figure 2, hydropower makes up by far the largest share of energy production envisioned in Cambodia's planned expansion of power generation.

Figure 2: Cambodia's Power Generation Expansion Plan



SOURCE: MINISTRY OF MINES, INDUSTRY, AND ENERGY, KINGDOM OF CAMBODIA.

However, both domestic and international NGOs, including the NGO Forum on Cambodia, Fisheries Action Coalition Team, and International Rivers, have expressed concern that there may be serious negative consequences for both people and wildlife as a result of Cambodia's aggressive dam-building program. For instance, the largest project, Kamchay Dam, is located within Bokor National Park and will flood 2,000 hectares of protected forest. In March 2009, villagers blocked access to a quarry providing stone for the dam's construction and demanded that the Chinese firm building the dam pay compensation for property destroyed by blasting at the site (Sokheng and Strangio 2009). The Stung Cheay Areng Dam would displace 9 villages (1,500 people) and flood an important breeding ground for the Siamese Crocodile, while the Stung Atay Dam will flood a substantial area of the Central Cardamom Protected Forest (International Rivers 2008b). In preparation for the latter's construction, a large logging concession was awarded, and environmental groups expressed concerns in June 2009 that luxury wood species were being felled illegally outside the concession area (Vannarin and Collin 2009).

Cambodia has relatively strong environmental laws regarding environmental impact assessments (EIA), as set out by the 1996 Law on Environmental Protection and Natural Resource Management and the 1999 Sub-Decree on Environmental Impact Assessment (Li 2008). In practice however, there are concerns that the EIAs being completed, especially by Chinese consultants and construction firms responsible for a number of Cambodia's dam projects, are inadequate, non-transparent, and often conducted without the inclusion of affected communities (International Rivers 2009b; Derby and Platt 2008). As ties between China and Cambodia have strengthened in recent years, China has indicated its willingness to support dam projects that other donors have rejected. After rejection of the Kamchay Dam by the Canadian International Development Agency (CIDA) because of social and environmental concerns, the Chinese stepped in. The US$280 million project is being constructed and will be operated by a Chinese firm, Sinohydro, as part of a US$600 million aid package to Cambodia (International Rivers 2008b). The financial package is reported to have gone through without the anti-corruption clauses that accompany World Bank and other international financial institutions' aid packages. The arrangement was praised by the Cambodian government because of its "no strings attached" nature (Perlez 2006).

The role of anti-corruption clauses and environmental safeguards is especially important because of pre-existing governance challenges in Cambodia's natural resources sector. Cambodia already has a history of corruption and poor natural resource management in the forestry sector. Global Witness (2007) asserts that Cambodian political elites—in association with the army, military, and Forest Administration—have been stripping the country of its remaining forests for private gain.

The intersection of fears about Cambodia's dam-building program and doubts about the government's capacity and will to enforce the country's environmental laws and natural resource management standards goes to even more fundamental problems of governance. A deep-seated political culture based on patron-client relations has facilitated rent-seeking opportunities for political elites and their allies—including those in the military and police—in the granting of extractive concessions and various forms of land grabbing (USDOS 2009). This has brought protest from local communities and NGOs as well as increasing scrutiny from domestic and international media. The kinds of grievances that have led to conflict in other countries are clearly present.

However, here again, the context of history and political culture matters. A recent interagency conflict assessment found that despite widespread awareness of and dissatisfaction with corruption in natural resource management and other areas of governance, conflict does not seem likely in Cambodia in the near future (USDOS 2009). After the catastrophic violence and genocide brought on by the Khmer Rouge in the 1970s, Cambodians (especially the older generation) are wary about engaging in behavior that might lead to violence. In fact, the patron-client system that characterizes Cambodian politics provides what is—for now at least—a stable system that lacks the "nexus of dissatisfaction and empowerment necessary for…a potential threat to the current regime" (USDOS 2009). In the meantime, many communities and civil society organizations focus on strengthening coping capacities and resilience in response to the challenges they face.

