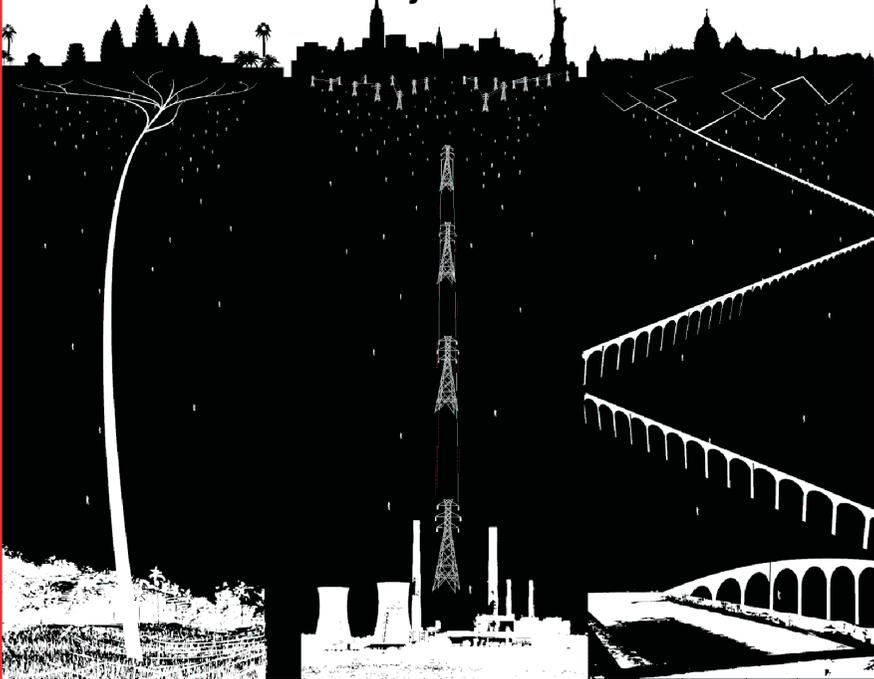


ENERGY SECURITY 2.0

**How Energy is Central to the Changing Global
Balance in the New Age of Geography**

**Gregory Copley ■ Andrew Pickford
Yossef Bodansky ■ David Archibald**



Angkor Wat: Canals

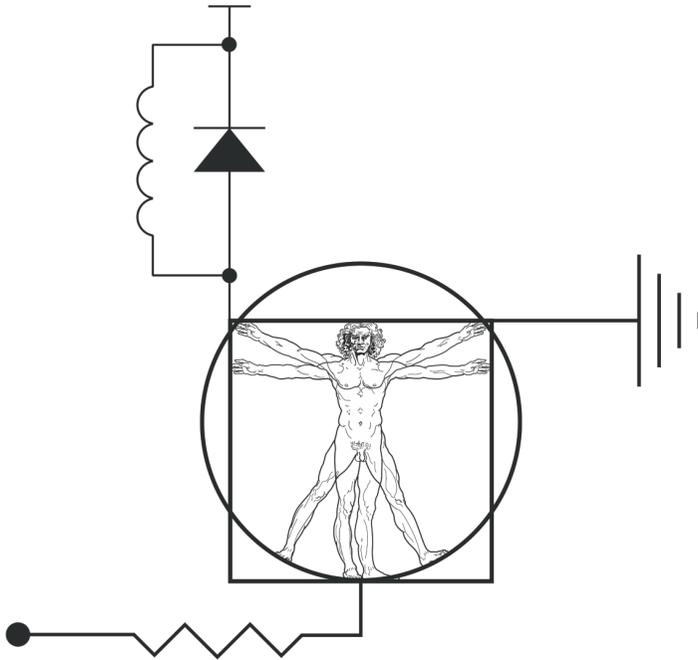
New York: Electricity

Rome: Aqueducts

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Energy Man: See Chapter I, page 11.

Energy Security 2.0 refers to a revised version of energy security thinking. Like “Web 2.0”, from which the terminology is derived, this study offers thinking which joins the dots and avoids preoccupation with the gadgetry or euphoria of a technology, system, or source of energy (ie: quantifying oil reserves and building hydrocarbon supply models). Instead, like the e-commerce offerings, it offers a “2.0 version” of energy security thinking, using tools to understand context, options, and outcomes.

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G R. C
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A STUDY FROM



The International Strategic Studies Association

AND



ENERGY SECURITY 2.0

How Energy is Central to the Changing Global Balance in the New Age of Geography

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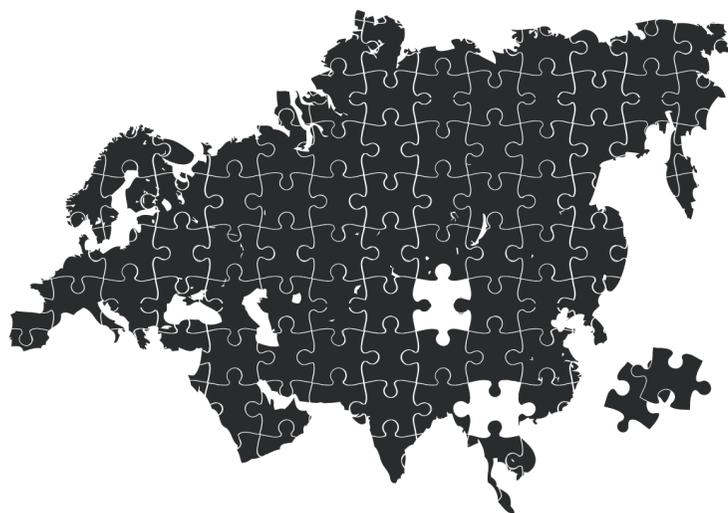
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Preface

The New Age of Geography

ES . . . is a term to express how some very new and profoundly strategic patterns of global change are emerging. They are occurring particularly in how we use energy, and how modern society has come to integrate energy as the key determinant of the survival of urban-dominated states.

Moreover, as this study shows, geography — temporarily sidelined as the core strategic constant during the brief period of globalization — has once again become a basic element of emerging social and power balance changes. One of the themes of this study is the evolution of the Eurasian continental states as an increasingly integrated *bloc*, and the separate evolution of maritime powers. These groups have different outlooks on governance, commerce, and, in some respects, energy systems.

The name of this study — Energy Security 2.0 — says that the world is in a totally new generation; a new era. We, the authors, felt that policy officials (and, indeed, all who require some element of control over their future) needed to better understand the new and pervasive aspects of energy (in terms of sources, technologies, and distribution); how modern societies now integrate their consumption of

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energy to the point of, literally, life-and-death dependency; and how all of these factors are central to — and influenced by — the transformative changes which are also occurring in the global geopolitical and power balance.

This is, therefore, a study which is explicitly contextual, while addressing the fundamental elements — the historical and current building blocks — of our emerging dilemmas and opportunities. The iconic graphics by artist Alexander Locke, of Perth, Western Australia, serve to highlight the topics we discuss in the study.

The International Strategic Studies Association (ISSA), as a global organization for strategic policy officials, based near Washington, DC, in 2008 and 2009, initiated the annual Indo-Pacific Energy Security Round-Table, in Perth, Western Australia. We conducted the Third Indo-Pacific Energy Security Round-Table (3ESRT) in Washington, DC, from November 2010 until publication in January 2011, with our companion organization, ISSA Indo-Pacific, which is based in Perth, Western Australia. We conducted 3ESRT as an electronic *and* direct colloquium, running it as an ongoing project, with constant discussion and idea exchange. This enabled the development of the resulting chapters which make up this volume to reflect appreciations of the differing perspectives and backgrounds of each of the authors.

What has emerged is absolutely a focus on *context*: historical, geopolitical, social, and security context. We have, we hope, delivered something which is, for the first time, both global in perspective and also rising above a preoccupation with the material origins of energy sources and particular energy forms, and the means of achieving the security of delivering energy. We have attempted to see where the world is going, in terms of why and how energy dependency has evolved in modern (ie: urbanized, neo-post-in-

dustrial) society, and why this reality is very different from the world of even a few decades past.

How modern societies have integrated energy to become the core of viability — and vulnerability — of modern urban societies will, in the coming decades, determine absolutely the security of societies; and how defense thinking, doctrine, and structures must change. We must also consider the vulnerability of modern, energy-integrated societies to transformations in social and economic patterns which determine the likelihood for direct and indirect interstate conflict. In this light, we can see that modern societies have committed their security to structures and systems built for a world which — for them — in many respects no longer exists. The world of traditional defense structures exists primarily in traditional societies.

Notwithstanding the apparently unique scale of the present and coming global transformation, it is evident that historical lessons truly apply to policymaking in the first half of the 21st Century. One of our authors, Andrew Pickford, cites the highly-relevant “laboratory” lessons from the rise and fall of Angkor Wat and Rome, for example. Author Yossef Bodansky looks at the spread of the energy linkages across the Eurasian landmass and the impact which that integrating logistical net — the Great Silk Energy Route — will almost certainly have on Euro-American relations. Author David Archibald looks at the interactive impact of emerging technologies and economics to determine some of the directions of the energy (and therefore survival) frameworks of modern societies.

We mention the growth of natural gas as one of the short-term feed-sources, impinging on the dominance of oil and coal, of modern energy addiction. In this regard, we will see, in the next few years, the impact which new gas discoveries will have on the Eastern Mediterranean region, for

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example, transforming the relative strategic positions of Israel, Turkey, and Cyprus, quite apart from the recent transformation of Turkey — first called to public attention in our *Defense & Foreign Affairs* reports — from an integral component of “the West” to becoming a key component of the Russian energy and security framework.¹ This study does not dwell as heavily on the growing African-Mediterranean energy developments, which we will expand on in separate studies, but readers of this volume will easily see how the growth of African and trans-Med pipelines and energy sources fit within the global pattern we describe.

The three appendices to this study highlight some of the developmental and conceptual work in moving toward our present view of “Energy Security 2.0”.

Our work on energy and energy security, within the framework of grand strategy, has been underway since 1972, and even then drew on the great, pioneering conceptual work of Dr Stefan T. Possony, who co-founded both *Defense & Foreign Affairs* and the International Strategic Studies Association with me. This firm foundation — the broad shoulders of Possony’s thinking — has helped our insights into energy and into global strategic trend analysis generally. But without the brilliance of my colleagues in this project — Yossef Bodansky, Andrew Pickford, and David Archibald, and others who participated in 3ESRT, such as philosophical thinker Dr Assad Homayoun; and Craig Lawrence, AM, Chair of ISSA Indo-Pacific Board of Advisers — we could not have transformed the view from Possony’s shoulders into the study now before you.

We hope it will stir debate.

— G R. C : Alexandria, Virginia, January

1 See, for example, Copley, Gregory R.: “Turkey Makes its Strategic Choice: Russia” in *Defense & Foreign Affairs Special Analysis*, March 3, 2009, and “Turkey’s Strategic Options Shift as the Country Becomes Increasing Isolated” in *Defense & Foreign Affairs Special Analysis*, February 27, 2009.

I

“Energy Man” Now Defines Modern Society

By Gregory Copley

E ^a*component, an organ,* of the human being in modern society. Energy dependence/-capability — the combination now a fundamental trait of modern human logic and survival — is what separates “modern societies” from “traditional societies”. Energy has become integrated into the modern human, as much a part of *belief* systems as other social belief systems are in traditional societies.

As this reality evolves, we are also aware that the chaos of change has been encroaching on an almost global scale. But the mere knowledge that the present and anticipated levels of change was coming — particularly in “modern” or Westphalian forms of society — has not sufficiently prepared most institutions of state for that change. Societies and their institutions change gradually, almost imperceptibly.

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The great British constitutionalists, J. R. Tanner and Walter Bagehot, agreed that the “existence of the Crown serves to disguise change and therefore deprive it of the evil consequences of revolution”.² We are now in a transitional period in which the success or survival of existing modern societies will be defined by “change disguised as *status quo*”, and failure will be marked by sudden and disruptive events.

Apart from the overall transformations in social structures, including the viability of various forms of governance, what has been perhaps most significant has been the gradual evolution of the global energy environment. We have witnessed perhaps 10 millennia of human dependence on external forms of energy (more, of course, if we count the reality that food is the fundamental form of human energy). In June 2008, I noted: “The immediate and direct strategic linkages between energy, food, water, social stability, and strategic power are now more profound and global than ever before, thanks to emerging technology and the globalization of markets and trends.”³ We have witnessed the evolution of energy markets and technologies — such as the transforming uranium and thorium reactor prospects — over the past decade. We have seen the sudden surge in Eurasian (and for that matter, to a degree, African) oil and gas pipelines resembling the evolution of synaptic links in a growing human brain. The Eurasian Continent’s pipeline and powerline linkages, coupled with fossil-fuel-powered land, sea, and air infrastructural growth, are spreading like a visible flood from the Pacific to the Atlantic.

The entire fabric of Continental Eurasian society, linking East Asia with the Atlantic-Mediterranean European states,

2 Cited, for example, in Copley, Gregory: “The Purple Banners Stream”, in *Defense & Foreign Affairs*, May-June 1990.

3 Copley, Gregory: “The Energy-Food-Water-Security Matrix”, in *Early Warning*, in *Defense & Foreign Affairs Strategic Policy*, 6-2008.

is beginning to feed from that interactive arterial energy/logistical system. In geographic scope, this is unrivaled. In terms of systems complexity and human integration, it will move in the same direction as the compactly interdependent energy-social system in the North-Eastern North American Continent. There, increasingly, it is becoming impossible to separate out “energy” — the electrical carrier force — from the computing and communications interactivity which literally enables society to function.

In technologically advanced societies — modern societies — the removal of “energy” is the removal of communications, food and water production and movement, manufacturing, human survivability (and/or productivity) conditions, and human and product mobility. Interference with any aspect of the neural network of energy/communications/computerization renders the society helpless. Large urban gatherings of people (and the world’s population is now preponderantly urban) cease to be viable within days, or at best weeks, of a sustained interruption of electric impulses; even the delivery of combustible fuels for mobility are now dependent on this interactive network. On the other hand, modern life, as it has developed over the past 120 years, is feasible because of this patchwork evolution of interactive networks. This is modern society’s greatest strength *and its greatest vulnerability*, given the potential for sudden, sharp, and catastrophic interruption.

The reality now is that, in the past decade of this staggeringly rapid transformation of human society — 120 or so years out of some six-million years of modern mankind — the cementing of the energy/communications/computerization matrix into human viability has rendered meaningless a focus merely on the raw components of energy. In other words, just as the “bronze age” was not about bronze itself, but about what bronze implements could achieve, so

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the ages of coal and petroleum have passed astern of us. We are in an integrative phase in which bronze, and iron, and coal, and petroleum — and whatever else — are now but old building blocks, not important for themselves, but merely representing the fact that such a material substance represents the *kind* of tool required to achieve the outcome required of human society.

In a report in 2010, this writer said that the “age of gas” had begun in earnest⁴, to indicate that gas as a fossil fuel was about to become a major energy component to rival (and perhaps dwarf) petroleum, but it was not meant that modern society was moving from “the petroleum age” to “the gas age”, because petroleum, gas, nuclear power, and so on, are now merely alternate tools in the delivery of desired outcomes.

The *outcome* we desire is not oil, or gas, or uranium, nor even access to these commodities. The *outcome* we desire is societal, and even species, survival and the dominance (ie: freedom from being secondary considerations) of our own group or society. We are so embroiled in the *process* of survival or life that we forget the outcome we desire.

At this point it is necessary to outline a maxim which should have been articulated long ago: ***Preoccupation with process and means is tactical; preoccupation with outcomes and future context is strategic.*** With regard to energy, we can already see that sustaining and protecting the neural networks of interactive electricity/communications/computerization is a priority with direct impact on the non-negotiable strategic outcome of societal survival. How this process is fed is a tactical process.

Commodities and products are tactical; what is done with them determines strategic outcomes. Oil, gas, internal

4 Copley, Gregory: “Energy and Security Issues in the Red Sea Transforming as ‘the Age of Gas’ Begins in Earnest”, in *Defense & Foreign Affairs Special Analysis*, August 18, 2010.

combustion engines, semaphore flags, the theory of relativity: all were building blocks helping to define “victory” (ie: the desired outcome) at a certain stage. It is essential, therefore, to focus on outcomes, and to be aware of the vulnerabilities (as well as possibilities) which our accretion of tool-building has given.

In this, perhaps it is possible to proffer one more maxim: ***All steps forward are based on vision; all steps backward are based on budget.***

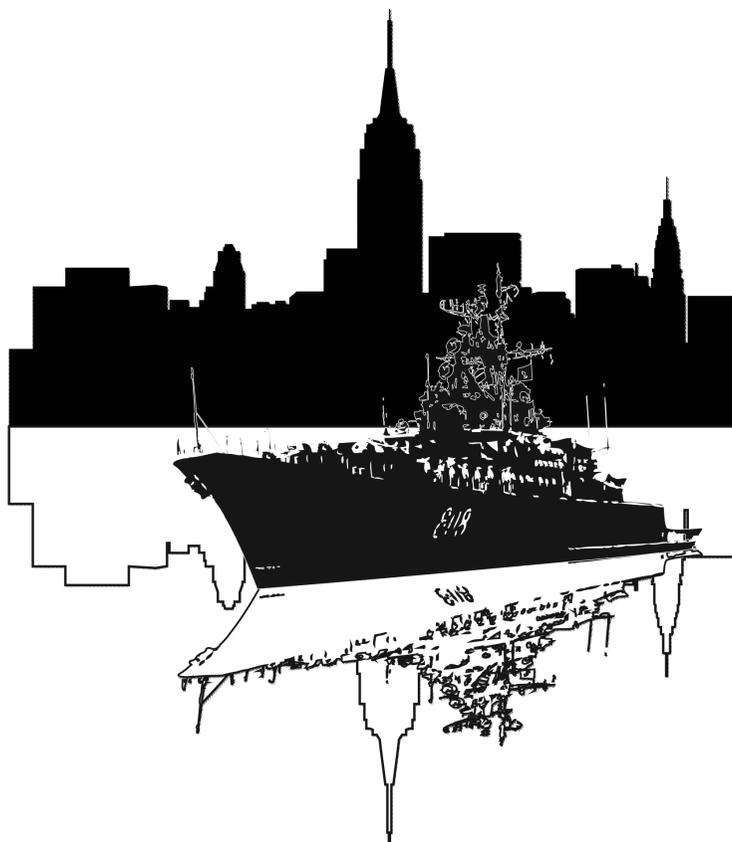
Our “total man” constitution of human/electrical/communications/computerization is so delicate that, in this time of global transformation, an absence of vision could reduce humankind rapidly in its welfare, and even its survival.

Within this matrix, we can see how much farther “modern” society has diverged from “traditional” society within the past half-century. We persist in measuring societies against each other by comparing their economic strengths as measured by gross domestic product (GDP). The US Central Intelligence Agency (CIA) some years ago recognized that this was becoming a meaningless comparison and began defining relative GDPs on the basis of “purchasing power parity” (PPP). That more reasonable approach, however, must now be *further* qualified, to understand that “modern”, Western societies have become — in some utopian/delusion sense — pseudo-post-industrial, and their GDPs are now dominated by consumer spending.

In essence, then, we should recognize that ***modern, pseudo-post-industrial GDPs are dominated by consumption, whereas traditional GDPs are driven by production.***

It is not difficult to see that “modern” societies, then, have become vulnerable. Traditional societies, which are more self-reliant, have gained real strategic advantage.

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II

Heartlands, Rimlands, and Oceans: a New Age

By Gregory Copley

T into “the great heartland” of the Eurasian continent, and “the great oceans”, which remain essentially Western, but which are increasingly contested. It is time, then, to look with new eyes at the great teachings of Rear Admiral Alfred Thayer Mahan⁵ and others on sea power; geographer Sir Halford Mackinder⁶ on heartland theories; Stefan T. Possony on air power; and Alexis de Tocqueville on great power development⁷.

5 Particularly his most popular work, *The Influence of Sea Power Upon History, 1660—1783* (1890), but also other writings.

6 Particularly Sir Halford’s *The Geographical Pivot of History* (1904), which articulated heartland theory, and several other books including *Britain and the British Seas* (1902).

7 See, Possony, Stefan T.: *Strategic Air Power for Dynamic Security*, Washington, DC, 1949: The Infantry Journal Press. Alexis de Tocqueville (1805-1859) covered, in his *Democracy in America (De la démocratie en Amérique)* (1835, 1840), the inherent differences between Russia’s approaches to expansion and the approaches of the US, and foresaw the great power competition between Russia and the US.

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We may look back and see 2010 as the year in which the new geopolitical shape of the world became more clear.

By 2010, too, the six decades of Western aerial dominance was essentially over. This is something which — like the loss of maritime dominance — is not necessarily evidenced, initially, by the loss of combat engagements. Where the balance is changed is in the constraints which *the knowledge of limitations ensures* on the projection of power, making the decline of influence inevitable.

Mackinder saw how the Russian Empire, by the early 20th Century, had brought under its dominance or influence much of Central Asia and Eastern Europe, excluding Western Europe, India, and East Asia (China and Korea, for example). Today, we see a trading and strategic pattern embracing the *entire* Eurasian continent. This is more of a mosaic of interests than a map of hegemonic clarity. It is a mosaic in the form of a cauldron of differing interests and competition, but it has nonetheless finally achieved a continental shape and interdependence which has never before been visible on this scale of completeness .

What is significant is that this over-arching “heartland” shape — including, as I noted, many contradictions and competitions — firmly isolates some of the maritime extremities, such as India, the United Kingdom, and Japan. The interests of the heartland are increasingly separate from, and sometimes competitive with, the Atlantic/Pacific powers: the US, Canada, Australia, the UK, and so on. These two emerging *blocs* are not necessarily mutually hostile, but they have divergent interests, perspectives, and destinies.

By 2010, the relative strategic fortunes of the maritime powers — essentially the Anglosphere and Japan — were declining in direct proportion to the rise of the Eurasian collective. The maritime powers are foundering upon a

malaise of leaderlessness and hubris: it is *that* which is hindering the retention of their wealth and power. The heartland states are stumbling with inefficiency and petty suspicions toward their economic and strategic growth: it is that *dysfunction* which hinders — and may undermine — the evolution of the great Eurasian integration.

The new Great Silk Route is the spinal cord of the emerging Eurasian heartland trading and structural entity. The Great Silk *Sea* Route, linking the Pacific to the Atlantic through the Indian Ocean, is still outside the grasp of the heartland, and control of this remains with the maritime powers, at least for the time being.

The People's Republic of China's sway over the Pakistan landbridge, which links the PRC with the Indian Ocean, constrains India to look seaward. This is a reality which is central to Beijing's strategy but has yet to be understood by most Pakistanis and Indians. India, then, cannot effectively look to the Central Asian hinterland as long as it cannot build an overland link through Pakistan to Iran, Afghanistan, Tajikistan and Turkmenistan, into the Eurasian trading pattern of the revived Great Silk Route. Thus the PRC ensures that India cannot look landward. At the same time, Beijing is building a navy to challenge India — and the maritime West — at sea.