However, it is not difficult to envision the possibility of increasing conflict around the issue of hydropower in Cambodia. Prime Minister Hun Sen has been in power since 1985, and Cambodia's nascent democracy remains unstable. As the experience of the older generation fades into the past and a generation of unemployed or under-employed youth comes to maturity, traditional patterns of patron-client relations may come under increasing pressure and citizen dissatisfaction may find stronger expression. To date, corruption and rent-seeking have shown little sign of abating. In combination with the contentious social and environmental issues surrounding the long list of planned dam projects in Cambodia, these fundamental flaws in governance may eventually create heightened grievances and spur a greater degree of protest, mobilization, and conflict than currently exists.

PRELIMINARY FINDINGS

"Insecurity, discord, protest, recruitment, organization, instability, unrest, and violence are products of human behavior, which is structured by a wide array of country-specific experiences, both historical and lived as well as intangible and symbolic."

In contrast to discussions of energy security that center on geopolitical or inter-state competition, this paper has shifted the level of analysis downward to the conflict potential arising from energy insecurity experienced by national populations and local communities. Organized around three major sources of energy (oil and gas, traditional biomass, and hydropower), the analysis has examined problems of actual or potential conflict related to energy provision, access, distribution, and reliability through illustrations from eight countries (Iraq, Dominican Republic, Ukraine, Chad, Democratic Republic of the Congo, Somalia, Sudan, and Cambodia) with very different national contexts and levels of development.

The individual country cases reinforce the view that the nature of the energy security-conflict linkage is very largely a function of the political, economic, social, cultural, and historical context of a country. To say this is analogous to recent efforts to capture conflict in a more parsimonious framework (USDOS 2008b). Disaggregating these factors strengthens the analysis of setting, grievances, drivers, resilience, and windows of opportunity, and it sheds light on one of the most important considerations of all—the horizon of expectations of the relevant population. Insecurity, discord, protest, recruitment, organization, instability, unrest, and violence are products of human behavior, which is structured by a wide array of country-specific experiences, both historical and lived as well as intangible and symbolic.

This becomes apparent in looking at specific cases. For example, in Iraq, the restoration of electricity was crucial in very practical ways for daily use by households and businesses, but it was also a hugely important symbolic issue that was widely perceived as a kind of litmus test of the effectiveness and viability of the post-Saddam regime. As such, the electrical grid became a natural target for the insurgents and was hit repeatedly. Moreover, in those areas where the U.S. and new Iraqi government failed in their attempts to get the electrical infrastructure up and running, the insurgents could tap into the frustration and resentments of the population to recruit new adherents. As a symbolic issue, energy security also was subject to manipulation, and the motives and actions of the U.S. and the main Iraqi groupings (Sunnis, Shiites, and Kurds) were debated and portrayed by all the actors in self-interested ways that helped to perpetuate the underlying instability and conflict. Indeed, in a conflict or immediate post-conflict setting, because of its relevance to the entire population and its high visibility, energy security can easily become a pivotal and highly sensitive

issue on the road to peace or a return to violence.[4] In Iraq, the problems of electricity provision were simultaneously a cause, factor, and symptom of conflict vulnerability.

The Dominican Republic presents a very different case. The historical legacy left by the dictator Rafael Trujillo, whose power sector monopoly was bequeathed in a modified form to succeeding governments, was an unsustainable mismatch between operating costs and public expectations. Electricity infrastructure was underfunded, inadequate, and deteriorating, while the public became outraged at the prospect of having to pay for erratic or even worsening service they saw as a public obligation. This mismatch became embedded in a series of unsuccessful institutional adjustments, whose failures then became a political hot potato for each president who came to power. When the electricity crisis further deteriorated at the same time the state's finances were ravaged by a banking crisis that involved government corruption, sporadic unrest threatened to become something larger and more destabilizing. From an analytic point of view, neither the state's institutional morass nor the public attitudes surrounding electricity provision in the Dominican Republic could be properly understood without knowledge of this deeper historical background. In this case, an even further wrinkle can be added, namely, Dominican political culture. During the Trujillo years and the coups and civil war of the 1960s, the country witnessed a great deal of brutality and violence. As a result, most Dominicans are very cautious about letting contentious events get out of control. As great as public frustration over years of blackouts has been, it would take an extraordinary confluence of additional stresses before the electricity crisis became part of an outbreak of large-scale violent conflict.

The case of Ukraine introduces in a direct way the influence of regional and international factors in energy security. While there is interdependence between Ukraine's reliance upon Russian natural gas and Russia's need for Ukraine's pipeline to the rest of Europe, it is an asymmetrical interdependence that favors Russia in terms of size, history, commodity price, and ultimate control of the energy resource. As a hedge against future Russian gas cutoffs, Ukraine's calculations of how much gas to buy at what price in the summer or winter and the best use of its storage capacity involve a delicate balance. So far, the Ukrainian population has not had to face the consequences of a complete collapse of natural gas supplies. Even if something like such an energy crisis were to occur, its linkage to conflict, if any, would likely be as a trigger or precipitating event. The more fundamental seeds of conflict reside in Russian resentment of Ukrainian autonomy and the intersection within Ukraine of a faltering economy and intense contestation among political elites. If the leadership were perceived to mismanage bilateral relations with Russia and bring about a disruption of energy supplies that resulted in severe hardships for citizens, expressions of discontent might be transformed into more serious conflict or violence. As a further buffer, however, Ukrainian-Russian relations are enmeshed within the larger matrix of European-Russian relations, which is an additional constraint on the range of Russian options in relation to the natural gas issue. As important as the regional and international dimensions of the natural gas question are, however, not only Ukraine but also the cases of Bulgaria, Serbia, and Bosnia-Herzegovina indicate that governance and citizen perceptions of effectiveness and legitimacy are of greater consequence for conflict vulnerability in energy crises.

These three cases—Iraq, Dominican Republic, and Ukraine—involve the use of oil and gas as an energy source to provide power for mostly urban areas. These also are countries with a high degree of citizen mobilization in terms of political parties and civil society organizations (and, obviously, armed insurgents in Iraq) and relatively high levels of development by global standards, with PPP GDP per capita of US$6,690 in the Dominican Republic and US$6,916 in Ukraine (equivalent data is not available for Iraq) (World Bank 2007).

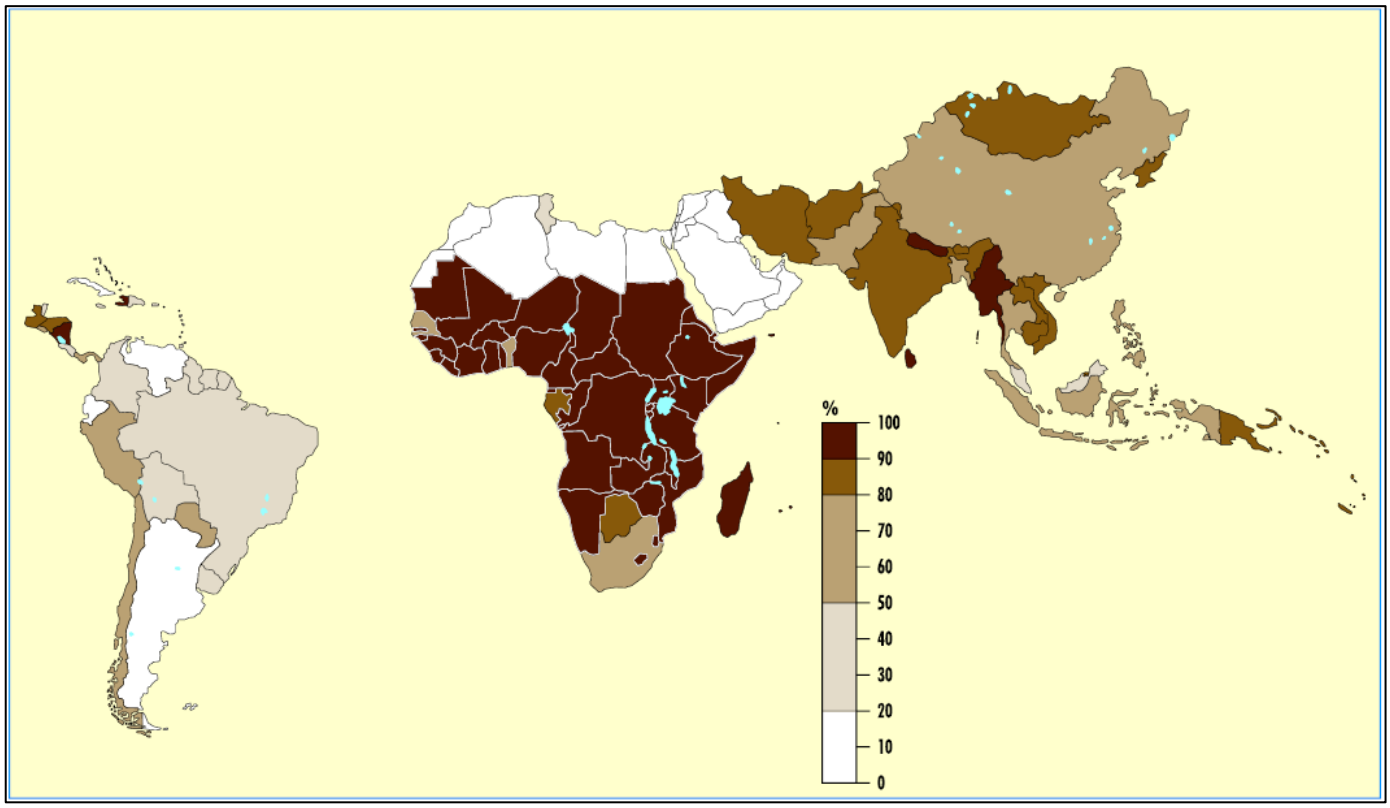
Energy security viewed in relation to the use of traditional biomass (especially fuelwood and charcoal) by poor countries with weak governance in sub-Saharan Africa and some parts of Asia presents a very different picture. One fundamental distinction in considering energy security is the differing conditions between city and countryside. In many countries of sub-Saharan Africa, the great majority of the population lives in the countryside. These people are overwhelmingly dependent on traditional biomass for their daily energy needs (see Figure 3 below). Many of them also live in countries with both rapid population growth and high rates of deforestation. While dire predictions of the exhaustion of fuelwood have not yet come to pass, and some recent studies point out that household fuelwood collection usually does not entail the large-scale felling of trees, ongoing deforestation driven by the commercial harvesting of trees means that the possibility of a Malthusian crisis in some countries—too many people relying on disappearing or depleted biomass—cannot be discounted.