We have witnessed the declining ability of India, despite its significant economic growth in recent years, to compete strategically with the PRC. [The PRC, with a 2009 est. GDP of \$4.98-trillion, ranked third among sovereign states in terms of GDP levels, while India, with an est. 2009 GDP of \$1.2-trillion, ranked 11th; the gap between the relative strength of the two states increased substantially over the preceding decade.] Thus, India can only compete strategically with the PRC as a trading and maritime state, and diplomatically; not as a continental power.

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India, if it cannot wrest control of (or influence over) Pakistan from the PRC, or see Pakistan disintegrate through internal implosion, must, perforce ally itself with the Western maritime nations. At the same time, India's main strategic option must be to attempt to win back friendship — this time on an equal basis — with Russia, at China's rear.

Pakistan, for its part, will, when the US again abandons it after withdrawing from Afghanistan, be unable to seek a balance between two courting allies — the US and the PRC — and will be locked into a marriage with Beijing.

The PRC, meanwhile, has become the hidden force projecting into Europe, and into the Mediterranean and Persian Gulf, while Russia — itself also geographically only an indirect Mediterranean power — projects itself there more openly.

The relative clarity with which the great geopolitical *blocs* are emerging — between the heartland and the maritime states — suggests that the Western European states, because of their dependence on Russia and Central Asia for energy and trade, must look more to the East, and less to the Atlantic. Britain, then, is now, again, a maritime state, even though it has denuded itself of the maritime power, comprehensive manufacturing, and trading basis which was its strength. British conservatives had rightly looked askance at the suggestion that the UK was a “European state” in the same sense, and outlook, as the Continental nations.

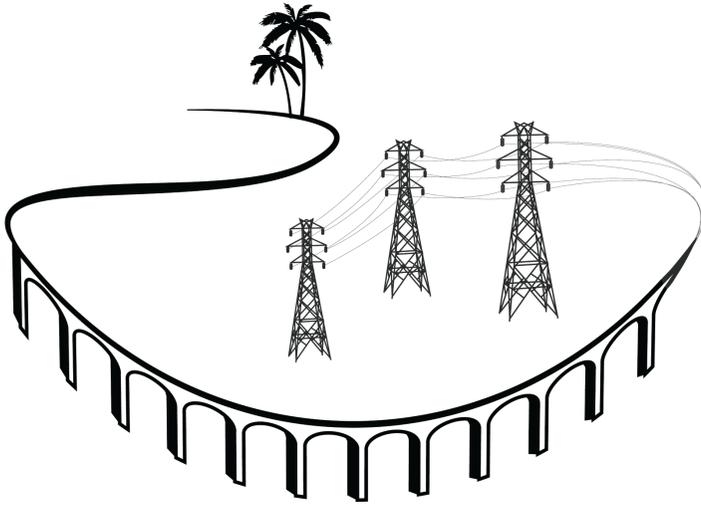
The Republic of Korea (RoK), slightly separated from the Eurasian heartland by the land blockage which North Korea (DPRK) represents, is torn between being a Eurasian power, or a maritime power. It tends toward the latter, and, as such, must continue to rebuild its strategic links with Japan, the North American leaders (US and Canada), Australia, India, Indonesia, Britain, and so on. Most significantly, the Republic of China (ROC: Taiwan) must henceforth re-

gard itself as a major island *maritime* trading nation. Taipei must seriously reconsider its commitment of some 80 percent of its defense spending to a static army. The ROC Army was designed as a continental army and maintained to “return to the mainland”. Later, in static mode, it was to defend against a PRC amphibious assault. Now, the ROC must commit more to maritime and air power. Unless it does so, and finds ways to build discreet relations with the maritime powers, it will become strategically meaningless within a decade or so.

Australia, now the third largest foreign investor nation in the world, looks to the PRC as the major source of export earnings, a factor which compromises its strategic self-perception. The US Clinton and Obama administrations sold their souls to the PRC to get cheap material goods for the US public, destroying much of the US industrial base in the process. Now, the relative decline in the US dollar could well make revived US entrepreneurship affordable, if only Pres. Obama would cease to punish investment in US industry, and unleash the US private sector again.

So, the great strategic realignment is now emerging. It is recognized in Eurasia, but not yet in the maritime states. For the maritime states, it must be a time of revived sea and air power.

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III

The Rôle of Strategic Infrastructure in the Rise and Fall of Civilizations

By Andrew Pickford

T Angkor Wat, Rome, and New York are separated by thousands of kilometers and centuries between when they were the predominant global centers of power. Fundamental in their rise, and decline (Angkor Wat and Rome), was the extent to which strategic infrastructure remained a priority of their leaders.

Prioritizing strategic infrastructure becomes more and more challenging over successive decades and centuries. As the initial benefits are forgotten, it becomes politically advantageous to defer new capital investment and then defer and neglect operational expenses. After a period of underfunding and neglect, strategic infrastructure reaches a point when it makes financial sense to abandon it and seek new options. This often results in the decline of a society and reversal of urbanization which, in turn, has a nega-

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tive impact on innovation, life expectancy, and the cohesiveness of a society.

At present, electrical power systems constitute strategic infrastructure. In Rome, it was aqueducts. In Angkor Wat, it was canals. All of these classes of strategic infrastructure compress time and space, as well as improve the material wellbeing and health of citizens. They facilitate abstraction and specialization.

This paper will consider the importance to modern societies of the electrical power systems. It will review the lessons from Rome and Angkor Wat and the strategic infrastructure which enabled these civilizations to flourish.

In considering electrical power systems, the key strategic infrastructure of the 21st Century, faddish approaches to energy security will be replaced, instead, with the holistic tool of “strategic analysis”— as described by Dr Stefan Possony in the 1970 classic, *The Strategy of Technology*⁸ — and be employed to answer questions relating to our own civilization and the part the electrical power systems play in our society.

What is Energy Security?

The quantitative stock-take of hydrocarbons — most prominently conducted by British Petroleum in its annual publication⁹ — has come to dominate discussion in what is mistakenly referred to as “energy security analysis”. Despite the near-religious belief in the use of these statistics, counting proven and probable reserves of hydrocarbons does not reveal major trends in the electricity sector. Similar exercises of documenting trees and whales, when they were key

8 Possony, Stefan T., and Pournell, J. E.: *The Strategy of Technology: Winning the Decisive War*. Cambridge, Mass., USA, 1970: University Press of Cambridge Dunellen.

9 The BP annual *Statistical Review of World Energy* covers a range of energy sources, however, it is extremely linear in its focus and serves as a historical stock-take rather than a forecasting tool.

fuel sources, did give a short-term view of the availability of a particular fuel source; however, it could not, and does not, provide a window into the future. The counting of hydrocarbon reserves, and treating it as the main driver of security, overlooks the reality that energy systems and processes continuously evolve to meet the needs of society. Similarly, while adding up trees and whales would have provided tactical-level intelligence at the time, it would not have been helpful in forecasting new technologies and fuel sources, or understanding the overall strategic direction of energy.

Like the fetishes of quantitative data points, a number of analysts get caught up in a belief that “the next big thing” or paradigm shift is just around the corner.¹⁰ This usually leads to a view that conventional thinking no longer applies or is relevant. In the financial sector this manifests as booms which inevitably lead to busts.¹¹ The advocates of paradigm shifts nearly always gloss over the fact that societal needs for energy services have not changed much in the past few millennia. Mankind’s ability to apply new technologies and achieve greater efficiencies has been *the* variable which determines current and future energy services. From historical analysis it is evident that improvements to efficiency and adaptation of existing technologies have had a far greater immediate impact than a particular new discovery or innovation. Accordingly, focusing on the direction of incremental improvements, rather than breakthroughs, can lead to better understanding of long-term trends.

Fulfilling societal needs and a desire to find better tools can be seen as akin to a cavemen looking to build a bigger fire; shopkeepers seeking a brighter oil lamp with a longer

10 See in particular Chapter 22, “Victory’s Unique DNA”, by Gregory R. Copley, in *The Art of Victory*, New York: Simon & Schuster’s Threshold Editions, 2006, and discussion about “the next big thing”.

11 For a very good review of the cyclical excesses and normalcy of the business cycle, see Carmen M Reinhart and Kenneth S Rogoff, *This Time is Different: Eight Centuries of Financial Folly*, Princeton, NJ, 2009: Princeton University Press.

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wick; and a power authority opting for a new and more efficient nuclear plant. This evolution from fire to a briefcase-sized nuclear battery is critical to understand, as it is part of a continuous trend. The overall trend of improved and cheaper energy services¹² has been one of the main drivers of human development.

Despite the rôle of energy services in 2011 — which are primarily delivered through stationary electricity generation plants — its largely linear, quiet and uneventful expansion over the past five decades has masked its importance. Conversely, oil shocks and blockades have seen strategic literature almost exclusively focus on liquid fuels availability and maritime choke points. Besides the fact that the borders between transport and stationary technologies and fuels are blurring, this undervalues the major rôle which electrical power has in the success or failure of societies.

Electrical Power System Definition

While the focus of this chapter is on stationary electrical power, it is important for the electrical power system to be defined. An electrical power system, in its broadest sense, begins at the physical site of the extraction of the fuel source and finishes at the use of electrical power in an end use appliance or process. Many interim steps are required to convert the energy, move it from the site of generation to consumption, and make it suitable for use.

This paper will use the following simplified definition for an electrical power system:

Fuel source > Generation site > Generation > Transmission > Distribution > End use appliance/process.

12 Economists have led research in this area by focusing on the needs of energy services rather than energy itself. The demand for energy services such as heat, power, transport and light allows analysis across centuries. It does not preclude pre-Industrial Revolution information, in which the provision of wood or coal for heat is viewed as an energy service.

Electrical Power System Analysis

While there has been significant work on the strategic, economic and political importance of oil — most famously by Daniel Yergin in *The Prize*¹³ — electrical power is only considered as an afterthought. There are a number of valid reasons for focusing on liquid fuels, which are needed for transport. Without them, tanks, aircraft, ships, and other forms of military vehicles would simply not function. Electrical power systems generally have more substitutes; from coal, hydro, nuclear and increasingly wind and solar. Perhaps one of the main reasons of the neglect of analysis of electrical power systems is that they remain such a complex system which only specialized electrical engineers really understand, and that there has not been an equivalent Suez crisis or 1970s style oil shock. Electricity blackouts remain of interest to the engineering community and voting public, but are only generally considered a human-interest, domestic news story.¹⁴

As context is critical for truly understanding an issue or topic, the study of electrical power systems is an integral part of strategic analysis. However, any attempt to find contextual reviews of electrification and its ongoing development is a challenging exercise.¹⁵ Despite being one of the

13 Daniel Yergin, *The Prize: The Epic Quest for Oil, Money and Power*, New York: Free Press, 2003.

14 Jaime Holguin, “Biggest Blackout In US History”, CBS News, August 15, 2003, at www.cbsnews.com/stories/2003/08/15/national/main568422.shtml [accessed October 14, 2010].

15 Hausman, Hertner and Wilkins’s recent work is one of the few substantial studies which examine the history of the electricity industry’s maturation on an international scale. The study takes a multidisciplinary approach in analyzing how international finance and multinational enterprise intersect in the globalization of power systems. Three eras of power development are delineated from the late 1800s; initially marked by privatization and minimal foreign ownership, increasing domestication from the early 1900s, and a shift away from government control with multinational involvement from the 1970s. The study demonstrates electricity’s fundamental place in modern society and emphasizes the interplay between polity and economics in the industry’s development. See William J. Hausman, Peter Hertner, and Mira Wilkins: *Global Electrification: Multinational Enterprise and International Finance in the History of Light and Power, 1878-2007*, New York:

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world's largest industries, few works by professional historians stand out, and most recent studies are dominated by an over emphasis of popular notions relating to climate change. The lack of serious work in this area makes it more difficult to understand the direction of the industry, as legacy infrastructure and standards play such an important rôle in future developments. The building of massive electrical projects after World War II is particularly poorly covered which proves problematical as this stock forms the majority of most electricity assets in existence today. Understanding the expansion of post-World War II systems in the then USSR and People's Republic of China (PRC) is a critical part of the puzzle, as they were among the few non-Western nations to develop nuclear power independently from the West.¹⁶ From extensive reviews of public libraries and private utilities, very little public material exists on these topics. Publications in the West mainly consist of non-critical, company commissioned histories, or narrower studies which do not consider the rôle of electricity in the broader society.

The other locations in which expertise and understanding of electrical power issues should reside is strategic studies departments in universities and independent think-tanks. However, in general, these organizations rarely research or analyze electrical power systems as a discrete field of study. The reasons for this are varied and could be related to the lack of technical and engineering skills within these institutions. Another driver could be that the field of humanities mostly produces strategists who do not practice in the field and who are generally unfamiliar with electrical engineering.

In what is increasingly termed “homeland” or “domes-

Cambridge University Press, 2008.

16 David L. Morton, Jr, “Reviewing the History of Electric Power and Electrification”, *Endeavour*, Volume 26,(2), 2002.

tic” security, the protection and hardening of critical infrastructure are treated as a technical or engineering exercise which enters into consciousness only after a physical attack or natural disaster. Before September 11, 2001, this was a much lower order issue. The elevation of cyber warfare and an interest in smart grids¹⁷ may reverse this phenomenon¹⁸, yet without technical skills or multi-disciplinary collaboration, there is not the depth to provide comprehensive analysis. An informal survey by this author revealed little expertise and limited publication in strategic studies on electrical power systems.¹⁹ Pockets of expertise exist in intelligence agencies, but they tend to rely on technical analysis and reviews of new technologies from academic engineering departments and private utilities for their own work.

Despite limitations of literature and expertise, and analysis of a wide range of electricity references, an independent review and broader analysis by this author of power systems shows much continuity. This broader approach helps to contextualize disruptive trends which could have significant strategic implications. Continuity and availability of electricity — directly or indirectly — can determine change

- 17 Smart grids refer to technologically superior, decentralized, and complex power networks which facilitate more efficient and reliable electricity generation, transmission and distribution between localized points of entry and national networks. These intelligent, self-sufficient network control systems (smart grids) could offer benefits of real time management of electricity distribution and adjusting flows in response to peak load impacts, interruptions in generation or transmission, and redistributing electricity accordingly in order to achieve a more efficient power system. Smart grid technologies have the potential to integrate localized renewable generation sources and storage units into power grids, as well as facilitating greater consumer-grid interaction and mitigating excess physical infrastructure additions.
- 18 A much quoted and limited exception is: Siobhan Gorman, “Electricity Grid in US Penetrated By Spies”, *The Wall Street Journal*, April 8, 2009.
- 19 Extensive searches in strategic literature for “electrical, grid, or power security” revealed minimal publications. Inquiries to the London-based International Institute of Strategic Studies and Canberra-based Strategic and Defence Studies Centre at the Australian National University, revealed no current expertise on the topic and little previous work. One of the few exceptions was two papers written by Eben Kaplan at the US-based Council on Foreign Relations in 2007. However, these papers are very brief and contain little research or insight not already available through mainstream media and trade magazines.

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of governments and cause revolutions in developed as well as undeveloped nations. Keeping the lights on, and subsidizing their use, is very similar to the Roman practice of providing “bread and circuses”²⁰ centuries earlier. Once a regular service is introduced and common place, then accepted as a minimum standard, the populace views such services as a right. Political leaders which fail to deliver the 21st Century equivalent to bread tend to experience short periods in government, however, at present, they do not meet the same fate as their Roman predecessors.

Continuity

It is remarkable how much continuity there has been in electrical power systems over the past century. The period of innovation and battle over standards in the US during the 1880s and 1890s was relatively short. Once settled, the framework and fundamentals of electrical power systems, have largely remained the same ever since. This is partly attributable to the fact that electrification spread during one of the high-points of globalization which matched the dominance of the Anglo-American influence. Accordingly, early projects had very similar standards and methodologies, locking nations into a particular development path. Other nations subsequently followed suit and found from external technical expertise and equipment purchases, that it was easier and cheaper to adopt existing systems than to attempt a different approach.

From a long-term view of energy services, electrification is a relatively new phenomenon commencing in Western Europe and New England. This industrial shockwave continues to reverberate across the world. With each burst of growth and extension of electricity, scale and size increase,

20 Bread and circuses is derived from the Latin term *panem et circenses* and refers to the Roman practice of putting on circuses and distributing bread to win support from the populace. Accordingly, it is viewed as a metaphor for a superficial means of appeasement.

yet fundamentals remain the same. The comparison of the 1896 Niagara Falls hydro scheme and the Three Gorges project in the PRC reveals much continuity.

In 1893, Westinghouse Electric was hired to design a system to generate alternating current (AC) on Niagara Falls, which is located on the US-Canadian border. The result was the world's first large AC power system which commenced operation on August 26, 1895. In 1896, underground conduits, leading to turbines generating upwards of 75 megawatts, were sending power as far as Buffalo, 32 km away which, at the time, was a significant distance. In a more contemporary example is the Three Gorges Dam which spans the Yangtze River by the town of Sandouping, located in the Yiling District of Yichang, in Hubei province of the PRC. At present, it is the world's largest electricity-generating plant of any kind. The original project was completed on October 30, 2008, when the 26th generator in the shore plant began commercial operation. Each generator has a capacity of 700 megawatts, with an aggregate capacity of 18,200 megawatts.

Despite the Three Gorges project being almost 250 times larger than the original Niagara Falls plant, it is in many ways less revolutionary. Certainly the PRC project is an engineering marvel, however, it benefits from a century of improvement and expansion of hydro-plants both in size and complexity. While larger, it follows the same basic approach of Niagara Falls. In contrast, the Niagara Falls project was a major advancement from previous electricity generation developments when first built. Similarly, across the vast bulk of electrical power assets — while larger and now computerized — the fundamental building blocks remain constant. Because of this continuity in basic infrastructure design and configuration, an electrical engineer from 1910 would not require much explanation in order to under-

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stand how the 2011 power grid operates.

Reasons for Continuity

The reasons for continuity in electrical power systems can be broken down into three main categories. These drivers are important as they explain why there has been such continuity, despite scale changing, and will be incredibly influential for the coming decades of power system development. They include:

- 1. Unchanging human needs for energy services;
- 2. Legacy standards;
- 3. Legacy infrastructure.

Unchanging Human Desires

Human need for warmth, cooling, and light, as well as interest in improving lives has not changed over a number of millennia. Greater efficiency and improved utilization, driven by practical, economic factors, are not unique to the 21st Century. However, they have accelerated during this period due to a confluence of scientific and societal changes. In combining analysis of the efficiency of technologies as well as fuel, and their costs, a clearer picture emerges.²¹ From reviewing the long-term price of energy services, it has been established that the fall in the price of services is far greater than indicated by the price of the fuel (this generally relates to efficiency gains and capital/operational expense mix). This pattern implies that human desires and long-term energy service costs are far more important than transitory fuel price availability for determining trends.

When considering energy services, rather than simply electricity provision, the demand for cheaper and cleaner

21 Roger Fouquet and Peter Pearson, "Long Run Trends in Energy Services, 1300-2000", in *Proceedings of Environmental and Resource Economists 3rd World Congress*, Kyoto, January 2005.

service offerings is better understood. Modern environment demands can subsequently be placed in context. Decarbonization was first driven by the practical requirement for clean air and was well in place before the environmental movement began. It all began once the first fire required stoking, and smoke filled the eyes of those seeking warmth. Advocating for coal plants to be placed further and further away from urban centers was a continuation of this early trend. In 2011, we are simply continuing along this same path. Nevertheless, those advocating faster decarbonization today are less concerned with the practical issues associated with carbon emissions and instead focus on broader political motives relating to de-industrialization and the curtailing of what is seen as “unsustainable” Western lifestyles, wasteful of energy.²²

Legacy Standards

Aside from constant human desires, design parameters, or standards of energy services, are important. Standards follow the logic of the day which often corresponds to the needs of the innovator in a particular time and place. To the confusion and frequent bewilderment of engineers, society does not always select the most logical and efficient standard or platform. For example, Beta video cassettes were technologically superior to VHS, yet VHS came to dominate and be the default consumer video cassette standard. Accordingly, once standards are set, they are unlikely to change (until the next major disruption). This in turn contributes to the accumulation of what can be called legacy infrastructure based on these standards which will be considered in the next section.

Modern writers usually use the example of Roman chariot width and its influence on contemporary infrastruc-

²² This is most clearly seen in the ideology of extremist environmental political parties and green movements across the world.

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ture. Chariots were built for the realities of the day, which was horsepower and horse size. Roads and trains followed these standards due to the significant stock of Roman infrastructure which outlasted the Empire. Railway width in the US followed the English standards. As a result of these historical developments, it has been claimed that the size of the US Space Shuttle big booster rockets attached to the sides of the main fuel tank are influenced by Roman standards. These solid rocket boosters, made by Thiokol at a factory in Utah, need to be transported via rail, through rail tunnels, to reach the assembly point. As the rail width determines the tunnel width, there is said to be an arguable link between Roman chariot standards and the US Space Shuttle. While debatable, it shows the impact of initial standards.

The electrical power system is now ubiquitous. Yet, in the early period of development and innovation, a number of parameters were set which form the basis for modern standards. Many of these decisions were very arbitrary. An initial battle between Alternating Current (AC) and Direct Current (DC) saw AC become the dominant transmission standard (although DC is re-emerging with breakthroughs in technology). The frequencies of AC generators — the number of oscillations per second of the AC output — have varied widely, ranging from 16.67 hertz to 133 hertz. The common standard in countries today is either 50 or 60 hertz, with Japan uniquely using both frequencies in different parts of the country. This was an early standard war in which the end result was not a logical point, but the result of competitive processes. Once set, it became the basis for all power systems.

Looking more broadly at the design and expansion of the AC electrical power system over the 20th Century, it is the large, remote generation plant, with high voltage transmis-

sion moving electricity to load centers, which has been the favored planning approach. To a significant degree, this is the preferred model worldwide. Fuel sources and generation types tended to follow initial availability of suitable rivers for hydro or location of coal for thermal power. More recently, nuclear and gas generation have had their own location and user preferences, but this has largely been influenced by the now established power systems.

Legacy Infrastructure

In a very similar vein to legacy standards, physical placement of infrastructure echoes down the ages. These are often based on defense and strategic requirements which subsequently have broader societal uses and applications. For example, Roman roads and the US internet network were both built for defense requirements and then became useful vehicles for commerce. In many cases, with refurbishment, Roman aqueducts were still in use long after the end of Empire and the Roman road system in Britain has left a permanent footprint. Once an expensive asset is built, there is strong temptation by future societies to keep utilizing it, even when a newer technology comes along, simply because of sunk costs and vested interests in keeping it functioning.²³

In the case of the electrical power system, the placement and continuation of some now very old generation and transmission assets, entering their sixth decade of use, remain central to existing systems. Their legacy, as well as sunk costs, dominates current approaches to the energy system. The legacy infrastructure itself becomes a platform

²³ Asset valuations and cash flow rely on extension of the status quo. A change to the approved or regulated framework will cause an asset price crash which means that asset owners throughout history have lobbied political decisionmakers to restrict new entrants. This experience in the fixed line telecommunications system has seen traditional providers lose value due to mobile solutions serving the same need and rendering the existing infrastructure useless.

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which can be enhanced to perform its original task more efficiently and reliably or sometimes fulfil an entirely new task altogether. The service of the US Air Force B-52 *Stratofortress* bomber has gone through a similar transformation. While the platform itself will be around 90 years when it retires, the significantly upgraded aircraft will perform rôles unforeseen at its creation.²⁴ However, applying new technologies to old infrastructure is not always possible. In terms of generation plants and electricity networks, particularly in Western nations, legacy infrastructure casts a long shadow over current thinking; locking in linear approaches to designing and building new assets. Interestingly, developing nations, without legacy infrastructure, can design electrical power systems from scratch; this has resulted in a subsequent faster deployment of new technologies.

The 2010s: Disruption or Continuation?

In the 2010s, within Western nations, there is a debate over the future of electrical power systems primarily due to aging assets reaching the end of their life as well as societal demands for “cleaner and greener” energy. In many cases, this means upgrading existing infrastructure and incrementally adding wind farms and solar panels. This is not greatly changing the basis or foundations of the electrical power system. So-called smart grid technologies which involve greater monitoring, data flow, and remote operation have been said to be a major disruption. However, as of 2011, the prevailing industry view is that the benefits of smart grid applications do not outweigh the costs. Earlier hype of these technologies has given way to an expectation that, like the internet, the application of “Web 2.0”²⁵-type

24 Similarly, it has been observed, Viscount Nelson’s flagship, HMS *Victory*, was 40 years old when it led the Royal Navy to victory over the French and Spanish fleets off Cape Trafalgar in 1803.

25 The term “Web 2.0” refers to web applications which facilitate information sharing, interoperability, user-centered design, and collaboration. It generally is associ-

smart grid solutions will provide more substantive change than the initial mania. Similar to the experience of the internet, this may result in significant, useful applications being rolled out towards 2020, with expensive and not particularly consumer friendly services dominating the first part of the 2010s.

Compared with 2011, the early electricity generation systems had very little capacity and are viewed by many modern electrical engineers as primitive. It is forgotten that these early systems often replaced much more primitive energy services such as wood fires. This major transition is hard to convey, especially to those who believe in the superiority of current technologies. A narrow quantitative focus, comparing megawatts of power installed in 1910 to 2011, does little to explain the major transition which occurred.

In a broader analysis of the electrical power system and society, it could be said that the period from 1930 to the 1980s represented an artificial break in the private, innovator-led model of the industry. Stalin in the USSR and Pres. Franklin Roosevelt in the US — through a desire to industrialize and the New Deal policies respectively — both implemented a model of power system planning and operation which was highly centralized, dominated by the government and viewed as a tool of development.²⁶ This was state-driven and directed, even if in private hands, and was led by technocrats who favored central generation, linear expansion of a constantly expanding industry and limited change or restructuring.

ated with the emergence of practical applications and commercial services that were adopted by consumers and provided profit opportunities contrasting to the unfounded dot.com boom that was based on over optimistic forecasts and asset valuations. These services did not radically alter the basic platforms, but made them usable and consumer friendly.

²⁶ Before this, the industry was dominated largely by entrepreneurs and experienced a higher rate of competition and innovation.

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Due to this historical legacy, and the specialized technical skills required to complete such tasks, the senior management of electrical power entities across the world has traditionally been dominated by engineers. The reason for the dominance of engineers in senior rôles within utilities both in the US and USSR entities was due to the post-World War II boom, economic expansion and agreement of how the “commanding heights”²⁷ of the economy should be structured and run despite Cold War differences. This period saw a rapid expansion in all forms of electricity assets following a general consensus on the central planning approach which was laid out in the 1930s.

Challenging the existing structure of the electrical power system which was established during the 1930s would be difficult. The 1970s oil shocks were important and were soon followed by cheap, plentiful oil. Despite their immediate impact, over the long-term, a temporary shortfall of oil did nothing to alter the foundations of planning and operation of the electrical power system.²⁸

Likewise, while heralded at the time as revolutionary, the corporatization and privatization trends of the 1980s and 1990s did not fundamentally alter the structure of the industry, just ownership patterns. Much of the centrally planned, engineering-led approach prevailed, even if not as obviously as earlier. So why did the oil shocks not lead to serious change?

Turning Point? 1970s Oil Shocks

The Oil Shocks of the 1970s were a supply side shock in which a cartel restricted the output of a critical fuel source. It created chaos and inflationary pressures, and the price

27 This term was coined in a 1922 speech by Vladimir Lenin. It symbolized the principle that, in the name of economic development and national security, it was critical for government to control key economic sectors, such as steel making and transportation, as well as electricity.

28 France and its shift to nuclear power was one exception.

increases forced a re-evaluation of energy policies which led to substantial policy innovation. Many view this time when the industry was turned on its head in relation to personal experiences of waiting in queues for fuel or experiencing associated job losses. This helped governments craft truly strategic energy policies.²⁹ Nevertheless, by the 1980s these policies gave way to political considerations. Policy makers displayed little appetite to implement unpopular energy reforms a few years after the actual shortages, and convinced themselves that it was an aberration and not the rule. Overall, there were some changes to macro-energy policy settings, but the following trends limited their longevity:

- The price movement of oil was a shock that was driven by restriction of supply, and not structural;
- Computing power and IT were expensive and still emerging, limiting the policy proposals of the day which made reference to Smart Meters and Smart Grid applications;
- High levels of “blue sky” Research and Development investment was short-lived;
- Internal Western politics of the 1980s and the growing environmental trend shifted attention away from strategic energy plans which were quickly forgotten or deemed too expensive; and
- The low oil price in the 1980s allowed a return to business as usual approach.

Whereas the initial response to the oil shocks started to produce genuine strategic thinking and a longer-term view towards energy services, a number of these factors made it easy to revert back to previous approaches which were dominated by linear, narrow thinking. Also, within the cab-

²⁹ For example, the Australian state of Western Australia produced a profound, long-term energy policy in 1979, yet it was ignored in the 1980s and during the review of state energy policy in 2010, it was all but forgotten.

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inet and executive level policy making sphere, energy became much more of a lower order issue. As deregulation and the emergence of the finance sector accelerated, electricity assets and new energy services were seen as what became known during the dot.com boom as “old-economy”. In this process Enron represents this financial, rather than energy, trend, as it mainly sought to manipulate and exploit distortions in newly liberalized energy markets more than to innovate and augment energy technologies. However, Enron’s collapse and the California electricity crises at the beginning of the 2000s, did lead policymakers to think about energy at a head-of-government level.

2010s: A Period of Transition Points?

There were a number of forces at play as the second decade of the 21st Century began; forces which were starting to shift the overall nature of energy services and the sub-set of the electrical power industry. While caution should be taken in applying terms such as “paradigm shift”, the interaction of the below trends may start to facilitate a partial break with existing practices. Due to greater national competition and the reverse of globalization — exemplified by increasing trade barriers and greater restrictions of the free flow of capital, labor and goods — the expected coalescing and break up of nations may mirror the experience of power systems.³⁰ The manifestation of this trend will require a suite of new and newly applied technologies which has the potential to significantly change the sector, even if it is still based on post-World War II physical platforms. During the 2010s, a number of trends stand out which will drive the nature of the electrical power system:

► Computerization, data storage and manipulation are

³⁰ While globalization is declining, the supply chain for energy remains global. Roman aqueducts collected water from perhaps tens or hundreds of kilometers, but disruptions could be handled on a relatively local basis. Now fuel sources are thousands of kilometers away and are much more vulnerable.

now cheap, ubiquitous and accessible off the shelf;

- ▶ The convergence of telecommunications, electricity infrastructure and technologies will impact on the performance of assets, while enabling automated grid management and greater consumer involvement. Digital applications which control grid operation via the Internet (such as supervisory control and data acquisition systems) promise to augment grid utility through improving electricity efficiency and continuity. Concurrently, however, these advancements amplify grid vulnerabilities to external penetration and operational disturbances which will require increasingly sophisticated security mechanisms;
- ▶ Transport and stationary energy is beginning to overlap with electrical cars and compressed natural gas cars competing across and between industries;
- ▶ A possible return to a service model for electricity facilitated by increased energy prices, aging network infrastructure, miniaturization, storage options. (In essence, a vendor sells a service³¹ such as heat or light as Thomas Edison initially structured contracts in the 1880s and 1890s). This could result in a cyclical return to atomized power distribution;
- ▶ Continental interconnections and micro-grids are both now technically feasible and attractive economic options which could be used for political aggregation or atomization. Expansive transmission networks are becoming more feasible, especially with the development of high voltage direct current (HVDC).³² This allows for

31 Whereas in analog grid systems, where utilities charge customers based on periodic meter readings of static electricity prices, cost reflective, real time pricing will allow for electricity to be billed specifically based on how much was used and when. This will be facilitated by smarter technologies which enable utilities to track electricity usage in real time and charge accordingly in response to when energy prices rise and fall, as well as interactive digital meters which relay real time electricity rates to customers.

32 HVDC is already used to transport electricity between Germany and Sweden via an undersea cable and has the potential to link northern Africa's substantial solar

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regional connectivity between nations, and even inter-connectivity at a continental level in order to transport large quantities of power at low voltages, while minimizing losses;

- ▶ Concern about environmental issues is rising, yet no clear indication of consumers wanting to individually pay for “cleaner” alternatives is obvious, implying that the environmental movement and demands may be very different by 2020;
- ▶ Innovation in non-Western nations is beginning to set industry standards and benchmarks, most notably seen in the PRC’s expansion of its electricity grid.³³ With an imbalance between energy distribution and consumption, the PRC is undertaking advanced projects to optimize its energy structure. For instance, the Jiangsu system is being upgraded with 500 kilovolt high impedance transformers which, if installed, would significantly increase the power supply capacity to meet growing urban load demands. Such power system advancements are generating domestic expertise and increasing non-Western dominance in international asset manufacturing markets, which previously was limited to developed nations. The PRC’s \$10-billion deal to supply India with coal-fed turbines³⁴ exemplifies the growing trend of developing nations conducting business amongst themselves, while simultaneously reducing the global market share of traditional, Western electricity equipment ex-

capacity to European markets under the Mediterranean.

33 For example, the 1,000 kilovolt Ultra High Voltage (UHV) transmission demonstration project in the People’s Republic of China (PRC). This project began as a review of various historical studies which the State Grid Corporation of China used to begin its own research and development on more than 200 key technologies such as voltage standards, electro-magnetic environment, overvoltage and insulation co-ordination, lightning protection, high altitude, heavy pollution, large power grid control and voltage control. Tinbiao Shu, “A Milestone in Global Power Industry: Chinese UHV AC Demonstration Project Commence Operation”, *Electra*, No 242, February 2009, pp 4-7.

34 James T. Areddy and Paul Glader, “China grabs \$10bn Indian power equipment deal”, *The Weekend Australian*, October 30-31, 2010, p 31.

porters;

- Where there are minimal legacy infrastructure standards and assets, developing nations are increasingly at the forefront of grid design and management. The application of improved grid components and alternative maintenance methods allows them to partially bypass inefficient designs, with the potential of accelerating national electrification and development. One example of this is the deployment of pre-paid electricity meters throughout nations on the western coast of Africa.³⁵ While the hardware faces physical challenges from electricity theft, the process of reading the meters yields viable revenue. This has consequently instigated specialization and is attracting investment and stimulating market expansion. As grid advancements within developing nations gain momentum, the significance of regulation will tend to diminish as innovation becomes increasingly directed by consumer choice.

The impact of these trends is not yet clear. Nevertheless, the direction which this sector takes will be dependent on a number of successive societal choices. Historically, strategic infrastructure cannot be de-linked from the fate of the society which builds it. Electrical power systems are required literally to keep the lights on and cities functioning. Without electrical infrastructure, New York would only be able to sustain a fraction of its population and the benefits of specialization and abstraction would quickly dissipate.

Societal Choice

At their core, provision and maintenance of critical infrastructure, such as electrical systems, are derivative of societal choices. Electricity infrastructure is not unique. Despite Rome, Angkor Wat, and New York being separated by centuries and thousands of kilometers, a common feature runs across all cities. Over time, the use, deployment and

³⁵ As of 2009, these countries included Senegal, Guinea-Bissau and Ghana.

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structure of electrical power systems, reflect the successive choices which a society makes. This class of strategic infrastructure includes aqueducts leading to Rome, the Angkor Wat canal complex in Cambodia or the New England electricity grid connecting New York. These major and complex infrastructure projects allowed societal abstraction. They facilitated an improvement in quality of life through provision of fresh water, the availability and movement of food and electrical power. This, in turn, allowed high levels of urbanization, specialization and the flowering of human civilization. However, to maintain these benefits, the infrastructural systems required continued upkeep, repair and maintenance, as well as expansion. In modern parlance, they need funds for capital expenses and operational expenses. Without this investment, the infrastructure can deteriorate and fall into ruin.

Largely through the work of Jared Diamond, and his influential publication, *Collapse: How Human Societies Chose to Fail or Succeed*³⁶, analysis of the decline of societies is viewed through the prism of determinist ecological decline. The more subtle message — which is overlooked in the age of climate change alarmism — is the way in which a society can choose its own destiny and maintain the production of surplus resources to sustain and expand critical infrastructure. Typically, when a civilization flourishes, it builds new network infrastructure which compress time and space, as well as improve the material wellbeing and health of its citizens. This includes food, fresh water and, today, electricity. Justifying continual expenditure on these networks over the generations is difficult, as is the desire to defer upgrades and maintenance for short-term political imperatives. The experience of Rome³⁷ and Angkor Wat

36 Jared Diamond: *Collapse: How Societies Choose to Fail or Succeed*. New York, 2005: Viking Press.

37 Michael Assante, “Infrastructure Protection in the Ancient World”, *Proceedings of*

serve as examples of how critical infrastructure can experience vulnerabilities and decline.

One of the most significant innovations in Roman civilization was the aqueduct system which facilitated extensive urban development, societal progress and the transformation of Rome into an empire. While initially built underground for practical and security purposes, the aqueducts were soon incorporated into the city's architectural grandeur. Shifting the infrastructure placement also ran parallel with a growing sense of security from external invasion. The aqueducts' capacity in transporting water over large distances was fundamental to increase Rome's population and extend its urban periphery, with a total of 11 aqueducts eventually constructed. However, without the requisite maintenance and physical protection, their vulnerability as a means to disrupting social life and dislocating commerce were eventually realized through Germanic attacks. Over time, this rendered the system decrepit and unreliable.

Similarly, the Angkor Wat complex in Cambodia, now believed to have flourished between the Ninth and 16th centuries as one of the most extensive pre-industrial settlements, was reliant on a vast water management network to sustain and grow its population.³⁸ A complex system of reservoirs and canals collected, stored, and distributed fresh water to agricultural and suburban areas. This allowed greater interconnectivity between, and service to, cumulative residential settlements and sites of food production. Over more than half a millennia, this single operational system became essential for the main urban Angkor Wat settlement, stretching approximately 1,000 square kilometers to serve a developing agricultural base beyond the

the 42nd Hawaii Conference on System Sciences, 2009.

38 Damian Evans, *et al.*, "A comprehensive archaeological map of the world's largest pre-industrial settlement complex at Angkor, Cambodia", *PNAS*, vol. 104, No.36, pp 14277-14282.

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central temples.

The sheer size and magnitude of Angkor Wat's infrastructure system was profound in shaping urban patterns, which in turn, demanded fundamental shifts in social organization. However, some of the changes which facilitated the development of the canals have also been attributed to its decline. In designing and maintaining Angkor Wat's water management system, land was cleared for cultivation and water resources exploited which generated environmental degradation, food shortages and over-population along the canal banks. These constant disruptions exacerbated design weaknesses in the system leading to its decline and predicated Angkor's collapse. Both the Angkor Wat water network and Roman aqueduct examples are instructive of the influence which societal choice exerts in determining how critical infrastructure can either propel societal development or, if neglected, facilitate in its decay.

Conclusion

Several lessons can be gleaned from the historical experience of critical infrastructure which remains applicable to electrical power systems. These lessons include:

- ▶ Over time, infrastructure which improves quality of life — and allows urbanization and societal abstraction — becomes fundamental for that society to continue functioning. What may originally be intended to increase the ease of completing daily tasks soon becomes integrated into societal operation, as determined by collective social choice. Systems which increase the circulation of basic human necessities (food and water), improve standards of living and support population growth, which in turn enables innovation in production techniques and specialization, and induces societal dependence;
- ▶ Removing or disrupting the infrastructure does not lead to minor setbacks, but major societal dislocation. When

common reliability on a system is established, the ramifications of infrastructure decline — either through disrepair or external interference — are substantial and may shift societal structure along with its evolutionary direction;

- ▶ The impact of legacy standards and legacy assets means that once infrastructure is built, it is seldom replaced or changed. Once standards have been defined by prevailing societal needs at the time of infrastructure deployment, the development of superior system components or minor vacillations in design trends will, for the most part, fail to seriously disrupt the system. High costs of replacing assets and challenges associated with physically reorganizing the infrastructure also prolong its longevity;
- ▶ When new technology is incorporated into existing infrastructure, it can introduce vulnerabilities and weaknesses;
- ▶ The threat perception of the security environment drives the incorporation of security features in infrastructure design and once the environment is deemed safe and low risk, the concern for incorporating security features diminishes further. Rome's changing design of its aqueduct system is especially illustrative of this. While there were initial concerns over attacks from Italian tribes at the city's periphery, the initial aqueduct was hidden in reflection of the perceived security risks. As the Romans' defense strengthened, their borders expanded and the external threat was perceived to be weakening, concerns over the infrastructure's vulnerability faded. At that point, the fundamental utility of the infrastructure was transformed to augment the city's aesthetic prestige;
- ▶ New regulation and mandates seeking to deal with security flaws and maintenance requirements without necessary investment will not guarantee security or long-term viability;

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- ▶ Ignoring maintenance and repair, as well as neglecting to adopt long-term changes to the security and physical environment into asset management considerations, means that infrastructure can reach a point where there is a logic in abandoning it or shifting to new regions.

As applied to power systems:

- ▶ Change in power systems always appears to be evolutionary, but more often than not, this is overstated;
- ▶ Assets have 50+ years of service life and need to factor in changes to the security environment;
- ▶ Legacy infrastructure standards will influence many of the decisions, but developing nations are free from many of these constraints;
- ▶ Regulations and government dictates are going to be increasingly redundant due to consumer preferences and innovations which are going to be driven by developing nations.

IV

Integrating the Eurasian Landmass as an Energy and Strategic Zone

*From broad-brush historic mega-trends to
imperative concrete regional undertakings*

By Yossef Bodansky

T G B S B (GBSB)
— the region between the middle of the Adriatic Sea in the west and the middle of the Caspian Sea in the east, between the Russian landmass in the north and the Turkish-Persian landmass in the south — is a vital hub of the Eurasian energy network, and, for that reason, is fast becoming Europe's latest tinder-box.

Although traditional geographic textbooks identify the borderline between Europe and Asia as the line stretching westward along the water-crest of the Caucasus Mountains and then arching southward through the center of the Turkish Straits and then hugging the Greek littoral westward, the legacy of the Cold War and the dissolution of the

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Soviet Union put the entire GBSB within the confines of Europe's geopolitics and geoeconomics.

Hence, the rapidly boiling cauldron which the GBSB has become is first and foremost Europe's challenge.

And it is Europe's — specifically, the EU's — failure to confront and resolve the crux of the crisis that makes the GBSB Europe's latest and potentially most dangerous tinder-box.

Throughout history, the singular global significance of the GBSB has lain in the frictional overlapping of north-south and east-west mega-trends. It is the recent developments in these mega-trends which aggravate the grand strategic posture in the GBSB.

The Historical Framework

North-south dynamics started in the middle of the 15th Century when the Russians started pushing the Mongol-Turkic hordes southward in a series of wars, while the Ottoman Armies occupied Constantinople, bringing an end to the Byzantine Empire, and started their advance northwards along the shores of the Black Sea all the way to Crimea. The north-south mega-trend crossed an historic milestone in the early 17th Century when the Cossacks' raids spread along the northern shores of the Black Sea (today's Ukraine) and culminated toward the end of the Century when the armies of Peter the Great first reached the shores of the Black Sea (Sea of Azov to be precise).

During the 18th and 19th Centuries, Russia fought a series of bitter wars with both Turkey and Persia which determined the southern borders of the Empire until the end of the 20th Century, as well as consolidated its claim to a special — if unwelcome — rôle in the Balkans. As well, Russia fought the main European powers of the day — England and France — in the mid-19th Century on the shores of the

Black Sea in order to legitimize Russia's pre-eminent rôle as a regional power. Throughout the Century, Russia also continued to suppress rebellions and insurgency in the Caucasus. Russia's aggregate posture endured throughout the turbulent 20th Century: both World Wars and the ensuing Cold War.

East-west dynamics can be traced back to the mid-Second Century BC, to the first recorded origins of the Silk Road which facilitated China's initial reach out to Europe via Persia. In its original form, the Silk Road was consolidated some 300 years later, in the mid-Second Century AD. The more modern character of the Silk Road can be traced to the mid-13th Century, the civilizational transformation of Eurasia in the aftermath of the Mongol invasion of Europe, when the Silk Road expanded and gradually evolved into a comprehensive system of exchange of both goods and culture between East and West. Alas, the east-west dynamics were largely frozen out during the second half of the 20th Century as a byproduct of the Cold War.

At the dawn of the 21st Century, and to a lesser extent even in the last decade of the 20th Century, these historic mega-trends were revived and assumed their dominant rôle in geopolitics and geoeconomics. These revivals came with a new twist befitting the monumental changes that took place in the aftermath of the Cold War.

Global history, as Sir Halford Mackinder articulated around the beginning of the 20th Century, has largely evolved as an interaction between the pivotal heartlands and the littoral states. The civilizational history of the Eurasian landmass since ancient times has been dominated by these dynamics. In this respect, the Cold War was a minuscule yet traumatic 40-year long interlude in human, particularly Eurasian, history.

Indeed, the aftermath of the Cold War has been domi-

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nated by a global intense drive to return to the traditional dynamics largely guided by the principles articulated by Mackinder. However, the end of the Cold War also left the United States — the quintessential littoral state — as the self-declared and self-anointed sole hyper-power demanding a preeminent rôle in the Eurasian heartlands. And that US intervention disrupted the Eurasian return to its socio-political heritage and thus engendered the anomalies at the root of the currently brewing crises throughout the heartlands, including the GBSB.

Significantly, the United States — the perceived “bad guy” in these developments — is *not* an evil empire. The US is hardly an empire. The US is a well-intentioned although misguided global power. As a young country and the product of a unique human melting pot, the US has no institutional perception of history, heritage, and long-term megatrends. The quintessence of US politics is both driven and dominated by domestic-interests. The US is therefore, by choice, an isolationist power.