Indeed, in 2005, the UN Millennium Project considered the situation to be serious enough to call for an urgent effort to help people switch from traditional biomass to modern cooking fuels like liquefied petroleum gas, with a goal of halving the number of households using biomass by 2015 (Modi et al. 2005).

The cases of Chad, Democratic Republic of the Congo, and Somalia bring to light another important variant of the relationship between energy security and conflict—the conversion of traditional biomass from an item for personal household consumption in the countryside to a market commodity in the form of charcoal for mostly urban dwellers. All three countries suffer from corrupt and weak (or in the case of Somalia, basically nonexistent) governance, with little or no regulatory and enforcement capacity. All three are highly unstable and already experiencing conflict. In each case, the sale of charcoal is unregulated and illicit, benefiting only a small group of merchants.

In Chad, the already besieged government appears to have made a miscalculation in banning the sale of charcoal in N'Djamena. Government efforts to promote propane—even after scrambling to offer a price subsidy—have not filled the residential energy gap. With no affordable alternatives, urban residents sought low-grade or improvised replacements, but in exasperation and anger took to the streets as well, to which the government responded with force. The charcoal crisis is hardly the most serious problem facing the government, but it is a conflict amplifier that adds to the instability in the country. The specifics of the situation in the DRC are quite different, but the illicit and sometimes violent charcoal trade based largely on wood taken from Virunga National Park and sold in and around Goma has led to another case of energy-related conflict entwining with pre-existing conflict. Although different in scale and commodity, the apparent involvement of both the army and the rebels in the charcoal trade is reminiscent of what transpired in the diamond mining areas of Sierra Leone and Liberia in

Figure 3: Share of traditional biomass in residential consumption by country



SOURCE: IEA 2006.