However, its immense economic power necessitates global interaction to facilitate the huge volume of commerce required to keep its domestic-economic process working. At the same time, being the quintessential anti-empire, the US does not consciously seek to control others and chart their course. The global grand-strategic objective of the US has always been to disrupt others from joining forces and carrying out activities which might be detrimental to the contemporary and domestic-economy-driven interests of the US. This can be achieved by either lavishly and generously helping local peoples and powers pursue their interests in manners complementing the US' interests of the day, or by ruthlessly and heavy-handedly coercing peoples and powers to change their ways if their actions are deemed contradictory to the US interests of the

day. There are neither US long-term objectives, nor consideration and awareness of other peoples' long-term objectives, traditions, heritage, desires and destinies.

Thus, during the Cold War, the primary objective of the US was to contain the Soviet Union; that is, disrupt the ascent of the USSR so that it could not interrupt the ascent of the US as a global economic powerhouse succeeding the West European colonial powers. A major instrument of this policy was to shield Western Europe from Soviet hegemony.

This was achieved brilliantly under a US umbrella — the NATO Alliance — but without preventing the recovery of Western Europe from transforming into the inherently anti-US regulatory nightmare which the EU has become. As well, starting in the early-1970s, the US bribed the People's Republic of China (PRC) into disengaging from the Soviet Union in return for economic modernization and empowerment, but without influencing or preventing the ensuing Chinese chauvinistic awakening which now dominates China's global posture and behavior.

On a smaller scale, at one time or another when it suited its short-term purpose, the US allied itself with, and lavishly sponsored, vehemently anti-US *jihadi* forces, be they in Afghanistan, the Northern Caucasus, or the former Yugoslavia. Similarly, Washington's preoccupation with the here-and-now presently determines the US policies and activities in the GBSB, thus making the US a catalyst for instability.

Meanwhile, shaking off the vestiges of the Cold War aberration in the 1990s, the three historic powers of the pivotal heartlands of Eurasia — Europe, Russia, and the PRC — have begun to posture and maneuver in a quest to resume their historical rôles in a somewhat different modern world; a world torn between localized legacies and the

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globalized economy and information revolution.

As well, for the leading Eurasian powers, there existed a common vital threat: the ascent of the radicalized and empowered militant Sunni Islam. Long dormant and suppressed by the imperial powers, the trend was awakened by the Muslim world's inability to cope with the spread of Westernized modernity. The Muslim world eagerly adopted the technological advances originating in the West, but was frustrated in its desperate effort to shield Islamdom from the civilizational values which accompanied these technologies.

Contemporary *jihadism* was inadvertently empowered and exacerbated by the United States as the aggregate and unintended result of the overthrowing of the Shah of Iran, the facilitation of the Pakistani-supported anti-Soviet *jihad* in Afghanistan, the tolerance of the Saudi worldwide export of neo-*salafism*, and the decimation of traditionalist-conservative Arabism in the course of the Gulf War of 1990-91.

Consequently, in the last decade of the 20th Century — the fledgling first decade of the post-Cold War era — the three historic powers of Eurasia had a common vital threat to unite them even before all other profound issues that separate them could push them apart.

In the GBSB, Moscow sought to contain and prevent the revival and surge of Sunni *jihadism* into Russia's own soft underbelly via Central Asia and the Caucasus. The continued *jihadist* insurgency in the North Caucasus serves as a constant reminder of the challenge and the imperative for strategic solutions. As its wont, Russia did so by surging southward once again. This time, however, Russia's key instruments were strategic-diplomatic rather than military.

The Kremlin's number one priority has now become the empowerment of, and cooperation with, Turkey and Iran:

the local forces which have ethno-national heritage as great powers, even if anti-Russian. For Moscow, the strategic *rap-prochement* with modern-day Persia means that Shi'ite Iran serves as a wedge separating the Sunni-Arab cauldron and the Afghan-Pakistani cauldron, thus preventing the formation of a *jihadist bloc* capable of surging northward.

Similarly, the Russian alliance with Turkey serves to slow and stall the spread of Arab neo-salafism and *jihadism* into the Caucasus and the Balkans. Russia is neither oblivious to, nor supportive of, the Islamist radicalism and regional aspirations of both Iran and Turkey. However, their non-Arab character serves as a barrier against the significantly greater threat of neo-*salafism* and Arabization. As well, the look southward revived the Russian presence in the Balkans where the US intervention in, and mishandling of, the collapse of Yugoslavia resulted in, among other things, the consolidation of *jihadist* presence and grass-roots Muslim radicalization.

In retrospect, the collapse of the Soviet Union which ushered in the end of the Cold War did not happen as a result of a US or Western victory. The collapse of the Soviet Union was the outcome of self-inflicted self-destruction which, in turn, ensued from the Soviet rediscovery — under duress and in immense frustration — of its Russian heritage and roots. The profoundly religious Mother Russia could no longer co-exist with the atheist communist Soviet Union; and eternal Mother Russia prevailed. And with this triumph there revived the manifest destiny of Moscow as the Third Rome: the successor of Rome and Constantinople as the guardian and leader of the civilized world.

The Kremlin has thus rejuvenated Russia's imperial surge southward along historic routes and directions, albeit now more via hegemony than the traditional occupation by force. Nevertheless, Russia's is still an expansionist surge

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in quest for dominance. It is therefore only a question of time before Russia's current preventive surge will evolve into a quest for imperial-style hegemony.

Meanwhile, the main mega-trend undertaken by the EU after the fall of the Berlin Wall was to surge eastward in order to gradually integrate the European states left behind the Iron Curtain. By 2007, the EU reached the shores of the Black Sea. Concurrently, the EU has also reached out for a new coexistence with the eastern reaches of Europe; that is, with Russia and the former Soviet states. The EU's main surge eastward has already resulted in the consolidation of the EU-RF (Russian Federation) common "Eurasian Home" policy, a process which is for the first time making Mackinder's pivotal heartlands a viable grand-strategic reality. The EU has also embarked on a host of derivative programs; most notably the Eastern Partnership initiative which covers six former Soviet states on the periphery of the EU, five of which are GBSB countries.

However, important as the EU's advance eastward and the Eastern Partnership are, they are not the dominant elements of the EU's policy and challenge in the GBSB.

The principal factor dominating the east-west mega-trend is the EU's reaction to, and coping with, the strategic and economic ascent of the PRC, and particularly China's renewed surge along the Silk Road. The economic miracle which facilitates the reawakening and ascent of the PRC is fueled by hydrocarbons. The PRC is now a major importer of hydrocarbons, and the primary sources are the Persian Gulf and Central Asia. While the PRC is diversifying its sources of hydrocarbons by shifting attention away from the Persian Gulf to Africa's Gulf of Guinea, the singular importance of Central Asia and the Caucasus as China's source of energy keeps growing.

Central Asia and the Caucasus are also the West's own

Persian Gulf of the 21st Century. In the coming decades, the importance of the hydrocarbons reserves of Central Asia for the EU will keep increasing as supply from the Persian Gulf will decrease due to dwindling reserves and growing political instability.

According to the EU's own data, the EU's energy dependency will climb from 50 percent in 2000 to 70 percent in 2030. The EU's commitment to renewable energy sources will not affect this dependency because the majority of the sources of electricity from solar and wind power will also be outside the EU, albeit in allied countries such as Morocco rather than unstable regions such as the Persian Gulf and Central Asia.

Oil imports are expected to rise from 45 percent of the EU's consumption in 2000 to 90 percent in 2030. Although natural gas imports are expected to rise from 70 percent of the EU's consumption in 2000 to 80 percent in 2030, the component of Russia, the Caucasus, and Central Asia is expected to double from 40 percent of the total imports to 80 percent (in the event that Nabucco could fully facilitate a flow of gas from Iran and Iraq, the component of Russia, the Caucasus, and Central Asia would only decrease to 60 percent).

Significantly, despite the EU's firm commitment to power generation from renewable energy such as solar and wind power by 2020-2030, this will not reduce the EU's dependence on hydrocarbons for transportation and household heating and cooking; issues that are directly affecting the average citizen.

The main reason for the dramatic slowdown in the energy diversification is because the coattails of the still-unfolding economic crisis will make it impossible to replace the entire oil and gas infrastructure, household appliances, and fleets of vehicles in the foreseeable future. Simply put,

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not only can the EU not afford the huge public works and personal changes of habits required to make energy diversification a reality, but the EU must encourage all job restoration programs even if they are in energy inefficient and polluting industries. Therefore the EU's dependence on the importation of hydrocarbons will continue to grow in the coming decades.

In the triangle of conflicting interests in Central Asia and the Caucasus between Europe, Russia, and China (PRC), Russia would rather see the hydrocarbons going westward to Europe. However, Russia and the local states are primarily interested in economic empowerment and the ensuing popular stability. Therefore, the inclination of all local governments is to permit the PRC to carry eastward whatever hydrocarbons cannot be shipped westward to Europe.

Herein is the crux of the east-west face-off affecting the GBSB. Simply put, for Europe to have a reasonable chance to get the energy it needs from Central Asia and the Caucasus, it must dominate a stable GBSB.

Contested Entities

The parts of the GBSB which need to be addressed here are the three mini-states and one contested entity of the Southern Caucasus, and the dozen or so states and contested entities of the Balkans and adjacent Ukraine.

These states and entities are squeezed between Russia in the north and Turkey in the south. As well, the pipelines carrying hydrocarbons from Central Asia (and Russia) to Europe pass through them (and Turkey). The inherent contradiction between the indigenous reaction in these states and contested entities to the mounting pressure created by the north-south mega-trend — namely the building cooperation, and even alliance, between Russia and Turkey and Iran — and the EU's quest for stability (virtu-

ally at any cost) are the harbingers of the building crisis in the GBSB.

Except for Greece, the countries of the GBSB were part of the communist world during the Cold War. And while Romania, Yugoslavia, and Albania adopted their own distinct paths, breaking away from the Soviet-imposed communist orthodoxy, they nevertheless remained dictatorships with communist-style ideology. During the 1980s, the populations of both the Balkans states and the periphery of the Soviet Union were increasingly influenced by the revival of the quest for self-identity based on, and derived from, ethnical and religious roots and heritage. It was a grassroots reaction to the intensified Sovietization, and especially the growing Russification within, which was exacerbated by the US and NATO “captive nations” propaganda unleashed by the US Reagan Administration. The concurrent spread of fledgling Islamist theology — supported for various reasons by the strange coalition of Iran, Saudi Arabia and Libya — found a fertile niche among the otherwise secularized Muslim population of the region.

By the time the Berlin Wall fell, the entire GBSB was strewn with a web of myriad ideologies-theologies which sought to adopt extremist and maximalist trends as the solution for preserving the self-identities of small ethno-nationalist groups. These small groups felt threatened by the historic waves crashing all around them; by the sudden and drastic changes to the world they had known for at least half-a-century.

The aggregate impact on the reigning confusion, uncertainty, and economic misery (to the point of hunger and poverty) was a widespread clinging to messianic extreme ideologies-theologies in a quest for divine panaceas. In the process, the communist-dictatorial glue which had held states and nations together — the fear of the centralized

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state's "forces of darkness" — was gone and replaced by an explosive combination of near-anarchy, popular fearlessness and the revival of historic enmities and rivalries. These were exacerbated by the contemporary competition for scarce resources — most notably food, energy and employment — in the dysfunctional entities that replaced the crumbling communist states.

In 1990-91, the US led the West to focus on the Iraq-Kuwait crisis because of its centrality to Persian Gulf energy safety. In so doing, the West was missing the "Golden Hour" for addressing the unraveling of the Soviet periphery. The US was inclined to give Germany a free hand in the Balkans in order to get the US Army out of Germany and deploy to Saudi Arabia for the assault on Kuwait. Another outcome of the US focus on the Gulf War and the resources invested in it was the sudden rise and spread of global satellite TV news which, in a few years, was to drastically affect the political-military handling of the crisis in the Balkans.

Meanwhile, Moscow's "Last Hurrah" in the South Caucasus would end up influencing the US post-Cold War policy in the entire GBSB. The incident took place on the sidelines of the then-rapidly escalating war between Armenia and Azerbaijan. In May 1992, Azerbaijan appealed to Turkey for help as Armenian military forces occupied Nagorno-Karabakh and neighboring areas in Azerbaijan, and threatened the Nakhichevan exclave.

In response, Turkey's President Turgut Özal threatened to invade Armenia. In the coming days, Turkish and Armenian forces traded artillery fire and Turkey rushed significant reinforcements to the area. Moscow reacted with fury, convinced that Ankara was carrying out Washington's and NATO's instructions. Moscow put the Russian forces in the Caucasus on alert and started troop movements toward Turkey.

Marshal Yevgeniy Shaposhnikov warned of the dire ramifications of war against “Turkey and the United States” should Turkey come to the assistance of Azerbaijan. US intelligence learned that Russia was considering a “demonstrative strike” against the US radar near Kars, eastern Turkey, in case Turkish military crossed the border of either Armenia or Azerbaijan. The mere existence of these threats convinced Washington that the GBSB, and the ex-Soviet periphery as a whole, were not worth the risk and cost of a renewed confrontation with Russia. The US policy would now focus on exploiting and capitalizing on events in the GBSB in order to further US causes of higher priority with total disregard to the implications and ramifications in the GBSB itself.

In the 1990s, the United States capitalized on events in the Balkans for exactly such reasons.

Initially, the US-led Western intervention in the former Yugoslavia was aimed first and foremost to salvage NATO (and with it US dominance over post-Cold War Western Europe) from irrelevance and collapse. As well, the support for the Muslims of Bosnia became the counter-balance of the US confrontation with *jihadism* in the Middle East. Anthony Lake, US President Bill Clinton’s National Security Adviser, formulated the logic for the US-led intervention on behalf of the Muslims. The US national interest “requires our working to contain Muslim extremism, and we have to find a way of being firm in our opposition to Muslim extremism while making it clear we’re not opposed to Islam. If we are seen as anti-Muslim, it’s harder for us to contain Muslim extremism. And if we stand by while Muslims are killed and raped in Bosnia, it makes it harder to continue our policy,” Lake argued. That in the process the US would end up partnering with, supporting and arming, the very same *jihadist* forces Clinton was seeking to contain

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meant nothing to Washington. The only thing Washington cared about was the image of a US rallying to the rescue of a Muslim cause.

But the US intervention in the former Yugoslavia was more than just unilateral and arbitrary use of force in the name of humanitarian interventionism. The US would end up enshrining the legitimacy of a policy based on flagrant lies, as well as demonizing the Serbs and the world of Eastern Christianity as a whole.

The global strategic outcome of the wars in the former Yugoslavia was determined to a great extent by the images on satellite TV news and the implication of US support and endorsement. Thus, the sight of a quarter of a million Serb refugees being evicted from Krajina with the blessing of the US-led West, of ruined churches, and of Serbs digging out the coffins of their dead for the long travel, touched a raw nerve among all of Eastern Christianity. Similarly, the sight of blond, blue-eyed Bosnian commandos saying Muslim prayers in Arabic before embarking on their missions against Christian forces not only reinforced the sense of a global *jihadist* identity and cause throughout a diverse Muslim world under the spell of neo-*salafite* charities and preachers, it also sent isolated and historically-defined communities into greater isolation and defensive militancy out of fear of succumbing to the Arabization propagated by the neo-*salafite* charities and preachers.

Meanwhile, the old-new wars of the Caucasus continued to rage outside the West's attention span.

A myriad of wars and mini-wars kept escalating and spreading, bringing back to life long-dormant conflicts and hatreds. It took the exhaustion of the prostrate and impoverished post-Soviet population to end the carnage in the mid 1990s. A host of ceasefire and political co-existence agreements were signed under Moscow's watchful eye. But

there was haste and impatience to bring an end to the carnage as soon as possible. And the leaders involved, all well-meaning former officials of the backward Soviet periphery, knew nothing of the intricacies of international law and agreements. The legacy of these shortcomings would, and still does, haunt the region. Ultimately, by then, the genies of hatred and separatism were out of the bottle.

It was in mid-1994, with fratricidal violence subsiding, that Azerbaijan signed the “Contract of the Century” with a consortium of Western companies and ushered in the era of hydrocarbons and pipelines from the GBSB. Unscrupulous Western businessmen dragged Western oil giants into the region promising huge and quick profits. These politically well-connected oil giants, in turn, dragged in the US and West European governments in the name of protecting their investments and commercial interests.

In the process, corporate officials engaged in deal making with local powers and leaders they thought could deliver energy and routes for pipelines, as well as block those of competitors, all in total disregard of genuine legitimacy and local circumstances. The US led the Western governments to bless these deals for their commercial value, thus aggravating the already explosive situation. Most important, the initial Western intervention ended up empowering localized leaders and aspirant leaders, and their fringe ideologies, at the expense of viable political entities throughout the Caucasus.

The regional posture was aggravated by the US intervention in local crises in pursuit of energy transportation interests.

The US Clinton Administration developed a penchant for attempts at forcing an outcome through local crises instead of patiently working with all sides toward a compromise or a negotiated solution. Frequently, the US interven-

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tion was motivated by domestic-political considerations irrespective of the regional posture and dynamics. This approach was also pronounced in Washington's repeated efforts to have both oil and gas pipelines between Azerbaijan and Turkish Mediterranean seaports constructed by US corporations rather than European-dominated international consortiums.

In Spring 1997, the US capitalized on the brewing crisis between Armenia and Azerbaijan.

The most significant development in the crisis took place somewhat away from the Nagorno-Karabakh front line. In late April 1997, Armenia moved some of its R-17E SCUD-B surface-to-surface missiles (SSMs) closer to its border with Azerbaijan. The Armenian SSMs were deployed in operational positions from which they threatened strategic objectives in Azerbaijan, mainly the country's key oil and gas infrastructure. The Armenian redeployment and targeting of the Azerbaijani infrastructure were in violation of the SSM procurement agreement with Russia according to which the SSMs were supplied solely as deterrence against Azerbaijani attack on Armenia itself.

However, at the instigation of the US Armenian-American Lobby, the Clinton Administration elected to side with and shield Armenia in an effort to sway Armenia away from Russian influence. Consequently, the US aggravated the regional tension, creating false expectations in Stepanakert and Yerevan, and hardening the positions of all sides involved.

Armenian officials in both Yerevan and Stepanakert still cling to the promises made by US officials in mid-1997 even though subsequent official and formal clarifications of US policy negate the 1997 off-the-cuff promises.

By 1999, the US had given up on reconciling Azerbaijan and Armenia in order to construct pipelines to Turkey, and

instead Washington started focusing on building pipelines via Georgia.

For such a project to be economically viable, the Russian pipelines would have to be shut down. Hence, in early October 1999, senior officials of US oil companies and US officials offered representatives of Russian “oligarchs” in Europe huge dividends from the proposed Baku-Ceyhan pipeline if the “oligarchs” convinced Moscow to withdraw from the Caucasus, permit the establishment of an Islamic state, and close down the Baku-Novorossiysk oil pipeline. Consequently, there would be no competition to the Baku-Tbilisi-Ceyhan pipeline. The “oligarchs” were convinced that the highest levels of the Clinton White House endorsed this initiative. The meeting failed because the Russians would hear nothing of the US proposal.

As a result, the US determined to deprive Russia of an alternate pipeline route by supporting spiraling violence and terrorism in Chechnya, as well as tacitly reinforcing the political fallout of media accusations of Russian war crimes. The Clinton White House sought to actively involve the US in yet another anti-Russian *jihad* as if reliving the “good ol’ days” of Afghanistan, Bosnia-Herzegovina and Kosovo, seeking to support and empower the most virulent anti-Western Islamist forces in yet another strategic region.

In mid-December 1999, US officials participated in a formal meeting in Azerbaijan in which specific programs for the training and equipping of *mujahedin* from the Caucasus, Central and South Asia, and the Arab world were discussed and agreed upon. This meeting led to Washington’s tacit encouragement of both Muslim allies (mainly the intelligence services of Turkey, Jordan, and Saudi Arabia) and US “private security companies” (of the type that did Washington’s dirty job in the Balkans while skirting and violating the international embargo the US formally sup-

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ported) to assist the Chechens and their Islamist allies to surge in Spring 2000. Citing security concerns *vis-à-vis* Armenia and Russia, Azerbaijan adamantly refused to permit training camps on its soil.

Meanwhile, in 1995, the Clinton White House started threatening Serbian leader Slobodan Milošević that the US would adopt the “cause” of the Kosovo Albanians in order to coerce Belgrade to support the US-mediated Dayton Accords.

To add pressure on Belgrade, US and NATO intelligence services began sponsoring Kosovo Albanian terrorist and insurgency networks even though they were intimately connected to *jihadist* terrorist forces from the Middle East, Afghanistan-Pakistan and Bosnia-Herzegovina under the command of Muhammad al-Zawahiri (Ayman’s brother), as well as to drug dealing and human smuggling networks. By early 1999, the situation was getting out of hand, and in March NATO found itself going to war in support of organized crime gangs and Osama bin Laden’s declared allies. The predominantly US aerial bombing of Serbia lasted between March 24 and June 10, 1999. The war was justified on the basis of claims of crimes against humanity that in the aftermath of the war would prove to have been false and intentionally manufactured. For example, on April 19, the US State Department officially warned that “up to 500,000 Kosovo Albanians were missing and feared dead”. However, in July 1999, KFOR discovered some 2,150 bodies in Kosovo and only about 850 were considered “victims of war crimes”. In August 2000, the International Criminal Tribunal for the Former Yugoslavia (ICTY) confirmed that a total of 2,788 bodies were exhumed in Kosovo.

Washington knew this all along but the Clinton Administration had no better reasons or excuses for going to war. In reality, the Clinton White House was afraid of the

marginalization of the US by an EU which was questioning the wisdom of setting the Balkans aflame. And so the US dragged a weak, indecisive EU into a needless war once again on the basis of data and arguments the US already knew to be false. The war ended in a series of US-imposed agreements and UN resolutions which certified that Kosovo was an integral part of the then Federal Republic of Yugoslavia but also granted the population of Kosovo NATO-guaranteed autonomy. The autonomous status of Kosovo and the territorial integrity of Serbia were reiterated by UN Security Council Resolution 1244. (Europe's revenge — the result of both the humiliation of being fed intentionally false intelligence and of being dragged into unilateral war — would be painful for the US. The European skepticism would return with a vengeance in 2002-03, manifested in the European hostility toward the US' Iraq adventure.)

At the beginning of the 21st Century, official Brussels knew that the EU was incapable of putting down the fires at Europe's periphery on its own. The closing down of the Danube as a vital transportation link because of US bombing of bridges and dropping of unexploded munitions from the attacks on Serbia hit home hard, just as the importance of the energy supplies from the East was beginning to grow. Consequently, Russia, with tacit EU support, attempted to reverse the trend by reaching out to select allies in both the Balkans and the Caucasus in order to bring them to recognize the existence of a Russian umbrella in addition to NATO's. Russia also developed special relations with Greece, including the first direct weapons sale to a NATO member, especially a veteran one. Most important was the beginning of Russia's dramatic historic *rapprochement* with Turkey.

The fledgling Russian-West European cooperation

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alarmed the United States, mainly for economic reasons. The big oil and engineering/construction companies, always politically influential in Washington, feared that the new era of cooperation would soon expand into developing and exploiting the vast energy resources of Central Asia — from hydrocarbons to hydroelectricity — and the huge energy transportation infrastructure which was to be constructed through the GBSB.

In the closing days of the Clinton Administration, a group of politically influential, liberal-leaning financial giants sought to capitalize on the new carnage in order to gain foothold in the tormented Balkans ostensibly in the name of spreading human rights and democracy. Subsequently, the Bush White House — mesmerized by its own “democratization” propaganda, as well as eager to placate the energy and construction giants which suffered from the destruction of Iraq, and the residual Cold Warriors among the Washington élite (who resented the Administration’s focusing on the War on Terrorism instead of reviving the Cold War) — agreed to support and even expand the Clinton Administration’s interventionist policies.

The policy was implemented in the form of the “Color Revolutions”: December 2000 in Serbia, November 2003 in Georgia, December 2004 in Ukraine, and March 2005 in Kyrgyzstan (Central Asia’s main source of hydroelectricity). These “Color Revolutions” not only made a mockery of the US commitment to genuine democracy, but exploited the most primordial divisions in these still immature and unstable states by pitting minorities against majorities and by using street chaos to empower politicians considered pliant to US *diktats*.

Ultimately, in so doing, Washington was further undermining both respect for the Western values of governance and statehood, as well as deepening the ethno-centric and

nationalist sub-state disputes and mistrust.

Washington's strongest commitment was to Georgia, the spigot of the transportation of hydrocarbons to Europe. The US had long considered the control over the pipelines in Georgia the panacea instrument to both neutralizing Russia's ascent as an energy power-house and forcing a hostile Europe into subservience through energy dependence. Politically, this was a safe bet for the besieged and maligned Bush Administration because it brought support from the Democrats who invented the concept. However, there were practical problems to overcome. The main challenge was the absence of port facilities for the pipelines as the seaports controlled by Tbilisi were already overloaded (the construction of the BTC pipeline started in 2003 and would not be completed until 2006). The most suitable port was in Batumi, which Washington also sought as an outlet for the railway from land-locked Armenia in order to wean Armenia away from the Iranian embrace.

But there was a tiny problem. Batumi is in Adjara, one of the three autonomous regions sponsored by Russia since the end of the Georgian civil wars in the early 1990s. (The other two autonomous regions were South Ossetia and Abkhazia.)

After the Rose Revolution, and encouraged by Washington, Georgian Pres. Mikhail Saakashvili pledged to crack down on separatism in Georgia. In Spring 2004, Tbilisi instigated a major political crisis and threatened to use force in order to impose its authority on Adjara. The Bush White House interceded with the Kremlin, supporting Saakashvili's ultimatums but also guaranteeing that the new Georgian laws would redefine and expand the terms of Adjara's autonomy. On the basis of explicit US guarantees, in March 2005, Moscow compelled the Adjarian leaders to reach agreement with Tbilisi and promised to vacate the

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Russian military base in Batumi. Russia evacuated the base in November 2007, more than a year ahead of schedule. However, Tbilisi quickly reneged on all promises for autonomy and forcefully “integrated” Adjara into Georgia in all but name.

Throughout, Washington repeatedly interceded with Moscow, blunted the Russian criticism of the violation of the signed agreements, and provided cover for Saakashvili.

Little wonder that Saakashvili became overconfident and started to make additional demands on the Russians regarding South Ossetia and Abkhazia.

Tbilisi demanded that Moscow make unilateral concessions in violation of the 1994 agreement which had ended the Georgian civil war. When Moscow dared to raise the violations of the 2005 agreement on Adjara as reasons for Moscow’s apprehension, Tbilisi rallied Washington’s forceful intervention in Moscow. The US also shielded Georgia’s increasing brazen provocations, including flying drones into Russian territory and sending patrols deep into South Ossetia and Abkhazia. In Spring 2008, when the Russian military ran a major military exercise — KAVKAZ-2008 — in the North Caucasus, the US exerted tremendous pressure on Russia to return all the participating units back to their bases in the heart of Russia so that they could not serve as a threat to Georgia. Russia complied in May 2008.

In the political negotiations, however, Moscow held ground and refused to consider any additional unilateral concessions until the outstanding Adjarian issues were resolved. Hence, by the time politics got deadlocked, Saakashvili had already painted himself into a corner and created expectations of “liberation” as the counterbalance for economic crisis and erosion of democratic rights. Saakashvili had every reason to assume that no matter how outrageous his provocations might be, the Bush White

House would cover for him at the Kremlin. This perception led to the Georgian attack on South Ossetia in early August 2008, triggering the Georgian-Russian war.

Russia emerged as the clear winner.

The Kremlin demonstrated that Russia was the undisputed regional power, and that Russia had the resolve and military means to intervene in order to secure its vital interests. The Kremlin resolved to further consolidate Russia's strategic posture as the dominant and indisputable power in the entire GBSB.

The Kremlin kept the regional power-projection posture running from the new strategic headquarters in Vladikavkaz. This HQ was tasked with the consolidation of the long-term, undisputed Russian strategic dominance over the greater region, not just with the mere crushing defeat of future Georgian provocations. That crushing defeat of the US-sponsored Georgian armed forces by relatively small Russian forces spoke much of both the capabilities of the Russian Armed Forces in the Caucasus, as well as the quality and value of US-sponsored military assistance. The Kremlin proved that the US was incapable of challenging this grand strategic ascent, and that the EU was willing to go along with this maneuver.

The entire Georgia conflict, and particularly the strikes on energy facilities, were quickly highlighted by some EU leaders and very senior security officials as evidence that Russian regional hegemony was the key to Europe's energy security.

For official Brussels, the war provided the ultimate proof of the US disregard for the vital economic interests of the EU. At the same time, the US had been putting immense pressure on Europe to adopt "alternate" — that is non-Russian — sources of energy (even at the cost of tolerating Turkey's joining the EU) and give-up on supplies from Iran.

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The US facilitated the flaring-up of the volatile Caucasus just to avenge Moscow's staunch and not-unwarranted opposition to the unilateral independence of Kosovo.

Washington's willingness to endanger European vital interests in pursuit of the minor issue of Kosovo pushed the EU over the top in adopting an overall hostile attitude toward the US.

In the long-run, the most disastrous outcome of the Russian-Georgian War of August 2008 was the unilateral declaration of independence of South Ossetia and Abkhazia, which Russia had to accept against the Kremlin's better judgment and the self-interests of Russia. Because of its own separatist-secessionist crises in the North Caucasus and the diversity of its overall population, Russia has long been opposed in principle to separatism-secessionism and especially its unilateral realization. Indeed, as a co-chair (along with the US and France) of the OSCE Minsk Group empowered to mediate a resolution of the Nagorno-Karabakh Conflict, Russia was the most insistent and forceful in opposition to granting independence to the Armenian enclave in Nagorno-Karabakh, and in favor of preserving the territorial integrity of Azerbaijan. This position pitted Yerevan — a close protégé of Moscow — against Moscow.

Thus, for Russia, the unilateral declaration of independence of South Ossetia and Abkhazia, even if under the duress of Georgian aggression, created a quandary the Kremlin was eager to avoid.

However, it was the US policy in the Balkans — namely, facilitating the unilateral declaration of independence of Kosovo in February 2008 — which compelled Russia to recognize the unilaterally-declared independence of South Ossetia and Abkhazia.

Formally, the Kosovo declaration of independence was an act of the Provisional Institutions of the Self-Govern-

ment Assembly of Kosovo which declared Kosovo to be independent from Serbia. That the Kosovo declaration of independence was in violation of specific US-imposed international agreements and United Nations Security Council (UNSC) resolutions did not matter to Kosovo's key supporters. This was an inevitable end to nearly two decades of US pro-Muslim and anti-Serb interventionist policies in the Balkans. Given the extent of the US commitment over the years, it was only a question of time and political expediency before the US rammed through Kosovo's independence. Thus, Kosovo's independence could not and would not have taken place without the all-out endorsement and support of the Bush White House, particularly the advance guarantees to Priština that the US and its key European allies would immediately recognize the new "state" and deter Serbian intervention.

The US "excuse" that the 2008 vote was under duress, and given the failure of various UN-sponsored mediation attempts, made no sense since Serbia did not threaten to reverse the EU- and NATO-guaranteed *status quo*. Moreover, any unilateral move did not warrant the flagrant disregard for international agreements and UNSC resolutions. Similarly, the US insistence that Kosovo was an extenuating circumstance and thus did not constitute precedence was not believed by anybody, least of all official Washington itself.

Hence, in the aftermath of the US-led diplomatic blitz sanctifying the unilateral declaration of independence of Kosovo there was nothing the Kremlin could say to South Ossetia and Abkhazia, particularly given the still fresh record of the violation of the US-sponsored deal on Adjara.

The incoming (2009) US Barack Obama Administration barged into the volatile GBSB with vengeance in early 2009.

Significantly, the Obama White House is even less committed to foreign policy and strategy than previous Admin-

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istrations. However, the vast majority of key positions in the US foreign policy establishment, starting with the Secretary of State, are held by veterans of the Clinton Administration who are first and foremost determined to ensure that their legacy and reputation remain intact.

These circumstances have concrete implications for the GBSB. For example, how can Washington coerce countries to enter into a new Dayton-style agreement in order to expedite the US withdrawal from Afghanistan when the original Dayton Agreement is falling apart? On top, there grows the political commitment to the influential liberal-leaning financial giants who originally instigated the “color revolutions” and other “human rights” and “democratization” programs, as well as their numerous protégés in high positions: all of them extreme leftist liberal activists. Taken together, these personnel policies make for an explosive combination for the US’ friends and foes alike.

Russia’s preeminence in the EU energy market also became clear during 2009. The EU was smarting from the Russian-Ukrainian “gas war” of the previous winter when Ukraine held Europe’s heating hostage to a payment dispute with Russia; namely, Ukraine’s attempt to either have Russia forgive Ukraine’s huge debt for gas used in Ukraine or coerce the freezing EU to pay Ukraine’s debt and bills. The EU came out of the crisis most alarmed by the bottleneck where (until Nord Stream is constructed) some 80 percent of Russia’s gas was being transferred to the EU through Ukraine.

Brussels’ ultimate decision to side with Moscow despite huge pressure from Washington to support Kiev sent a message to the gas suppliers of the Caucasus and Central Asia. Most significant was the October 14, 2009, agreement between Russia and Azerbaijan for the annual sale of an initial quantity of 500-million cubic meters of natural gas,

with an option for doubling the quantity. The essence of this agreement was that Azerbaijan was now relatively free of its dependence on the safety of the pipelines via volatile Georgia while Russia now controlled the further export and transportation of the Azerbaijani gas to Europe. An important byproduct of this agreement is that Baku lost confidence in the viability of Nabucco as an export outlet for its gas.

By late 2009, official Brussels was cognizant of Europe's growing dependence on hydrocarbons from the east, and the realization that the main threat to supplies was not the producers — Russia and its allies — but the US-allied transit states, Georgia and Ukraine. Gunther Oettinger, the incoming EU Commissioner of Energy, was not anti-Russian (like his predecessor) and was therefore more open to facing reality. In early 2010, the EU launched important changes, such as a declared willingness to support South Stream, which was now expected to enter the EU most likely in Romania. This policy change amounted to the EU virtually abandoning Nabucco, at least until a viable southern route, via Armenia rather than Georgia, was secured and the Azerbaijan-Turkey price dispute was resolved.

In contrast with Nabucco, South Stream was a concrete project, and in 2015, by the time it was to go on line, its capacity would be four times the anticipated initial capacity of Nabucco and twice the potential capacity if Nabucco was fully upgraded. A late 2009 performance comparison study conducted for France's EDF concluded that "South Stream outclassed Nabucco 'by four to one'". Jacques Deyirmendjian, the former President of Gaz de France International, stressed that "in the collection of howlers in the gas industry, the idea of building a gas pipeline without having found the gas which it will transport is the primordial error".

In early March 2010, Oettinger articulated the EU's new

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energy security policy. The EU's priority was to free itself from the Ukrainian bottleneck rather than disengage from Russia as a dominant supplier. Hence, the EU would support the construction of a multi-venue southern corridor which could include South Stream, as well as Nabucco, if they meet the EU's energy security criteria. "The European Union's priority is clear. We want to develop the southern corridor. The European Union wants a direct connection to the Caspian and the Middle East region," Oettinger explained. Therefore, the EU "will not ... stand in the way of South Stream".

He went further, stressing that "South Stream could be backed by the European Commission on condition that it meets the technical requirements for security". Oettinger also highlighted the insufficient capacity of the existing transit network to meet the EU's medium and long term demands. Ensuring the availability of more transit venues was a problem more urgent than "diversification", he stressed. "South Stream will increase the capacity for gas imports [to the EU] and set up a new infrastructure supply network," Oettinger explained. In the longer term, "Nabucco will not only boost supply capacity but it will also bring new suppliers to Europe, increase diversification and independence".

The Economic Threats

The GBSB was still, in 2011, under the shadow of unprecedented economic collapse. All the economic measures were negative with no indication of a major improvement in sight. Even the economy of energy-rich Azerbaijan was in bad shape. The collapse of the Greek economy — the most developed among the GBSB states — threatened to shake the entire Eurozone monetary system.

The majority of the region's economies are dependent to

a great extent on the flow of foreign salaries, investment, and aid, and these are increasingly in short supply because of the lingering crisis. Moreover, these problems will continue and exacerbate long after the richer states of Western Europe and Russia begin to pull out of the crisis. This is because a major facet of their economic recovery will be profound modernization of the labor market, resulting in long-term large-scale unemployment, which, in turn, will result in widespread rejection of foreign workers in Western Europe. This trend will have a double impact on the economies of the GBSB, both depriving them of the flow of *euros* from expatriates, and sending these rejected workers back to their home countries where they will add to the number of unemployed.

The compounding impact of these trends all but ensures that there is no end in sight for the economic crisis in the GBSB.

These severe economic problems engender and have long-term socio-political ramifications for the entire GBSB. The aggregate impact of this myriad of socio-economic problems is the aggravation of the political stability along ethno-centric lines. As the economic crisis intensifies, and misery and despair spread, greater segments of the population will try to find solace in the fold of sub-national and ethno-religious identities. It is very tempting for people in distress to cling to beliefs that their plight is rooted in a communal discrimination by a hostile majority. As crises linger on, these sentiments transform into fertile grounds for further grassroots exacerbation and radicalization.

This minority awakening tends to have a ripple effect which aggravates instability and hostility beyond the directly-affected areas. The ascent of the Kosovo Albanians led to the suppression of the Serb minority in Kosovo in the form of desecration and bombing of historic churches and

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monasteries, as well as widespread violence against individuals. In turn, reports of these atrocities led to a growing apprehension and self-awareness of the Serb minority in Bosnia-Herzegovina. The ascent of the Albanians in Kosovo led to the political awakening of the Albanian minorities in Macedonia (FYROM) to the point of destabilizing the country. This turmoil, in turn, created a political ripple effect among the “Turks” in Bulgaria. The socio-political awakening of the “Turks” of Bulgaria has clear political ramifications to the point of the “Turks” forming their own political party aimed at protecting and preserving “rights” which have never been threatened in post-communist Bulgaria.

Then, early 2010 saw the rebirth of the violent nationalistic and anti-Turkish Internal Macedonian Revolutionary Organization, the VMRO. Originally, VMRO was the Slavonic revolutionary national liberation movement during the Ottoman occupation of the Balkan Peninsula in the late 19th and early 20th centuries. Similar cyclical dynamics can be detected among the Crimean Tatars in Ukraine who have served as a catalyst for the counter-surge among the Russian minority in Crimea. These are but a few such eruptions brewing in the GBSB. The aggregate impact of all of this is that the popular de-legitimization of states and societies is further expanding and will be impossible to completely reverse.

Underneath these popular movements is a layer of growing *jihadist* terrorism that is potentially more dangerous than before. At the crux of the new threat are the new *jamaats* — *jihadist* societies — which got their boost in the aftermath of the Russian victory in Chechnya and the North Caucasus as a whole. The *jamaats* are comprised of very small cells — less than a dozen members each — who consider themselves to be the sole guardians of true Islamic

orthodoxy and thus practice the ultimate alienation from modern society and the state.

The unique characteristic of the *jamaat* is disengagement from society to the point of considering even the Muslim population hostile and untrustworthy. Hence, much like the “Foco” doctrine of Fidel Castro and Che Guevara, one of the objectives of the *jamaats* is to use indiscriminate terrorism in order to provoke the security forces to retaliate against the civilian population, thus instigating a cycle of violence which will fall on the fertile grounds of grassroots ethno-religious alienation and hostility. Ultimately, this cycle of violence will serve as the harbinger for a greater Islamic Revolution.

In practical terms, because the *jihadist jamaats* are no longer populist movements but rather very small isolated clandestine cells, it is far more difficult for intelligence and security services to discover and penetrate them. The Russian security services are discovering this in the North Caucasus. Throughout the GBSB, there are bubblings of clandestine *jihadist* cells in the form of *jamaats*. Most threatening are the new *jamaats* throughout the former Yugoslavia because of their close relations with *jihadist* movements and cells all over the world. For example, during the 2009-2010 Christmas-New Year holiday season, several West European intelligence services were alarmed by the flow of *jihadists* from both Western Europe and the Arab World to the village of Gornja Maoca in northern Bosnia. Hence, in early February 2010, the EU compelled Bosnian Police to raid the place. A few people, including the local neo-*salafi* cleric Nusret Imamovic, were arrested but released soon afterwards. Similar *jamaats* are springing out among the Crimean Tatars in Ukraine, and increasingly in all major GBSB cities where there are Muslim workers.

Meanwhile, Georgia was actively seeking to exploit the

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spread of *jamaats* in the North Caucasus in order to go after the Russian pipelines in hope of ensnaring the US into actively supporting a new confrontation with Russia. In early December 2009, Tbilisi organized a high-level meeting of *jihadist* groups from the Middle East and Western Europe in order “to coordinate activities on Russia’s southern flank”. The Georgian Embassy in Kuwait, for example, arranged for travel documents for *jihadists* from Jordan, Saudi Arabia and the Gulf States. (There is a large and very active Chechen/Circassian community in Jordan since the 19th Century which is heavily represented in the intelligence services and the military.) In Tbilisi, Deputy Minister of Internal Affairs Lordkipanadze was the host and coordinator. The meeting was attended by several Georgian senior officials who stressed that Saakashvili himself knew and approved of the undertaking. The meeting addressed the launch of both “military operations” in southern Russia, and ideological warfare. One of the first results of the meeting was the launch, soon afterwards, of the Russian-language TV station First Caucasian.

The *jihadists* of the North Caucasus — including the Arab commanders in their midst — came out of the early December 2009 meeting convinced that Tbilisi was most interested in the spread of terrorism. The meeting was attended by, among others, Mohmad Muhammad Shabaan, an Egyptian senior commander who was also known as Seif al-Islam and who had been involved in Caucasus affairs since 1992. He took copious notes. According to Shabaan’s notes, the Georgian Government wanted the *jihadists* to conduct “acts of sabotage to blow up railway tracks, electricity lines and energy pipelines” in southern Russia in order to divert construction back to Georgian territory.

Georgian intelligence promised to facilitate the arrival in the Caucasus of numerous senior *jihadists* by providing

Georgian passports, and to provide logistical support including the reopening of bases in northern Georgia. Russian intelligence was not oblivious of the meeting. Seif al-Islam and two senior aides were assassinated on February 4, 2010. The Russians retrieved a lot of documents in the process. Moscow signaled its displeasure shortly afterwards when the presidents of Russia and Abkhazia signed a 50-year agreement on a Russian military base in order to “protect Abkhazia’s sovereignty and security, including against international terrorist groups”.

A major issue still to be resolved was the extent of US culpability.

The US was the prime loser of the August 2008 war and the ensuing shift in the EU’s energy security policy. The US relied heavily on pipelines and railways across Georgia as an instrument for reducing Russian supplies to Europe. After the war, the EU’s willing dependence on Russia — rather than being beholden to Saakashvili’s antics — had, of course, grand strategic ramifications for the consolidation of a new “Eurasia Home” in which the US was an unwelcome guest or even intruder.

The undermining of Russia’s ability to be a reliable supplier — through the use of *jihadist* terrorism against energy and transportation targets — could possibly send the EU back to using the Georgian venue and thus recognize US influence. As discussed above, in the past, Washington entertained the use of *jihadist* terrorism in support of its pipeline policy. Hence, the major question was whether the US initiated this meeting or merely knew in advance and did not prevent it. There is no reason why Tbilisi would not initiate such a move in hope of ensnaring Washington into supporting Georgia. However, given the extent of the US presence in Georgia and close cooperation with Jordanian intelligence it is inconceivable that the US was taken by sur-

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prise. For sure, Washington did not condemn the meeting and did not warn Tbilisi not to implement its resolutions. As well, the warship USS *John Hall* was dispatched to conduct joint drills with the Georgian Navy and closely monitor the maneuvers of the Russian Black Sea Fleet in the area.

The hottest “frozen conflict” which could set the region aflame is the Nagorno-Karabakh Conflict. The lingering unresolved conflict is more than the prolonged human tragedy of the displaced Armenians and Azerbaijanis, as well as the economic suffering of the Armenian population of Nagorno-Karabakh. The economically and strategically most viable route for transporting the hydrocarbons of Azerbaijan and Central Asia to Turkey — both Mediterranean ports and onward to Europe — is via the southern route along the Arak River valley. But this means having Armenia withdraw from Azerbaijani territory and resolving the Nagorno-Karabakh Conflict. Both the EU and Russia have long concluded that the only viable solution to the Nagorno-Karabakh Conflict is by ensuring internationally guaranteed and monitored “wide autonomy” to the Armenians of the Nagorno-Karabakh enclave while preserving the territorial integrity of Azerbaijan. The presently used northern route via volatile Georgia was adopted solely because the southern route is blocked by the unresolved conflict.

However, the US — in its capacity as a co-chair of the OSCE Minsk Group — was preventing the reaching of a negotiated solution by insisting on the conduct of a referendum in which independence for the Armenian enclave was a viable option as a precondition for any agreement. And the Armenian leadership in Stepanakert had long been mobilizing the population to support only the independence option. The extent of the support of the Obama Administration was made clear with the nomination of the

key senior diplomats who facilitated Kosovo's unilateral declaration of independence to the key positions responsible for handling the Nagorno-Karabakh Conflict.

Little wonder that Baku — the would-be primary supplier for the pipelines via Turkey — has been most frustrated by the deadlock, and particularly the US intransigence. Hence, the spate of threats of war coming out of Baku amounted to warnings of a war which would spread all over the region to the detriment of Europe's energy supplies. Meanwhile, all key European capitals, and a reluctant Washington, accept that there can be no military resolution of a frozen conflict in the Caucasus without the consent and support of Moscow. Regarding Nagorno-Karabakh, the key question was no longer whether the Azerbaijani armed forces could liberate their land, but whether Moscow would support such a move.