It is unclear whether severe biomass shortages in the countryside in the developing world would lead to large-scale conflict and violence. The answer to that question is very likely to be contingent on a wide range of country-specific factors and circumstances. However, given the low capacity for mobilization in rural areas in many developing countries, the more likely outcome might be a series of large-scale humanitarian crises. Although this might not directly involve agencies with specific responsibilities for conflict mitigation, it would entail immense human suffering and require urgent action by international development agencies.

the 1990s. In both instances, corruption and the absence of legal authority opened the doors for conflict entrepreneurs, who acquired financial benefits that brought both personal gain and greater conflict. In Somalia, the near-total absence of a state has left a vacuum that allows the unregulated export of charcoal to Saudi Arabia and other Gulf countries. In this lawless context, communities have sought to stop charcoal traders who are usurping already scarce energy resources, and charcoal trading clans are fighting among themselves. While certainly not inconsequential, this energy-related conflict does not rise high in the hierarchy of violence in Somalia. However, the decimation of acacia forests could lead to severe environmental consequences whose effects could produce instability in years to come.

Hydropower is a case apart and one in which globalization plays a meaningful role. The well-publicized history of the sometimes destructive effects of large-scale dam projects in the developing world on both the environment and affected communities means that such projects now are met at the outset with skepticism and apprehension. Fears over the loss of land and livelihoods, compensation issues, resettlement questions, and cultural disruptions are almost inevitable. The international anti-dam movement monitors new dam projects closely, often helping to support, organize, and galvanize local opposition. The World Bank and other donors, as well as national governments, claim to have significantly improved the vetting of the environmental and social impacts of dam projects, but a close look at environmental impact assessments (EIA) and the sometimes shoddy work of outside consultants leaves room for continued skepticism (Li 2008). In the meantime, poor countries with huge energy needs and abundant water resources are likely to continue to promote extensive dam-building with whatever financing they are able to piece together. With the World Bank still cautious about dam projects, China increasingly may fill the gap, as it did in both Sudan and Cambodia. While international best practices for large infrastructure projects call for extensive consultation with affected communities, China's conceptualization of infrastructure projects is still circumscribed by the idea of financial assistance as a state-to-state relationship, with community relations solely the responsibility of the receiving country.

In an authoritarian state like Sudan, the results of such an approach are fairly predictable. The lack of consultation, information-sharing, and accountability in the early stages of the construction of the Merowe and Kajbar dams has resulted in the resistance of communities and government responses involving the use of force that have produced arrests, injuries, alleged killings, and forced displacement. As the escalation of this energy-related conflict has dovetailed with deeper resentments of the Nubian population against the government in Khartoum, the prospect now looms for Nubia to become yet one more region plagued by unrest in Sudan. In Cambodia's far from consolidated proto-democracy, the situation with respect to dam-building is at an early stage, but is potentially no less volatile. The divergence between the government's rhetoric and legal frameworks on the one hand, and its opaque transactions and weak implementation on the other, are bringing attention to contradictions and abuse that could be the catalyst for conflict. Conversely, a more serious effort to have real consultations and ongoing dialogue with communities and other stakeholders affected by dam-building could be part of a process of strengthening the country's democracy. Similarly, China's growing role in financing large-scale hydropower projects in the developing world can either follow the current trajectory, which is likely to provoke increasing conflict, or it can be made part of the more fundamental effort to bring China into closer alignment with the rapidly strengthening norms pertaining to the extraction and use of natural resources promoted by the OECD and the United Nations (OECD 2001; OECD 2008; Voluntary Principles n.d.; Le Billon 2007). Development agencies can play a constructive role in encouraging change in the direction of these more promising pathways.

CONCLUDING CONSIDERATIONS

The body of literature that tries to address the linkages between energy security and conflict with a conceptual focus similar to that used in this paper—one based on attention to discord, contention, instability, and unrest in urban and rural settings within country-specific contexts—is very limited. Beyond the study of energy-related conflicts at the level of high politics and inter-state disputes and the special attention given in recent years to conflict in resource-rich countries, there is a dearth of systematic studies.[5] This paper is a very preliminary effort to relate a number of specific country cases to broader themes and select energy sources. However, much more needs to be known in much greater depth about a much larger set of cases in order to strengthen and refine the kind of approach taken here. This constitutes a significant knowledge gap, but with further dialogue between researchers and practitioners it would not be difficult to identify a viable and productive research agenda grounded in a comparative case study methodology. As a first step toward encouraging further thinking about energy security and conflict, a set of sample questions for practitioners is given in Appendix 11.