Just how hypocritical and self-serving Washington's position has been can be best deduced from the US contradictory position in the former Yugoslavia. The only exception has been the insistence of the US and the EU on undermining and cancelling the independent existence of the Serbs' Republika Srpska in Bosnia-Herzegovina in the name of democracy, and accession to the EU, but in flagrant violation of the US-mediated and imposed Dayton Accords of 1995 which ended the Bosnian fratricidal civil wars. Banja-Luka remained adamant on the conduct, later in 2011, of a referendum on autonomy for Republika Srpska or integration into Bosnia-Herzegovina. Bosnian Serb leaders reiterated that secession and independence would not be put to vote in the referendum. And there should be no legal problem for the EU to handle the accession of a country with an autonomous zone, as aptly demonstrated in the EU's handling of the accession of Cyprus.

The real issue has been the US insistence on a unitary

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state comprised of cantons with latent ethno-national character. In early 2010, Obama's State Department identified the brewing crisis in Bosnia-Herzegovina as one of the four "major foreign affairs challenges in store for 2010" (along with Afghanistan, Iran, and Iraq, but neither the Middle East nor the Arab-Israeli conflict). The inclusion of Bosnia-Herzegovina in this list was because the formulation of its future will be a critical facet of US relations with the EU. The State Department has been convinced that the key issue between official Washington and the new post-Lisbon bureaucracy in Brussels would be establishing permanent political order in Bosnia-Herzegovina. That is, the future character of US-EU relations — and particularly the extent of US influence over the EU — would be determined via the handling of the forthcoming crises in Bosnia-Herzegovina. And the Obama Administration was committed to enshrining "the legacy of Dayton" as the unshakeable foundation of the joint US and EU policy.

Zagreb clearly got the drift coming from Washington. Starting late January 2010, then Croatian President Stjepan Mesić warned repeatedly that "the Croatian Army [would] invade Republika Srpska if secession from Bosnia occurs". In early February 2010, Mesić reiterated that the Croatian Army would "cut off the corridor connecting the Republic of Srpska [in Brecko] if it were to try and secede from Bosnia-Herzegovina".

Significantly, the US did not react when Mesić threatened a military invasion of a neighboring state.

In contrast, the Kremlin has been reluctant to break away from Moscow's long-held commitment to the territorial integrity of the post-Soviet states, as well as its adamant and principled opposition to unwarranted secessionism and the establishment of mini-states (including beyond the Commonwealth of Independent States [CIS] area). Ulti-

mately, the Kremlin has been first and foremost adamant on consolidating Russia's regional hegemony. Therefore, Moscow tolerated and embraced the break-up of Georgia by its protégés. In practical terms, Moscow wants stabilization and Finlandization — namely, a condominium of EU economic and social influence and Russian security dominance — for the former Soviet-states in the GBSB in order to ensure a GBSB conducive for energy transportation. Russia accepts the EU's Eastern Partnership as *à fait accompli* which will alleviate some of the economic burden off Russia's shoulders without really challenging Russia's strategic pre-eminence, if not hegemony.

Among the GBSB states themselves, Romania has the most responsible and clairvoyant policy. Bucharest's overall approach to "frozen conflicts" was articulated by President Traian Basescu in late-September 2009. "We want to reiterate that Romania's position remains unchanged. Romania considers that the "frozen conflicts" should be solved only peacefully, basing on the norms and principles of the international law, respect for the states' territorial integrity," he said.

Bucharest demonstrated leadership in addressing these challenges. In mid-October 2009, Romania, Spain, and Cyprus announced their participation in a UN Court case, arguing that Kosovo's 2008 unilateral declaration of independence was illegal. The three EU states joined Serbia and Russia in giving legal depositions at the International Court of Justice in The Hague. Romania had also been helping both Azerbaijan and Moldova in defusing and solving their respective secessionist "frozen conflicts". Meanwhile, Bucharest had been making great efforts to ensure that the drastic measures undertaken in view of the economic crisis and severe recession did not engender regionalization and increase internal strife. The expediency

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of these efforts was recognized by the IMF in mid-February 2010 with the approval of a \$3.32-billion emergency loan.

But all these measures do not address the crux of the overall problem: the fracturing and radicalization of societies in distress throughout the GBSB. The enduring unresolved “frozen conflicts” serve as a constant reminder and growing allure to other population groupings in distress. Indeed, the ethno-centric revivalism has begun to spread to countries considered stable and free of problems. Regional states are also driven to frustration and militancy, threatening to strike out against minorities and sub-state entities which they consider hostile and challenging.

Thus, the overall stability in the GBSB keeps deteriorating due to exacerbation of ethno-centric politics just as the GBSB’s significance for the economic well-being of the EU and the overall stability of Eurasia keeps growing. Simply put, the EU cannot afford to have its primary source of hydrocarbons held hostage to a myriad of irreconcilable ethno-centric disputes and brewing conflicts.

Hence, the GBSB must be quickly defused. At least the process must start before violence erupts and engulfs the entire region. While economic recovery cannot be accelerated, ethno-centric separatism and secessionism can be addressed. The key to the defusing of these very hot and volatile “frozen conflicts” lies in the formulation of new international laws and modalities for realizing minorities’ quest for self-determination in the context of wide autonomy and the preservation of the territorial integrity of viable states.

Moreover, a patchwork of instant gratification localized arrangements would no longer suffice. Given the gravity of these conflicts, there is an urgent imperative to address the issue of unwarranted secessionism and failed mini-states in its entirety. Presently, there is an ambiguity in both interna-

tional law and practice emanating from the inherent contradiction in the Helsinki Accords between the inviolability of state borders and minorities' quest for self-determination. Subsequent UN resolutions and on-the-ground precedents — Kosovo being one, and the most destructive — only confused matters further and complicated the guidelines for prudent conflict resolution. The restricted interpretation of the pertinent UN Resolutions exacerbated all other separatist and secessionist conflicts.

The UN Charter explicitly recognizes the right of peoples to self-determination. The General Assembly adopted, on December 14, 1960, Resolution 1514 relating to the granting of independence to colonial countries and peoples, which represented a major contribution to the promotion of this concept. Paragraph Two of Res. 1514 stipulates that all peoples have the right to “freely determine their political status and to freely pursue their economic, social and cultural development”. The Resolution delineates the scope of this principle within the well-defined framework of the national unity and territorial integrity of States as stated in Paragraph Six of the same Resolution.

Resolutions 1541 and 2625, dated December 15, 1960, and December 24, 1970, respectively, corroborate the gradual development and codification of this principle. Resolution 1541 states in its Principle VI that “a non-self-Governing territory can be said to have reached full a measure of self-government by emergence as sovereign independent State; free association with an independent State; or integration with an independent State”. Resolution 2625 further clarifies the meaning of the two previous resolutions, when it states that “the establishment of a sovereign and independent State, the free association or integration with an independent State or the emergence into any other political status freely determined by a people constitutes modes of

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implementing the right of self-determination by that people”. Hence, the drafters of these resolutions did not restrict the right to self-determination to the option of independence in order to take account of the complexities of cases that would emerge on the international scene, and ensured that an automatic implementation of this principle would not lead to absurd situations.

In facing these situations, the international community is reluctant to address each conflict separately because of the fear of losing faith or inciting frustrated minorities into radicalism, terrorism and criminality.

Future solutions and amended international legislation must ensure comprehensive individual and communal rights for discernable minorities and other groups with a legitimate quest for self-determination. At the same time, such solutions must be practical and therefore priority should be given to the organizational and economic viability of a would-be autonomous zone or mini-state, as well as its impact on the overall national and regional stability. Emerging socio-political trends must be taken into consideration; namely, the growing complexity and multi-faceted character of modern economies and governance in concurrence with the decentralization of communal life. All of which indicate that preference should be given to addressing the quest for self-determination within the context of a larger political framework; ie: a form of wide autonomy while securing the territorial integrity of the existing and recognized state. That means the reading of the existing UN legal material in conformity with the spirit of the founders of this international legislation and their aim to avoid non-sustainable nations and failed states.

The viable working solution should therefore be based on a comprehensive addressing of the entire phenomenon of unwarranted secessionism and failed mini-states, as well

as their global ramifications.

There is a need for formulating updated international laws, guidelines and criteria to define the concept of viable and sustainable states to balance the legitimate quest of small groups for self-determination with the legitimate and vital interests of states, regions and the entire world. It is therefore imperative to formulate a systemic legal approach to defining and defusing the lingering secessionist conflicts in pragmatic and practical manners. The viable solution should be based on internationally guaranteed and secured minority rights in the framework of extended autonomy because any further dismemberment of states will enshrine instability the world can ill afford. Subsequently, both governments and minorities will have to accept painful compromises in the name of revisited international standards.

Hence, the crux of the defusing of the GBSB in the immediate future lies in the formulation and implementation of autonomy-based conflict resolution.

The international community should make clear to all that states cannot be further broken down if only because of regional stability and global economic considerations. At the same time, lingering legitimate concerns of distinct population groupings and minorities can, and should, be addressed in the context of internationally regulated, guaranteed and secured autonomy.

Creating hope on the horizon that at least some of the problems will be solved and that the international community cares would help defuse the GBSB and thus expedite its stabilization and ensuing economic development. Presently, the EU and Russia are inclined to pursue this approach in principle.

The gravity of the situation in the GBSB, and the great stakes for the global economy and stability, make implementation an urgent imperative.

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V

Stepping Up the Eurasian Energy Integration

A floating alternative to the Nabucco pipeline helps European energy supplies, but limits Turkey's rôle

By Yossef Bodansky and Gregory R. Copley

The spread of infrastructural linkages from the Central Asian fossil fuel resources to the markets of Europe and the PRC began to show its shape by the end of 2010. However, the US-sponsored Nabucco pipeline project, which was to have given US investors a place in the network, avoiding to some degree Russia's strong hand in the system, was all but sidelined by events.

The "floating alternative to the US-sponsored Nabucco" pipeline network to bring Central Asian gas supplies to Europe and the Mediterranean began to materialize by late 2010, further transforming or limiting the prospects for the Nabucco project which was emerging as an expensive option led by the US strategy to bring Turkey into the Euro-

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pean mainstream.³⁹

The EU website *Euractive* reported on September 20, 2010: “Two EU members, Romania and Hungary, have joined forces with Azerbaijan and Georgia around a project to ship liquefied Azeri gas to their region. Supporters argue that the project could be implemented quickly, but critics point to high costs and vulnerability.”

The *Defense & Foreign Affairs* report of April 6, 2010, cited as Appendix i of this study, and entitled *A Floating Alternative to Nabucco Undercuts Potential Disruptions to EU Energy Supplies and Reduces Turkish Leverage Potential Against the EU*, noted: “In late February 2010, Romania, Azerbaijan, and Georgia finalized an agreement on the direct export of Azerbaijani natural gas to Romania. This has profound ramifications for halting Turkey’s ability to hold the EU hostage to energy supplies via Turkey, and offers far more rapid easing of European energy pressures.”

The September 20, 2010, report highlighted the fact that the new network had, indeed, been implemented rapidly. The state-owned energy companies from Azerbaijan, Georgia and Romania on September 14, 2010, signed a memorandum of understanding in Baku, Azerbaijan, to launch the Azerbaijan-Georgia-Romania Interconnector (AGRI) project, and a new company was created with the initial task of undertaking a feasibility study and raising funds. This was followed by what was called “the AGRI Summit” in which Azerbaijan Pres. Ilham Aliyev, Georgian Pres. Mikhail Saakashvili, Romanian Pres. Traian Basescu, and Hungarian Prime Minister Viktor Orbán participated.

On September 20, 2010, Hungary announced it could become a shareholder in AGRI, giving each country a 25 percent stake in the project. As the April 6, 2010, *Defense &*

39 See Appendix i: *Defense & Foreign Affairs Special Analysis* report of April 6, 2010: “A Floating Alternative to Nabucco Undercuts Potential Disruptions to EU Energy Supplies and Reduces Turkish Leverage Potential Against the EU”.

Foreign Affairs report noted, AGRI was designed to transport Azerbaijani gas by pipeline to the SOCAR-owned Kulevi terminal on the Georgian coast of the Black Sea, where a liquefaction plant was to be built. From there, liquefied gas would be shipped across the Black Sea by tankers to new terminals in the Romanian port of Constanta. From Constanta, the gas would be distributed through the Romanian pipeline system. From there, the gas would be pumped to Hungary and the rest of the European market.

The new system maximizes, insofar as possible, the independence of Azerbaijan and Georgia from both Russian and Turkish (and also US) pressures, giving both states a modicum of recovery from the position they faced in August 2008. The US-backed Georgian bid to militarily seize control of the enclaves of Abkhazia and South Ossetia failed, and, with that, the US ability to support and influence the region — particularly Turkey, Azerbaijan, Georgia, and Ukraine — essentially disappeared.⁴⁰

The AGRI option would also allow Azerbaijan, a Turkic state, to build a measure of independence from its historically key regional partner, Turkey, given that the Islamist leadership of Turkey had now opened a significant — albeit sometimes rocky — dialog, at Russia's insistence, with Iran, which, working with Armenia, was Azerbaijan's major potential security threat. Moreover, although Azerbaijan and Georgia needed to have options for the transportation and sale of gas (in particular) not directly controlled by Moscow, both states had begun developing a more stable *modus vivendi* directly with Russia. The EU, too, would gain from having a new delivery route for Central Asian energy.

The only losers would be Turkey, and the last remnants of US influence in the region.

⁴⁰ See *Defense & Foreign Affairs Special Analysis*, September 23, 2008: "A New Strategic Framework Emerges Gradually, Post-Georgia, in European, Russian, and Central Asian Energy, Marginalizing the US".

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Significantly, quite apart from the Nabucco network through Turkey (which, as yet, had no firm commitments of product to deliver through its pipeline), Turkey was now also not expanding the oil and gas transit business it had hoped for from Baku. The AGRI development signified that Azerbaijan had options other than through the 1,768 kilometer (1,099 mile) Baku-Tbilisi-Ceyhan (BTC) pipeline, which delivers oil from the Azeri-Chirag-Guneshli oil field in the Caspian Sea shores through to the Turkish Mediterranean port of Ceyhan. Oil from the 1,070mm/42-inch BTC pipeline was also to have been transported to eastern Asia — particularly India and the People's Republic of China (PRC) — via the Israeli oil terminals at Ashkelon (Mediterranean) and Eilat (Red Sea), the overland trans-Israel sector being bridged by the Eilat-Ashkelon Pipeline owned by the Eilat Ashkelon Pipeline Company (EAPC).

The breakdown in Turkish-Israeli relations jeopardized that trade.

On September 23, 2010, the Azerbaijan Government indicated that Azerbaijan had, to September 20, 2010, transported 133.4-million tons of oil via the BTC pipeline, and 15.4-billion cubic meters (bcm) of gas via the Baku-Tbilisi-Erzurum pipeline. The BTC began operations in 2006, with an annual capacity of 50-million tons a year. The Baku-Tbilisi-Erzurum gas pipeline has been in operation since 2007, with an annual capacity of 20-bcm. Turkey, then, has seen the promise of the BTC being fulfilled, but the gas pipeline had — by 2011 — yet to live up to capacity. The great hope for growth in this field had not, then, been fulfilled, by 2011 undermining the viability of the Nabucco option, championed by the US.

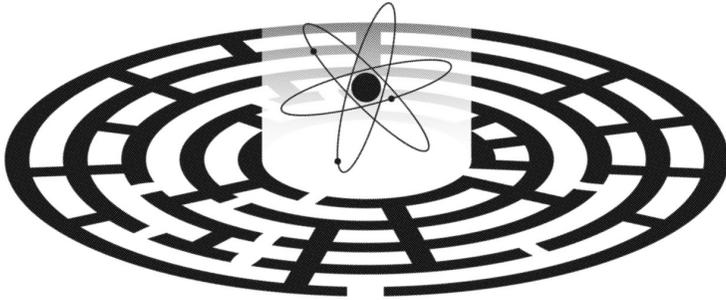
Azerbaijan, then, had not, by early 2011, been neglecting Turkey — or even, for that matter, sales to Iran — but it hedged its bets, with AGRI. This indicated, as much as any-

thing, that the post-US era of control of energy flow in and through the Caucasus had settled down, largely in favor of Moscow, but certainly continuing to edge away from Washington.

US Pres. Barack Obama had clearly been briefed on the strategic importance of Azerbaijan to the US, particularly with regard to US support for its ongoing engagement in Afghanistan, quite separately from the fact that Baku was the entry point for any real US diplomacy into Central Asia. Pres. Obama and Pres. Aliyev met in New York during the United Nations General Assembly session on September 24, 2010, and it was clear that Pres. Obama was keen to repair the bilateral relationship. Some 25 percent of the non-lethal logistical support for the US-led Coalition in Afghanistan, including fuel and food, was still — as at early 2011 — being transported via Azerbaijan. Moreover, the US had been less than helpful to Azerbaijan in the dispute with Armenia over the fate of the ethnically-Armenian enclave of Nagorno-Karabakh, in Azerbaijan. The US has had — since the end of the Cold War — a lot at stake in Azerbaijan, and Azerbaijan has some strong bargaining chips to win a change in Washington's approach to Nagorno-Karabakh.

Even so, while Pres. Obama was wooing Pres. Aliyev in New York, the US Government-controlled broadcaster, Radio Free Europe/Radio Liberty, was still pushing an anti-Aliyev line.

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VI

The Path to Energy Security

A Case Study of Australia

“One day we will run out of oil; it is not today or tomorrow, but one day we will run out of oil and we have to leave oil before oil leaves us, and we have to prepare ourselves for that day.”

— *Fatih Birol, Chief Economist of the International Energy Agency*

By David Archibald

Tin a long-term context, global oil production entered a period of inherent over-supply following the discovery of the East Texas field in 1931. To support prices, the Texas Railroad Commission was given the rôle of controlling individual field output.

Then, following the peak of US oil production in 1973, the rôle of controlling production to support prices was assumed by OPEC. The period of inherent over-supply ended in 2005 as import demand from the People’s Republic of China (PRC) began to accelerate, and non-OPEC oil production peaked. By the beginning of 2011, projections

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were that non-OPEC production would begin a steep decline from 2013, after which OPEC production would also enter into decline, although this may be ameliorated by rising Iraqi production.

With static non-OPEC supply and increasing world GDP, the oil price rise following the end of inherent over-supply has been at the rate of about US\$10/bbl a year, while being very volatile around that trend. The rate of price increase will accelerate once non-OPEC production goes into decline. Non-OPEC oil production was expected to halve by the end of the 2010 decade, falling from close to 40-million barrels a day to 20-million barrels a day. The methodology used to derive that prediction is the same as that used by a Shell geologist, King Hubbert, who, in 1956, predicted that US production would peak in the early 1970s.

Economies can stand very high oil prices, as shown by the effective retail price of liquid fuels, due to taxes, in Germany of US\$290/bbl and in the UK of US\$260/bbl. By comparison, Australians are effectively paying US\$160/bbl at the retail level. That being said, there will be three effects of higher oil prices: changes in consumer behavior; inter-fuel substitution; and recession. An example of the former effect is the much higher fuel efficiency of German vehicles, on average, relative to US vehicles.

The liquid fuel market and the power station fuel market have operated separately until this point (the end of the first decade of the 21st Century). However, the rising oil price will result in substitution of power station fuels (coal and natural gas) into the liquid fuel market, and substitution of nuclear for coal in the power market. When prices hit US\$120 per barrel, it becomes worthwhile to build nuclear power plants in order to be able to close existing coal-fired power plants so that the coal they burn can be freed for use in coal-to-liquids plants.

The significant oil price rise in the second half of the 2010s can be expected to be very disruptive to those countries and economic entities that have not prepared to adapt to high liquid fuel prices and their flow-on effects.

Australian Oil Supply

Until the development of the Bass Strait oilfields in the late 1960s, Australia imported almost all of its oil requirements from the Middle East. The country, polity and public, was well aware of how vulnerable it was to potential oil supply disruptions, manifesting in a Federal Government subsidy for oil exploration to encourage indigenous production. The prices of imported Middle Eastern crude were in fact so low at the time, that the initial development of the Bass Strait fields was uneconomic and was subsidized by a tax on petrol.

For the 40 years until 2011, Australia was largely self-sufficient in oil which has protected the country from supply shocks. However, self-sufficiency was, by the end of 2010, dropping rapidly and was expected to be down to 30 percent by 2015. In terms of supply logistics, the situation was becoming more critical; following the closure of the Adelaide refinery in 2001 and subsequent market growth, 24 percent of liquid fuel consumption was being imported as refined product, two-thirds of it coming from Singapore.

This has significant implications for future supply security as, even if crude stocks were available locally, Australia would suffer a reduction in supply of at least 25 percent in the event of an international supply disruption. This could be exacerbated considering that the import share of refined product demand is expected to rise to 31 percent by 2020. A supply disruption would also be felt very rapidly because there are only about two weeks of stocks in the Australian supply chain, as commercial operators keep the amount of capital they have tied up in the supply chain to the mini-

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imum for effective operation. The US Strategic Petroleum Reserve currently holds 726-million barrels, the Japanese strategic stock position is 583-million barrels, and the People's Republic of China (PRC) currently has 272-million barrels of strategic stocks, with a plan to take that to 685-million barrels by 2020. In comparison, Australia's strategic stock position lags behind at nine-million barrels which, relative to the US stock position, should be at least 45-million barrels.

Oil refining capabilities also influence countries' capacity for providing constant supply. A high proportion of the oil produced in Australia is heavy crude which would have low yields through Australia's refineries, as Australian refineries, most of which date from the 1950s and 1960s, were designed to process lighter crude blends. However, given the short production lives of these heavy crude fields, it is not worthwhile to reconfigure Australian refineries to handle this type of oil. Similarly, Australian condensate production is expected to rise over the decade as a byproduct of higher LNG production. Australian refineries could process a portion of this LNG-related production, but with a yield loss of 30 to 40 percent.

Each of the seven operating Australian refineries is different and has its own design characteristics and bottlenecks. The overall problem with processing more condensate would be constraints on cooling the overhead vapors from the crude distillation towers. In order to add cooling capacity to all Australian refineries to accommodate some additional condensate, approximately \$600- to \$800-million would be required, yet it still may not be physically possible because of a lack of space and ageing equipment. In addition to other potential operating constraints, that would make such a de-bottlenecking completely unrealistic. It would be possible to oligomerize condensate to pro-

duce diesel, but this is also unlikely to be economic given that the alternative is to export the condensate at a slight discount to the oil price.

The Federal Government is well aware of the problem of Australia's declining oil self-sufficiency. Awareness of the problem possibly peaked in 2005, as evidenced by the speech given by the then leader of the Australian Labor Party, Kim Beazley (now Australian Ambassador to the United States) to the Australian Institute of Company Directors on October 19, 2005:

“As Australians queue for petrol at around \$4, \$5, potentially up to \$10 a liter even further down the track, the questions will be: ... how had our Governments not seen the writing on the wall? ... didn't our leaders foresee the soaring demand? ... didn't our leaders do their sums and realize demand would outstrip supply? ... couldn't they foresee the threats to supply? why didn't they put the national interest first? ... and why was Australia so unprepared?”

The first four of Mr Beazley's questions effectively ask the same thing. Statements made by Martin Ferguson, Australian Minister for Resources (as at publication date, January 2011), indicated that he was also aware of the problem of the economic and security consequences of Australia's declining oil self-sufficiency. However, while the Federal Government was aware of the problem, it appeared to be doing nothing. The Federal Government delayed release of its *Energy White Paper* (16 months overdue as of January 2011), in accordance with the political need to support the theory of anthropogenic global warming. This theory is the antithesis of preparing for the consequences of declining Australian oil self-sufficiency, which is a worldview of imminent turmoil and economic disruption.

The conflict between global warming policy and Australia's energy security is quite evident in the structure of Aus-

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tralia's power supply. The power industry is not investing in coal-fired power stations, which would provide the cheapest power of any near term source, while there is potential for a carbon tax. This is causing higher costs and potential system failure. One of the last actions of the Liberal-National Coalition Government of Prime Minister John Howard (1996-2007) was the passage of the National Greenhouse and Energy Reporting Act in October 2007. This is the auditing basis of any carbon tax which might eventuate, and requires entities emitting more than 25,000 tonnes a year of carbon dioxide to file an annual return. Repealing this act would be the signal to the animal spirits of the economy that Australian energy policy might return to being based on science and rationality. Similarly, the current Australian Labor Party Government of Prime Minister Julia Gillard (2010-) should not proceed with the Mineral Resource Rent Tax as it would suppress the build rate of the Australian coal-to-liquids industry, putting Australia's security and economy at risk.

The Solutions for Transport Fuels

While liquid fuels derived from oil were cheap, they were also the most convenient fuels to use due to their energy density. As liquid fuel prices rise, consumers will accept a trade off between capital cost, convenience, and price, with consequent market fragmentation. For example, in remote areas it will be very difficult to replace diesel as the fuel of choice, while in the cities, consumers making short journeys will happily switch to electric or compressed natural gas (CNG)-powered vehicles, as far more frequent re-fueling won't be such a significant inconvenience.

In order to facilitate a mass transition from oil-derived liquid transport fuels, consideration needs to be given to the three main solutions for transport fuels: coal-to-liquids (CTL), CNG, and electric vehicles. All these solutions have

a similar capital cost per vehicle of about \$5,000, representing about 25 percent of the capital cost of a new vehicle, which is not a significant barrier to adoption. Of these options, CTL emerges as the most promising because of the market segments it can serve. It would be very difficult, and thus expensive, to run Australia's agricultural industry on anything other than diesel. The same is true for the mining industry, fishing, defense and most long-haul transport requirements.

Australian oil consumption is currently 950,000 barrels per day. A commonly used figure for the capital cost of CTL plants is \$100,000 per barrel of daily production which is \$274 per annual barrel. The capital cost of supplying all of Australia's liquid fuel requirements from CTL plants would be \$95-billion, equating to \$4,500 *per capita*. This is not a daunting requirement for the country. By comparison, three recent Federal Government schemes — the Building the Education Revolution, the home insulation scheme and the National Broadband Network — totaled \$60-billion. None of these other initiatives provides an economic return or lowers business costs, whereas in comparison, CTL production at that level of production and a price of US\$200 a barrel, would result in company tax of \$17-billion a year being paid, as well as a lot of other taxes.

Product yield from coal varies with energy content, from 2.2 barrels per tonne of high grade coal down to 0.6 barrels per tonne of lignite. At two barrels per tonne, producing all of Australia's liquid fuel requirements would use 174-million tonnes a year. To put that figure into context, Australia mines about 400-million tonnes a year of coal and burns about 100-million tonnes a year to generate electricity, with the balance of 300-million tonnes a year being exported. Diverting some of that coal production to make the country's liquid fuel requirement would take over half the

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current level of exports.

As CTL plant economics are sensitive to coal input cost, what is more likely to happen is that CTL plants will be based on coal deposits that are stranded from the export market due to quality, either from too high an ash content or too high moisture content. Australia has substantial low grade coal deposits which could be applied to CTL projects, such as the Gippsland Valley in Victoria, which has an estimated 172-billion tonnes of mineable lignite. This could make 102-billion barrels of liquid fuel: equivalent to about 300 years of Australia's current consumption rate. There are also other lignite resources along Australia's southern coastline, as far as Esperance in Western Australia, which could be utilized for CTL production.

CTL projects would also have an enormous national security benefit in diversifying sources of supply. A high proportion of their product would be at or near final fuel specification, thus reducing reliance on refineries. There would be a significant economic benefit in that consumer spending on fuel would stay within the country, as well as the large amount of tax these projects would pay at high oil prices.

Supporting the production of CTL would also require strategic planning to augment its cost effectiveness and longevity. For high grade coal and an assumed 20 year project life, the capital cost per tonne of coal reserves for a CTL project is about \$23. The Net Present Value, per tonne, of coal at \$200 a barrel, would be \$66. At the January 2011 oil price of around US\$85 a barrel, it would be prudent to use nuclear power for the expansion of power generation capacity rather than build new coal or gas-fired capacity, as these latter two fuels will have a higher value use as transport fuels or feed-stocks. At US\$120/bbl, it becomes economic to close existing coal-fired power generation capac-

ity and replace that capacity with nuclear generation in order to free coal for use in CTL plants.

Just as the oil and natural gas prices have converged through the mechanism of the Liquefied Natural Gas market, as the oil price has risen, the coal price will too converge with the oil price (less a discount for the capital and operating costs of conversion through a Fischer-Tropsch plant).⁴¹ Many coal companies in Australia have potential long term liquids production that dwarfs that of most oil companies; coal can be considered to be diesel that has yet to go through a Fischer-Tropsch plant.

Half of the current retail price for petrol and diesel in Australia is fuel taxes which gives the Federal Government the opportunity to provide price support to Australian CTL projects without burdening the Australian taxpayer. Providing price support through the excise tax regime reduces a project's financing risk and thus lowers the cost of capital. To that end, the Federal Government could reduce the excise on fuels made in CTL plants at the rate of one cent per liter for every dollar that the oil price falls below US\$80 per barrel.

Technological advancements and market expansion in liquid fuel delivery are affecting supply changes in Australia's immediate region and beyond. Australia's near neighbor to its north, Indonesia, also consumes about one million barrels per day of liquid transport fuels. Once a member of OPEC, Indonesia is now a net oil importer with its own production projected to decline from 750,000 barrels a day by the end of 2010, to 250,000 barrels a day by 2020. To offset this decline in supply, the South African synthetic

41 "Fischer-Tropsch refers to a process which uses carbon monoxide and hydrogen to convert coal or gas to different liquid fuels. While originally developed in Germany in the 1920s to generate liquid fuel from coal-rich nations, the process has since been gaining momentum worldwide." Source: Bowen, Brian H., Irwin, Marty W., and Canchi, Devendra, 2007, "Coal-To-Liquids (CTL) and Fischer-Tropsch Processing (FT)". Indiana Center for Coal Technology Research.

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fuels company, Sasol, announced an intention to build an 80,000 barrel a day plant fueled by lignite, and ultimately will expand capacity to one-million barrels a day. At that rate, Indonesia would be producing twenty times as much carbon dioxide as the current Latrobe Valley [lignite-fired] power stations in Australia.⁴²

Also instructive is the PRC's approach to energy security. Based on its 2010 domestic supply and demand trajectories, the PRC would be importing, or otherwise substituting, 10-million barrels a day by the end of the decade, which is not that much less than the 2010 US import rate of 14-million barrels per day. The PRC has begun a CTL plant build in response, with three Fischer-Tropsch plants and one liquefaction plant commissioned and three Fischer-Tropsch plants under construction, for total planned production in excess of 600,000 barrels a day, signifying an increasing incorporation of CTL into its supply strategy.

In countries where there is a large natural gas reticulation system already established, compressed natural gas (CNG) has a great advantage as a transport fuel. CNG, at 3,600 psi, has 26 percent of the energy density of liquefied petroleum gas (LPG) and 17 percent of the energy density of diesel. The cost of an installed home compression system for natural gas is of the order of \$4,000. As the price of natural gas on the LNG market rises to the oil price, in energy equivalent terms, CNG is not likely to be much cheaper than petrol or diesel (excluding the effect of taxes), but it is, however, likely to be readily available for decades to come. Unlike LPG, there is effectively an unlimited supply of CNG for the transport market which thus means that CNG, as a transport fuel and within certain infrastructure param-

42 The former Victorian Government had proposed closing one quarter of the Hazelwood Power Station in the Latrobe Valley in order to reduce that State's carbon dioxide output of 122-million tonnes per year. That proposal would have replaced lignite-sourced power with natural gas in gas turbines.

ters, can offer a high level of supply security.

For short distances, natural gas is a reasonable substitute for liquid transport fuels. In the five years to the end of 2010, LNG contract pricing rose to near parity with the oil price. In Australia, some gas supply contracts in Western Australia, such as the contract for the Cape Preston iron ore project, have had their gas price going to parity with the oil price from mid-2010s, whatever that might be at the time. Effectively therefore, in economic terms, burning natural gas to generate power is equivalent to burning oil to generate power.

Australia also has 700,000 vehicles fueled by LPG, consuming a significant 60 percent portion of the 3.3-million tonnes a year produced in Australia. Around 20 percent of that production is from oil refineries, with the balance from gas fields. The east coast of Australia is a net importer of LPG while the west coast is a large net exporter. LPG has 65 percent of the energy density per liter of diesel. Australian LPG production is projected to rise to five mtpa [million tons *per annum*] by 2020, with most of this as a by-product of LNG projects in Western Australia. With an average annual consumption of 1.8 tonnes a year of LPG, at that rate the increase in Australian LPG production could fuel a further 1.7-million vehicles. It is likely to be worthwhile to build a dedicated pipeline for LPG from the LNG facilities north and south of Karratha to Perth. Significant market penetration of LPG in the southwest of Western Australia would impact on refinery runs at the Kwinana refinery south of Perth, but security of supply would only be dependent on continued operation of the exporting LNG projects.

It is likely to be very beneficial for Australia's energy security to extend the supply of natural gas in regional areas to meet the future needs of the transport sector, for example

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Albany on the south coast of Western Australia. Most CNG vehicles are dual fuel, in that is they have a backup tank of petrol or diesel, which means that they can be used for long distance travel and are unconstrained by the natural gas pipeline network. Extension of the natural gas pipeline network would also aid the development of LNG as a fuel for long distance trucking and heavy equipment.

Where there is a significant component of electricity generation using natural gas, natural gas vehicles have much higher energy efficiency than electric vehicles, due to system losses in power transmission and battery charging and discharging losses. Therefore, CNG-powered vehicles are far more efficient users of natural gas than electric vehicles. Price substitution effects suggest that nuclear power is the optimum source of power for electric vehicles. One exception would be remote areas where photovoltaic power for electric vehicles would be cheaper than diesel, including charging losses, at a diesel price of more than \$1.50 per liter.

Electricity Market

In the absence of a significant, elaborately transformed manufacturing component in Australian industry, a large proportion of Australia's competitive advantage has come from Australia's low electricity costs. This, in turn, is due to a wide distribution of cheaply mineable coal: black coal in Queensland and New South Wales, and lignite in Victoria. In Western Australia, the state has benefitted from cheap natural gas since the mid-1980s, with 65 percent of its power generated from natural gas and the balance largely from coal. This reliance on gas in Western Australia has now become a major negative in that the domestic gas price will follow the oil price through the alternative use in the LNG market. Western Australia, despite an abundance of other energy sources, will become one of the highest-priced electricity markets on the planet. The other states all have a

component of natural gas in their power supply, but none to the debilitating extent of Western Australia.

As is the fashion in a number of other countries, there is now a federally-mandated scheme to saddle Australian electricity generation with high cost supply from renewable sources. In Australia, this is called the Renewable Energy Target (RET) Scheme, which requires 20 percent of electric power to be supplied from renewable generation by 2020 or a penalty of \$0.065 per kWh will apply. This has resulted in a large build of wind power systems, possibly to the extent that the generating system can take this erratic and intermittent energy source. As all the wind component of the power supply needs to be backed up by a spinning reserve of open cycle gas turbines fueled with natural gas, this means that the gas turbines operate very inefficiently.

Further implementation of the RET Scheme is likely to require the use of solar thermal power stations with molten salt or thermal oil heat storage. At best, the price of power from this source will be at least \$0.20 per kWh, five times the cost of power from coal or nuclear power stations. Accordingly, the RET Scheme is expected to at least double the price of wholesale power in Australia. California adopted a similar scheme which required (and achieved) a 20 percent renewable component by 2011 and, as a consequence, was hosting a rapid build of a number of differing solar power technologies (as well as hydro, geothermal, and biomass schemes). It would have been prudent for Australia to have waited until the result of the vast Californian experiment with solar energy was known before committing the country to a similar scheme.

A number of Australian states also require significant expenditure on their power transmission and distribution systems, after over a decade of under-spending. The transmission and distribution cost is about half the cost of deliv-

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ered electricity. The price increases to pay for this capital expenditure will come at the same time as the RET Scheme-mandated price increases, with the total result being that power prices in Australia will double to triple over the next five years. Western Australia will have the worst result, with an extra component of oil price-related rise through the gas price.

On top of the price increases due to the enormous misallocation of resources through the RET Scheme, generators around Australia have not committed to the building of new coal-fired power stations due to the potential for a tax on carbon dioxide emissions. Growth in demand will mean that the east coast system will soon be short of sufficient reserve capacity to cope with peak summer demand. Thus, on top of the ideologically driven price increases from the RET Scheme, Australian power consumers could be suffering Third World-type power brownouts. The shortfall on the east coast power system will be 6,000 MW by 2018, about 12 percent of the capacity required for system reliability

The moral basis of the RET Scheme and restrictions on carbon emissions is a belief in catastrophic anthropogenic global warming. However, this belief is baseless as the warming effect from anthropogenic carbon dioxide is minuscule and the Earth has entered a sharp cooling trend due to weaker solar activity. The sacrifices that the Australian people will make to fund the RET Scheme will be in vain, and that Scheme will ultimately be seen to be a system of wealth transfer from Australian taxpayers to makers and operators of wind farms and solar paraphernalia.

Nuclear Power

The central thesis of this paper is that the rising oil price will drive inter-fuel substitution to the highest value markets, which are those transport applications which require a

high-density liquid fuel with good storage characteristics: essentially diesel and jet fuel. The contraction in global oil supply relative to established demand patterns will be relatively rapid, to the order of two-million barrels a day a year, and this contraction will go on for decades. To put that substitution requirement into context, if that two-million barrels per day were to be generated from coal going through Fischer-Tropsch plants, that would require the mining of an extra 365-million tonnes of coal a year. Over 10 years, that would mean mining an extra 3,650-million tonnes of coal a year, which is more than half of the current world production.

In the context of the LNG market, the two million barrels per day a year decline equates to increasing LNG production by 81-million tonnes per year. The world LNG market was 165-million tonnes in 2009, illustrating the magnitude of the task.

Rather than mining that extra coal or shipping LNG, it would be easier and more economical to replace existing coal-fired power generating capacity with nuclear power. A review of nuclear technology though suggests that the currently most widely used technology, which is U235 being burnt in Light Water Reactors (LWR), is not the optimum solution for Australia's power generation needs.

There are three nuclear fuels available from Nature: U235, U238 and Thorium. Only U235 is fissile in its native state and it must be used to start the nuclear process. There are vast differences in the relative abundance of the three fuels. Only 0.7 percent of naturally occurring uranium is U235. Existing nuclear practice is to burn only half of the U235 before the fuel is discarded and by that time, an equivalent amount of plutonium (itself a fuel) has been generated within the fuel rod. Current common practice is to store the spent fuel rods rather than reprocess them to re-

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cover the plutonium so that it could be used as a fuel (plutonium generated from long irradiation in a commercial reactor is unsuitable for weapons). Reprocessing to recover plutonium won't be commercially competitive with virgin U235 until the price of yellowcake rises to over US\$200/lb. The consequence of existing nuclear practice is to generate long-life, high-level waste which will take about 1.3-million years to decay back to the radiation level of the original uranium ore. Also, only about 0.5 percent of the energy inherent in the uranium ore is utilized.

Utilizing the rest of the energy in the uranium ore requires using a fast breeder reactor to convert U238 to plutonium. For this process to work with the requisite neutron economy, it has to be in the fast neutron spectrum. In turn, that requires the use of liquid sodium as the coolant. That in turn requires a relatively large reactor vessel due to the low thermal capacity of sodium. There is at least one reactor of this type that has been operating for decades: the BN 600 reactor at the Beloyarsk Nuclear Power Station, in Zarechny, Sverdlovsk *Oblast*, Russia. Attempts at building sodium-cooled fast breeder reactors in the US, Japan and France have been less successful. Plutonium-burning, fast breeder reactors also generate some transuranics — Americium, Curium, and Neptunium — which would have to be disposed of thoughtfully. The best way to dispose of these transuranics would be to use them as fuel in molten salt reactors.

That leads to thorium, which is the most promising route to nuclear power at this point in human history. Thorium is four times as abundant as uranium and has no existing commercial use. Thorium will breed to U233 in the thermal neutron spectrum, and the best way of achieving that is in a two fluid, molten salt reactor using a salt of lithium-beryllium fluoride. The technical aspects of this technology

were determined in a program at Oak Ridge National Laboratory, with a molten salt reactor running from 1965 to 1968. There is nothing in this type of reactor to burn or blow up, and the production of transuranic elements is at one ten-thousandth of the rate of the plutonium fast breeder route or LWR route.

Thorium reactors from 250 MW in size will be small enough to be built complete in a factory and shipped out to be married up to a steam turbine. By comparison, LWR technology requires a massive steel and concrete containment vessel in case of a steam explosion in the reactor. The cost of electricity from burning thorium is likely to be in the range of two to three cents per kWh. The most common thorium-containing mineral is monazite, which in Australia has been discarded as an unwanted by-product of mineral sands mining, however, the cost of commercializing thorium molten salt technology would be less than the cost of the Federal Government's fiscal stimulus program of subsidizing home insulation.

Agriculture

Fuel, fertilizer, and chemical input costs for Australian farms total about 22 percent of average cash costs. Almost all of these inputs are currently derived from oil and natural gas feedstocks. The rising oil price will result in these input costs at least tripling by the end of the 2010s, increasing total costs by the order of 50 percent. Growing crops to produce biodiesel to supply farm consumption of diesel alone would take about 20 percent of Australia's current crop area, with a corresponding 20 percent reduction in grain production.

Australia imports around one million tonnes a year each of phosphate fertilizer and urea. The rising international gas price is driving substitution by coal as a feedstock for urea production. An example of this is the Perdaman urea

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plant being built at Collie, Western Australia at a capital cost of \$3.5-billion. It will consume 2.6 mtpa of coal to produce two mtpa of urea. The high price of natural gas will result in an ongoing switch worldwide to coal for chemical feedstock production.

Summary

Australia, along with much of the rest of the world, is sleepwalking towards a major economic dislocation due to the rapidly tightening world oil supply. The sooner the country optimizes its resource allocation to meet that challenge, the less painful the experience will be.

This paper has outlined what that optimum resource allocation will look like. Imported oil should be displaced, primarily, by liquid fuels generated from low grade coal, and supplemented by vehicles using natural gas, LPG and batteries.

In turn, coal in power generation should be displaced by molten salt breeder reactors burning thorium. This would provide Australia with hundreds of years of abundant energy and a high standard of living.

To depart from this optimum resource allocation, or delay its implementation, would have the result of degrading Australia's standard of living and would put national security at risk.



VII

Energy: the Driver of the Grand Strategy of the PRC

By Yossef Bodansky

The power of the People's Republic of China (PRC) is clearly the key dynamic of Indo-Pacific and Eurasian geopolitics for the coming decade, and the PRC's focus on fossil fuels as an integral component and priority of this grand strategy will drive both energy markets and security issues for much of the world in the coming decade and more.

In 2009-10, the PRC was at a crucial junction in its historic ascent as a global strategic power, an ascent which be-

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gan meaningfully in the aftermath of the collapse of the Soviet Union some two decades earlier.

There were two major milestones in the evolution of the PRC's post-Cold War grand strategy.

The first phase ensued from the analysis by the PRC's People's Liberation Army (PLA) of the collapse of the Soviet Union, the then-nascent US-led globalization, the shape of hi-tech wars as demonstrated in the US-led Operation *Desert Storm* against Iraq (1990-91), and the trauma of the PRC's own Tiananmen Square confrontation (1989). These issues were studied in the context of Beijing's resolve to surge as a global hegemon (an historic term of the early Imperial era revived by the contemporary Chinese Communist Party) and fill the global vacuum created by the end of the Cold War.

Starting in the early-1990s, the PRC's High Command carefully studied the military aspects of the implementation of the forthcoming strategic surge. The conclusions were presented in a June 1993 textbook of the PLA High Command called *Can the Chinese Army Win the Next War?* in which the PLA defines the US as the PRC's principal strategic adversary and argues for regional wars by proxy. Beijing concluded that "the conflict of strategic interests between China and the United States ... is now surfacing steadily" to the point that Washington "absolutely cannot tolerate the rise of a powerful adversary in East Asia".

With the PRC determined to become the region's leading power, "the military antagonism between China and the United States" could reach the point of armed confrontation. The textbook examined numerous scenarios of regional and global wars. The book reached the conclusion that conventional hi-tech armed forces of the type the PLA was becoming were insufficient and ill-suited for the type of confrontations and challenges awaiting the PRC.

Shortly afterwards, in mid-1993, PRC leader Jiang Zemin and the Central Military Commission issued new military strategic guidelines which instructed the PLA to prepare for fighting and “winning local wars under modern especially high-technology conditions”. There followed a series of military and regional studies about modalities for implementation, particularly in and around Asia. One of the first key themes was the centrality of the Trans-Asian Axis, a term loosely used by the PLA to describe the system of military and security alliances involving the PRC, the DPRK, Pakistan, and Iran in order to better control and/or influence Central Asia and the Greater Middle East. The near-war with the US over the Taiwan Straits in the mid-1990s awakened the PLA General Staff to the complexities of sophisticated warfare and just how ill-prepared the PLA still was. This sentiment was later reinforced by the PLA’s intense lessons learned from the US bombing of Serbia during the Kosovo crisis of 1999. The various solutions conceptualized by the PLA General Staff were tested in a series of major military exercises throughout the 1990s.

The most important conclusion of this era of strategic-military transformation was the PRC commitment to vastly expand the scope of state-run asymmetric warfare to include criminality, terrorism, subversion, and cyberwarfare in order to compensate for the concurrent PRC weakness in conventional hi-tech warfare as well as to buy the PRC the necessary time to catch-up and even surpass the US-led West.