Looking forward, one additional gap in knowledge that has not received sufficient attention is the possible impact of climate change on energy security and conflict. Increasing land temperatures, storms, and droughts could reduce or disrupt already scarce energy supplies, multiplying and exacerbating energy problems and conflict vulnerability in affected countries. It should be possible to investigate and analyze scenarios that incorporate projected climate change effects in countries already susceptible to conflict from energy-related problems.

Despite the need for further study, a few themes and issues linked to energy-related conflict emerge clearly from this preliminary review and suggest the need for programmatic responses. All of the cases examined involved serious problems of governance. In the developing world, amid rising expectations, governments continue to fall short in terms of not only infrastructure but also the regulatory and enforcement capacity to ensure adequate energy, reasonable access, equitable distribution, and some degree of reliability. Efforts are ongoing to address the technical aspects of these problems as well as to build institutional capacity—and they should continue. If citizens perceive that their material needs related to energy are not being met, especially in urban areas, they are likely to mobilize and protest, and in poorly governed states those protests are likely to interact synergistically with other core grievances. However, grievances also often develop out of frustrations and anger that are fuelled by a lack of reliable information and a sense of exclusion. Much more could be done by development agencies to build the capacity of civil society organizations and community groups to collect and share information about key energy issues. Similarly, capacity building to strengthen public participation at the local level can help to limit the destabilizing effects of rumors or misinformation that often heighten tensions. This is especially relevant for areas that are either in conflict or are immediate post-conflict settings.

In countries like the Dominican Republic and Ukraine, the core challenge is to develop an efficient and rational power sector amid historically embedded political relationships that are highly dysfunctional and inefficient. In Ukraine, these relationships are made even more difficult by cross-border politics and corruption. However, the transition to a more autonomous, accountable, and robust regulatory environment can be fraught with conflict. Development practitioners need to keep in mind these risks and link the "rationality" of reforms to the complexities of the broader political economy.

Where energy problems are "overdetermined" by macro-level political and economic factors, a variety of small-scale pilot projects to develop community resilience through emergency reserves,

improved energy efficiency, and alternative energy should be tried on an experimental basis to learn more about what works under what kinds of conditions. In much of the developing world, especially Africa, there is clearly a need for a massive shift from traditional biomass to liquefied petroleum gas and other alternatives. Obviously, the diversification of energy and the development of solar, wind, and geothermal power sources also are highly desirable.

In relation to hydropower, the decade-long pause in dam-building may be coming to a close. If so, a rise in conflict also can be anticipated. The need for capacity building in the areas of environmental impact assessments and compensation and resettlement issues is enormous. Here again, in what is almost always an information-poor context, strengthening mechanisms for public participation and the dissemination of reliable public information is crucial for conflict management and mitigation.

Overall, what is the benefit to be gained from devoting resources to research and program initiatives related to energy-related conflict vulnerability? The findings of this preliminary review indicate that there is a consequential relationship between energy security and conflict in a variety of developing and conflict-prone countries. Often energy problems are significant amplifiers of conflict that add to the stresses of already fragile states. However, very few current programs and projects directly address actual or potential energy-related conflicts. The energy-conflict relationship can be researched in a meaningful way that attends to the specificities of context while also identifying significant patterns and accumulating the empirical basis for crafting program options. A focused approach to energy security and conflict also increases understanding of how conflict develops in relation to different energy sources and how trends in energy supply, including interactions with climate change, may impact stability in vulnerable countries in the future. Even where severe energy problems and energy-related grievances ultimately do not result in conflict, project interventions by development agencies are likely to help avert the possibility of humanitarian crises.

Endnotes

1. This section relies heavily on "Environmental security in the Dominican Republic: Promise or peril?" published by the Foundation for Environmental Security and Sustainability in 2005.

2. Arnold et al. note that patterns of firewood demand vary greatly between regions and even within countries. In South Asia, firewood use is thought to have reached a peak, and its use in Africa, while still growing, is increasing at a slower rate than population. South American countries do not rely heavily on firewood, and there consumption is growing only marginally (Arnold et al. 2003).

3. Sneddon and Fox offer the following definition for the anti-dam movement: "networks or coalitions that operate locally, nationally, and transnationally…and are composed of community-based organizations…local and national NGOs of specific countries, international advocacy groups, and an assortment of academics, media members and (on occasion) sympathetic government officials" (2008).

4. But, again, context is crucial, and this need not be the case. Consider Sierra Leone, where a formal peace agreement was signed in January 2002. The country's infrastructure had been destroyed in a 10-year civil war. In the capital, Freetown, there was no electricity whatsoever until late in 2008. Yet, despite some grumbling, there was no real expression of public discontent until the political campaign heated up in 2007. The reason is clear. In an extremely poor country without oil resources, the horizon of expectations of Sierra Leonean citizens was correspondingly low.

5. This appears to be true for development agencies as well. For instance, in a recent review of its energy-related activities to "empower development," USAID (2005) noted the linkages in its programs between energy and a number of issue-areas, including gender; small and medium enterprise; natural resource management and the environment; health and education; economic growth and trade; water and agriculture; and democracy, governance, and conflict management. Many of these activities indirectly touch upon aspects of the problems and issues discussed in this paper, but the efforts to address directly the energy-conflict relationship have been quite limited. The only specific initiatives to address energy security and conflict were restoring power in Iraq and efforts to develop alternative energy sources in Mindanao in the Philippines.

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APPENDIX I

Energy Security and the Resource Curse

Energy security is normally associated with adequate and accessible energy supplies. It is not difficult to see that energy shortages or maldistribution can lead to competition and conflict over scarce resources. However, it is less immediately apparent how resource abundance—sometimes called the "resource curse"—also can lead to instability and conflict.

In countries that have both high-value energy resources such as oil and gas and poorly developed financial, judicial, and governance systems, the oil- and gas-generated revenues regularly worsen problems such as corruption, lack of governmental accountability, and income disparities (Humphreys et al. 2007). These problems can interact with pre-existing or new political, social, or economic grievances and contribute to conflict. According to Michael Ross (2008), oil-producing states "now host about a third of the world's civil wars, both large and small, up from one-fifth in 1992."

There are a number of contributing factors to this somewhat counterintuitive but increasingly common phenomenon. Given the price volatility in energy markets, economies that are heavily reliant on energy exports are subject to booms and busts, and fluctuations in export earnings trigger exchange rate instability. The Netherlands experienced this type of economic instability in the 1960s, in the wake of massive revenues realized as a result of North Sea oil, thus giving the phenomenon the name of "Dutch Disease." Exchange rate instability has a negative effect on trade and foreign investment, while the inflow of foreign capital during oil booms has inflationary effects on domestic goods (Gylfason 2001).

In today's highly integrated global market, the ability of oil-producing countries to unilaterally lower or raise commodity prices is limited. Global demand, refining capacity, technological innovation, and political events drive oil price fluctuations. Stabilization or "rainy day" funds have been created in some countries to help even out cycles of fiscal surges and debt, but the political dynamics of poor countries often create strong pressures to use all available revenues rather than invest them for the future.

The potential for high revenue earnings from oil and gas extraction and production is a disincentive to invest in the other areas of a country's economy. Instead of investing in the kinds of manufacturing and service exports that might contribute to stable and sustainable long-term growth, governments tend to rely almost exclusively on energy export rents. The volatility produced by domestic institutional weaknesses and external market instability can increase the likelihood of social tensions.

Resource abundance also can also undermine good governance. When a government can depend on a natural resource to provide a consistent and large stream of revenue, not only can it neglect other sectors of the economy, it often no longer requires a significant tax base from the citizenry to finance expenditures. This situation tends to delink the agent-principal relationship between the government and its citizens. Such countries are likely to forgo investments that enhance the productive capacities of their citizenry. The governance system is "less subject to the types of countervailing pressures that help to produce bureaucratically efficacious, authoritative, liberal, and ultimately democratic states precisely because [it is] relieved of the burden of having to tax [its] own subjects" (Karl 2007).

Ruling elites worry little about securing popular support and long-term development of the country; instead, they become narrowly focused on short-term financial and market gains. Typically, socioeconomic inequalities are extreme, human development levels are low, and corruption is rampant (e.g., Angola, the Democratic Republic of Congo, and Nigeria/Niger Delta). In part, this is because "resource royalties enable political leaders to maintain their stranglehold on power by funding a system of patronage that rewards followers and punishes opponents" (Renner 2002). Conversely, high value energy resources sometimes can fall into the hands of insurgents, who use them to fund their rebellions, often in ways that exacerbate ethnic grievances.

Recent research shows that developing countries producing oil are twice as vulnerable to an internal uprising as non-producers, and conflicts in oil-producing countries appear likely to increase as world oil prices rise (Ross 2008).

SAMPLE QUESTIONS FOR ENERGY AND CONFLICT ANALYSTS

The questions below illustrate the types of energy and conflict issues that should be addressed by all analysts, but they are divided into questions that energy specialists and conflict specialists, respectively, should ask. They assume that the main goal of energy specialists is to implement programs that promote adequate, accessible, and sustainable energy supplies and that the main goal of conflict specialists is to identify programs that help prevent, mitigate, and manage instability and conflict.

QUESTIONS THAT ENERGY SPECIALISTS SHOULD ASK:

1. What is the history of the energy sector? How did it come to be in its present state?
2. How have each of the following factors impacted the development of the energy sector?
    a. Political and institutional history (patronage, institutional control)
    b. Economic factors (distribution of wealth, patterns of ownership)
    c. Social structure and group identity (ethnic and religious divisions)
    d. Cultural practices (non-economic preferences and values, symbolic value, status)
3. In what ways do the factors in question 2 represent current obstacles or constraints on energy sector reforms and programs? What are the implications? Is there potential for conflict? If so, how can conflict be avoided?
4. What is the level of legitimacy of the government? Do citizens perceive it to be credible and accountable? Is it perceived to be corrupt? What are the implications of these citizen attitudes for energy sector reforms and programs?
5. What are the expectations of the population with respect to energy supply and provision (low, medium, high)? Is adequate provision of energy seen as a government obligation or quasi-public good?
6. Are there pre-existing conflicts or grievances in the country that are likely to intertwine with energy sector reforms and programs? If so, how and with what implications?
7. Do proposed programs factor in the conflict implications of sudden price increases?
    a. What are the current coping mechanisms for energy price fluctuations?
    b. Will there be subsidies or other compensatory measures for poor groups?
8. Will proposed energy initiatives and programs impact the environment, particularly resources upon which communities are dependent?
    a. Will any of these impacts threaten livelihoods negatively or otherwise impact human security (loss of lands, relocation)?
9. Has sufficient public information been provided to explain energy reforms and programs in a way that will minimize misunderstandings and avert conflict? Is there a plan in place to do this on a continuing basis?
10. Are energy sources targets of strategic or symbolic value to rebels or discontented groups?

QUESTIONS THAT CONFLICT SPECIALISTS SHOULD ASK:

1. What are the main sources of energy (e.g., oil and gas/ electricity, biomass/charcoal, hydropower, etc.), and are they subject to access limitations or supply disruptions?
2. What are the expectations and needs of the population with respect to energy?
3. Is there a significant history of disturbance in the energy sector?
    a. Are there tensions stemming from unequal access to or distribution of energy resources?

a. Have there been episodes of violence or protests linked to the energy sector or access to energy resources?

b. Have energy shortages caused involuntary migration within or across borders?

4. Are energy prices stable and affordable?

   a. If prices are unstable or unaffordable, what are the coping mechanisms used by the population?

5. What role does the government play in energy production and distribution?

   a. Is the government perceived to be corrupt or rent-seeking in its handling of the energy sector?

   b. Does the government have monopoly control of the energy sector?

   c. Has the sector been recently privatized? If so, what are public attitudes toward the privatization process and outcomes?

6. How is the energy sector structured and regulated?

   a. To what degree do energy regulatory bodies have autonomy, authority, and accountability?

   b. Are there dispute resolution mechanisms in place?

7. How can energy sector reforms and programs promote stability and prevent conflict?

   a. How can energy programs contribute to poverty alleviation?

   b. How can energy programs meet the needs of aggrieved populations?

   c. How can energy programs contribute to more transparent and accountable governance?

8. Are there nongovernmental conflict management institutions (civil society organizations, traditional leaders/elders) that can mitigate conflict surrounding energy use and distribution?

9. In conflict areas, is the need for energy creating additional problems that may prolong conflict or make it harder to settle?

10. Is the demand for energy leading to environmental degradation or displacement that is likely to generate conflict?

11. Do geopolitical or inter-state energy disputes impact energy supply and local populations?

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