This led to the second, and current, phase in Chinese strategic thought.

Starting in the late 1990s, there began a growing emphasis on “irregular warfare” against the United States in PRC strategic thinking. Such a strategy was elucidated in the book, *Unrestricted War*, by Qiao Liang and Wang Xiangsui,

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published in Beijing in February 1999. Both authors were PLA active-service colonels and their writing represented the new strategic thinking among the PLA's senior officers. "We realized that if China's military was to face off against the United States, we would not be sufficient," Wang explained. "So we realized that China needs a new strategy to right the balance of power." Indeed, *Unrestricted War* became one of the hottest military books in the Summer of 1999. In their book, colonels Qiao and Wang presented a flow chart of 24 different types of war applicable for confrontation with the US including international terrorism, drug trafficking, environmental degradation, and computer virus propagation. They argued that the more complicated the combination of forms of warfare — for example, terrorism plus a media war plus a financial war — the better the results. "Unrestricted War is a war that surpasses all boundaries and restrictions," colonels Qiao and Wang wrote. "It takes non-military forms and military forms and creates a war on many fronts. It is the war of the future."

Essentially, *Unrestricted War* spelled out the implementations of the time-honored principles of Sun-tzu in the era of modern military high-technology and economic globalization. Significantly, Qiao and Wang identified, in a series of seemingly unrelated recent events, the precursors of future warfare in pursuit of the PRC's strategic aspirations.

"When people begin to lean toward and rejoice in the reduced use of military force to resolve conflicts, war will be reborn in another form and in another arena, becoming an instrument of enormous power in the hands of all those who harbor intentions of controlling other countries or regions. In this sense, there is reason for us to maintain that the financial attack by George Soros on East Asia, the terrorist attack on the US embassies by Osama bin Laden, the gas attack on the Tokyo subway by the disciples of the *Aum*

Shinri Kyo, and the havoc wreaked by the likes of Morris Jr. [the so-called “Morris worm” or Internet virus of November 2, 1988, one of the first major Internet attacks] on the Internet, in which the degree of destruction is by no means second to that of a war, represent semi-warfare, quasi-warfare, and sub-warfare, that is, the embryonic form of another kind of warfare.”

Significantly, these were not empty contemplations for the PRC, which concurrently increased both the active support for, and encouragement of, a myriad of local crises. Starting in the early-1990s, both an assertive PRC and an Iran-led Islamist world committed to the undermining of the post-Cold War *Pax Americana* while exploiting Russia’s weakness and inward preoccupation. By the mid-1990s, the first pillar of the anti-*Pax Americana* grand strategy was Beijing’s consolidation of a “Trans-Asian Axis”, the pillars of which were, and still are, China and Persia — the historic allies of Silk Route lore — and with Pakistan serving as the lynchpin between the PRC’s traditional alliance system and the Muslim World.

Around the turn of the new millennium, Beijing defined “the Vancouver-to-Vladivostok [V-to-V] *bloc*” — which unifies the predominantly White/Caucasian Judeo-Christian industrialized North — as the principal strategic challenge driving to contain the ascent of the PRC. With that, Russia has been deemed an enemy rather than a potential ally.

The second pillar was the encirclement and stifling of India, a subcontinent with an ancient civilization which would not succumb to the strategic overlordship of either Chinese or Muslim political-civilizations. Indeed, in *Can the Chinese Army Win the Next War?*, the PLA High Command defined India as “the greatest potential threat” for the PRC itself because the implementation of the PRC’s

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Trans-Asian Axis strategy threatened India's vital interests and thus might lead to a military clash. The PLA stressed that they "see India as a potential adversary mainly because India's strategic focus remains on the Indian Ocean and Southeast Asia".

In late-2000, Professor Hu Siyuan of the National Defense University in Beijing, one of the PRC's leading authorities on Indian Military Power, stressed the irreconcilable strategic differences between India and China. "India's international status and its global rôle are rather limited," Hu explained. "But India will never give up its goal of becoming a world power. And once realizing the dream of becoming a world power, India could pose a security threat to its neighbors." And the PRC is adamant of negating this trend.

Hence, starting in the early 1990s, the PRC embarked on numerous steps in this campaign, ranging from expanding the transportation infrastructure north of India, strengthening Myanmar and preparing to block the Strait of Malacca, rebuilding Sri Lanka's maritime infrastructure, helping modernize Iran's technological and military prowess, bolstering the military and nuclear potential of the PRC's closest ally — Pakistan — and to developing and consolidating the economic potential of both Pakistan and Afghanistan, and to sponsoring numerous Maoist insurgencies destabilizing India from within. In the first decade of the 21st Century, as the US escalated its war in Afghanistan as well as intensified the efforts to strategically and economically cajole Pakistan, the PRC intensified its efforts to strategically encircle and stifle India, as well as undermine its stability through Pakistan- and Chinese-sponsored terrorism and subversion.

The transformation of Pakistan into the regional power — a strategic development which has been stated to neces-

sitate the Pakistani control over the bulk of the territory of Afghanistan — would ultimately become the most important facet of implementing the PRC ascent.

Throughout, there was a palpable sense of imminent crisis and war among the key members of the PRC-led Trans-Asian Axis. Starting in early-1999, several of these key players openly declared their expectations of a future war against their neighbors and strategic foes. In early 1999, the PRC and Pakistan tested the West's tolerance of the changing strategic posture by having Pakistan launch the Kargil War in northern Kashmir. Not only was the Pakistani decision to launch the war an integral part of the PRC-inspired strategy, but the most senior officers of the Pakistani Army (led by then Chief of Army Staff Gen. Pervez Musharraf) went to Beijing for consultations on the eve of the war. The Washington-led pressure on New Delhi — the subject of invasion — to compromise lest the nuclear escalation Islamabad was threatening be put to a test, convinced Beijing that its assertive strategy was correct. This conviction was further reinforced in December 2001, when Washington once again coerced New Delhi into self-restraint after the ostensibly Pakistan-sponsored attack on the Indian Parliament which came close to assassinating the entire cabinet.

Meanwhile, starting in the late 1990s, Beijing was increasingly alarmed by numerous developments, such as the US-led military intervention in the Balkans, the growing active interests of the US and the EU in exploiting the energy reserves of Central Asia, the revival of Russia as a great power with grand-strategic pursuits, and the growing Indian assertiveness. There emerged the possibility that the aggregate impact of these separate events would be the stalling of the PRC's ascent as a continental and global hegemon.

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The PRC was initially calm regarding both US unilateral military undertakings — in Afghanistan and Iraq — since the US would not tackle the grand-strategic issues and focused only on perceived transient interests. More worrisome was the spate of the US-sponsored “color revolutions” which both Beijing and Moscow interpreted as Washington’s efforts to consolidate regional hegemony in areas they considered theirs. Thus, by the turn of the new millennium, Beijing resolved to proactively forestall all “conspiracies” and “grand designs” which might impede the PRC’s ascent. By the middle of the decade, Beijing decided to prioritize the undermining of the US strategic posture in the eastern hemisphere.

The most important driving force behind the formulation and adoption of this grand strategy was General Chi Haotian, Chief of the General Staff in 1987-92 and Minister of Defense in 1993-2003. It can be argued that these rather limited (in global perspective) strategic surges, and those that are still unfolding, are the first steps and harbingers of the PRC’s global surge outlined by Chi Haotian in the series of secret lectures he delivered to the Chinese High Command in 2003-04, at the peak of his power.

Chi’s main point was that there was an historic transformation of the PRC’s global posture. He argued that “if we refer to the 19th Century as the British Century, and the 20th century as the American Century, then the 21st Century will be the Chinese Century. ... We must greet the arrival of the Chinese Century by raising high the banner of national revitalization.” To become a global power, the PRC must reassert itself politically and militarily. In this context, Chi articulated the urgent imperative for the PRC to surge and take control over the energy and mineral resources crucial to its economic development, as well as the worldwide transportation routes. Chi went as far as antici-

pating such global struggle to escalate to a fateful war against the US which would involve the use of chemical and biological — but not nuclear — weapons against the continental US.

Chi argued that becoming a leading world power necessitated a profound shift in the PRC's involvement in world affairs. "What is a world power? A nation employing hegemony is a world power! ... All problems in China ... in the end are all problems involving the fight for Chinese hegemony." However, the war for the ascent of the PRC as a global hegemon need not be a conventional war. Rather, Chi envisaged the PRC benefitting from the aggregate impact of seemingly unrelated "incidents" and "crises" worldwide with the PRC getting directly involved only in the final decisive phase. Chi was convinced that such multi-faceted war was inevitable and a precondition for the global historic ascent of the PRC.

"Marxism pointed out that violence is the midwife for the birth of the new society. Therefore war is the midwife for the birth of China's century. As war approaches, I am full of hope for our next generation." The key element of the post-Chi PRC grand strategy was (and is) the conviction that the West had no staying power, strategic-military resolve, and ability to withstand prolonged attrition. PRC military analysis of the US/NATO war in Afghanistan stresses this point.

At the beginning of the 21st Century, the PRC focused on both nuclear and non-nuclear contingency plans for a war with the US over Taiwan which would inevitably evolve into a fateful war for the control of the Pacific and East Asia. These contingency plans would have a decisive impact on the PRC's grand strategy toward the Heart of Asia.

The turning point was a series of internal Strategy Documents authored and issued by the Military Commission of

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the CPC Central Committee between August 1999 and February 2000. At the core of these documents is Beijing's conviction that "the possibility of dramatic use of military means", including nuclear weapons, "has markedly increased". The August 1999 Document elucidated the logic for war over Taiwan. The PRC was convinced that the "American intervention" could be most destructive but not strategically decisive. Hence, "even if the situation becomes very bad" due to US stand-off strikes, the PRC "can still take control over Taiwan before the US forces reach their full strength. Then the US will be left with the option of a war of revenge like the Gulf War against Iraq or the aerial war against Yugoslavia."

Moreover, the PLA's analysis of US operations suggested that the US would be exhausted and the logistical and support system be near collapse at the end of an intense first round of operations. "After the first strike, the US forces will face problems of supplies and equipment, giving us the opportunity for great offensives and triumph in major battles." At this point, Beijing concluded, the US would have to either withdraw or cross the nuclear threshold. Either way, south-east China would have been ruined by then.

The February 2000 document stressed that point.

The US objective was to confront and contain the PRC and thus create a new Cold War-type environment. The document warned that Washington was misreading Beijing. Recent military experience had made the US complacent to the point of failing to notice that the PRC was neither Iraq nor Serbia. Therefore, a US intervention in a future war with the PRC would most likely be an air campaign. For the PRC, the document cautioned, this meant that the coastal economic and civilian infrastructure would be hit whenever the PRC reunited Taiwan by force. However, the study concluded, China should be able to with-

stand a long war because of its great strategic depth and rich strategic resources.

Ultimately, the outcome of the war with the US over Taiwan would be decided by the ability to withstand long-term attrition and tolerate mounting losses, a stoicism which had always been China's strongest point. In the Autumn of 2000, Beijing resigned to the inevitable destruction of its main economic power base in any future war with the United States. Hence, by late 2000, Beijing determined that the PRC would be able to prevail in any US military intervention aimed to disrupt the reunification of Taiwan by force if China had in place the mechanism for economic resurrection.

Therefore, Beijing resolved that in order to survive any future war, the PRC must embark on a crash building of a "behind the Urals" alternate national infrastructure.

This infrastructure — and hence the key to the PRC's ability to prevail in, and rebound from, a future US-Sino war — is in the remote western parts of China. A late November 2000 study for "the top leadership" in Beijing defined "the enormity" of the forthcoming crash program. The study stated that "the top leadership harbored a more in-depth strategic idea in making up their minds to engage in large-scale development of west China, namely, they want to break through US containment and build China into a country with strategic emphasis on its western regions". To accomplish these strategic objectives, the study stated up-front, the PRC would have to "improve China's economic structure and the environment of west China, and build ideal homes for 500-million people in these regions".

The study stressed that the imperative of the PRC's "consideration for the westward switch of its strategic emphasis is to contend for the core of Asia. Xinjiang is the heart of the

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Asian continent. The Tibet and Qinghai plateaus are China's 'Golan Heights', without which China's land territory will diminish 40 percent. Even without mentioning their abundant resources, their geographical locations alone are important enough for China to protect these two strategic heights with all-out efforts."

The study emphasized the grand strategic ramifications of the strategic shift.

"After China completes the westward switch of its strategic emphasis, the impact will expand to the Black Sea in the west and the Indian Ocean in the south. These are exactly the strategic hinterlands of Russia and India," the study pointed out. "It can be predicted that the large-scale development of west China will have a far-reaching impact on the entire region. China's relations with its two strong neighbors — India and Russia — will become very tense and unstable."

The study stressed that given the grand strategic ramifications of this strategic evolution for both India and Russia, a building confrontation with both countries was all but inevitable. "Unquestionably, geographically speaking, China's western regions average 3,000 to 4,000 meters above sea level, overlooking the North-West Asian plateau and the Indian Peninsula, both of which being the backyards of Russia and India. ... For India and Russia, this is very terrible. By then, Kazakhstan and Mongolia, which rely heavily on Russia, as well as India's neighbors Bangladesh and Burma, might possibly incline toward China. Thus, China's build-up in its western regions will be like a serious disease in the vital organs of India and Russia."

For Beijing, however, the grand strategic benefits *vis-à-vis* the United States were far more important than coping with the adverse ramifications *vis-à-vis* Russia and India.

The study argued that the principal “advantage of switching the strategic emphasis to western regions is to gain the initiative in contending with the United States. Dealing with the United States in new regions can help China get away from US containment and make the US encirclement line longer.” Ultimately, the study stressed, the fate of the PRC as a great power depended on its ability to quickly shift the strategic emphasis westward. Handling this westward surge properly “will enable China to break through the US encirclement line. In Chinese history, dynasties that successfully exercised control over Xinjiang and other western regions flourished and prospered, and dynasties that lost these regions finally met their doom. This is the strategic value of developing China’s western regions. This is also the more in-depth reason why the central authorities are using such huge resources to build ‘another China’ in western regions, whereas other political and economic objectives only serve as a foil.”

In order to implement the massive build-up of strategic-industrial infrastructure, as well as sustain operations at times of war and post-war resurrection, it was deemed imperative for the PRC to have independent energy supplies for the “behind the Urals” alternate national infrastructure.

Hence, the quintessence of Beijing’s assertive strategy throughout the Heart of Asia would become dominating the region’s energy resources and supplies while preventing all real and potential foes from either access to the energy reserves or ability to threaten the PRC’s access.

Through the Trans-Asian Axis, Beijing would be able to dominate the energy resources of the Persian Gulf, Central Asia, the Caucasus, and the Far East as well as control the on-land energy supplies to East Asia through the Pan-Asia Continental Oil Bridge. The Chinese naval build-up and

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surge was poised into the oil-rich South China Sea, and via Myanmar, also to controlling the Strait of Malacca, the main commercial sea lanes to East Asia for both oil and exports.

Beijing was, and still is, convinced, and not without reason, that the dominance over the flow of energy into East Asia could be transformed into regional hegemony.

By the middle of the first decade of the 21st Century, Beijing was amazed that the US wars remained futile and debilitating.

The US made no effort to pursue strategic goals such as the containment, let alone stifling, of Iran despite heated rhetoric about the Iranian nuclear program. Nor did the US attempt to contain Pakistan despite growing evidence of Pakistan-origin sponsorship of *jihadist* terrorism in India and the *Taliban* in Afghanistan. For the history-conscious China, most alarming was the evolution of the European Union-Russian Federation (EU-RF) relations into a genuine “heartlands” geo-strategic *bloc* projecting presence into Central and South Asia, the Middle East and North Africa. The Iran-sponsored subversion and undermining of the greater Middle East, North Africa and the Sahel proved effective in the short-term stalling of the EU-RF progress, but also incapable of reversing the predominant mega-trends. Hence, Beijing resolved to escalate and expand its own surge.

By now, the evolution of the PRC economy and patterns of industrialization necessitated the expediting of the shipment eastward of Central Asia’s hydrocarbons via the Indian Ocean in order to quickly reach the industrial zones of South-East China.

Strategically, this requires the PRC to control the same pipeline routes southward via Afghanistan and Pakistan it was accusing the US of conspiring to obtain in the 1990s.

Cognizant that its surge westward was profoundly altering the geo-strategic and geo-economic posture in Central Asia, the PRC elected to gradually revive the Russian-Chinese “Great Game” in order to contain and deter Russia from challenging its surge, thus also ameliorating the Europeans’ competitive access to the region’s energy resources. The PRC resolved to undermine the inherently pro-Russia political order in Central Asia by using the spread of *jihadism* and narco-criminality from Afghanistan and Pakistan as its primary instrument. With Russia on the defensive, there grew the local need for PRC economic and political support and, consequently, consent to the diversion of hydrocarbons away from the West.

Concurrently, the PRC intensified its surge through the Indian Ocean by exploiting the international effort to fight the pirates off the Horn of Africa. Once completed, this PRC surge westward would link-up with the growing PRC strategic-economic presence in west and central Africa. In sub-Saharan Africa, PRC intelligence is using Iran’s *jihadist* proxies, particularly within the *HizbAllah*-affiliated Lebanese-Shi’ite community, for a myriad of covert operations. The PRC objective is to consolidate strategic hegemony in order to dominate its access to and control over the regions’ vast hydrocarbon and mineral resources, as well as their safe transport to China via east Africa and the Indian Ocean SLOC.

This global pincer surge westwards comes on top of the intensifying Chinese efforts to strategically encircle and stifle India, as well as undermine its stability through Pakistan- and PRC-sponsored terrorism and subversion. The transformation of Pakistan into the regional power — a strategic development which some analysts have felt would necessitate the Pakistani control over the bulk of the territory of Afghanistan — would be the most important facet

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of implementing the PRC ascent in the Heart of Asia.

All the while, Washington's wars continued to be focused on the attainment of political instant gratification. The US strategic posture and war aims have not changed as the entire world — most notably the surrounding region — have been going through an historical grand-strategic transformation. The US has remained focused on establishing “viable political order” in Baghdad and Kabul even as the Middle East and South Asia have profoundly changed.

However, the PRC and its allies could not ignore the fact that the US and the NATO allies have been sustaining large military forces and undertakings, as well as high-cost warfare, in these theaters for close to a decade. Hence, there existed the possibility that Washington would one day discover the grand-strategic high-stakes involved and redirect the existing US and NATO forces and resources to pursuing the meaningful objectives. Such realignment would find a willing and eager partner in the EU-RF “common Eurasian home” alliance, thus creating a global posture detrimental to the PRC ascent. In this context, Beijing and its allies consider the Georgia crisis in the Summer of 2008 a milestone event because it exposed both the strategic weakness and inaction of Washington — the driving force behind Tbilisi's reckless gambit — and the decisive assertiveness of Moscow which reacted and acted as a superpower. As well, Beijing remained most furious at Washington for exploiting the PRC's time of glory — the Beijing Olympic Games — as a strategic diversion for the US anti-Russian provocation.

Currently, it seems certain that Beijing has been convinced that there emerged for the PRC a narrow window of historical opportunities between two milestones.

The first milestone is the continued US self-debilitation, now aggravated by the economic crisis in which the US is

economically beholden to the PRC and thus reluctant to act decisively.

The second milestone is the evolving ascent of the EU-RF *bloc*. Since the EU-RF heartland strategic posture would not go away, it became imperative for Beijing to cajole and/or coerce Washington to abandon its war efforts. To do this it had to prove that the war effort was unwinnable and futile, while facilitating acceptable/honorable exit and closure. Iran has already done so for the Iraq war. All the while, the PRC and its allies — mainly Iran and Pakistan — have intensified their own strategic surges in pursuit of both their own regional self-interests and furthering the PRC global grand-strategic interests. The deployment of PRC and Iranian fighters in Autumn 2010 to a joint exercise in Turkey — where they substituted for the disinvited US, Israeli, and NATO air forces — epitomizes the profound transformation of the regional strategic-military posture.

In the latter part of the first decade of the 21st Century, the PRC committed to a still unfolding strategic surge at the Heart of Asia in quest for both grand-strategic posture as well as privileged access to the hydrocarbon reserves and their transporting routes to China.

The sense of urgency was motivated by Beijing's realization that, in 2007, the PRC became a net importer of hydrocarbons after almost two decades of self-sufficiency. Energy security thus becomes an issue of paramount significance. Beijing's first priority is to restore stability in Pakistan — "our Israel", in the words of a very senior PRC official — while diminishing US influence. The PRC supports and encourages the restoration of what was perceived as the one-time Army-Islamist alliance in Islamabad. Secondly, the PRC wants to reduce the level of violence in Afghanistan in order to expedite the withdrawal of the US and NATO forces. Having sponsored a negotiated agreement

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with the *Taliban*, Pakistan would then emerge as the dominant power in Afghanistan, and the PRC would be able to build the TAPC pipelines from Central Asia to Gwadar on Pakistan's Arabian Sea (Baluchistan) coast.

To the west, the PRC is helping Iran in consolidating an anti-US posture in the Middle East based on the wave of alliances between Iran-Iraq-Syria (which delivers Lebanon and Gaza Strip) and Turkey — as demonstrated in the Autumn 2010 *Anatolian Eagle* exercise. Simultaneously, the PRC is capitalizing on the warranted and growing anxiety of the Gulf Arabs, and especially Saudi Arabia, in order to position itself as the arbiter and guarantor against Iranian attacks. The main instrument was promising Riyadh — both directly and via Islamabad — a nuclear umbrella against Iran. Toward this end, Pakistani *Ghauri-II* SSMs (1,400 mile range) deployed to the military garrison in Al-Sulaiyil, south of Riyadh, where the Pakistani crews keep conducting “exercises”.

Meanwhile, at least two nuclear warheads permanently stored in Kamra were earmarked for the defense of Saudi Arabia to be deployed on the personal instruction of King 'Abdallah bin 'Abd al-'Aziz al Sa'ud or his brother, Prince Muqrان bin 'Abd al-'Aziz al Sa'ud, Director General of Saudi Arabia General Intelligence Directorate. This arrangement also provides Pakistan with second-strike capabilities against India. This nuclear umbrella arrangement with the PRC-Pakistan has been formulated along the lines of the M-2 IRBMs agreement of 1988 which proved very successful during the 1991 Gulf war when both Pakistani and PRC crews deployed to Saudi Arabia as promised and launched a few missiles at the orders of then King Fahd.

The PRC impetus to move fast came in Spring 2009 in response to rumblings in Washington that the US ability to begin implementing a new energy policy would largely

dominate the pace and extent of the US disengagement and withdrawal from Afghanistan and Pakistan. Both Beijing and Islamabad remember that the pursuit of a TAPI (Turkmenistan-Afghanistan-Pakistan-India) pipeline led the Clinton White House to initiate comprehensive dialogue with both Pakistan and the up-and-coming *Taliban* Administration in Afghanistan. By the late-1990s, the *jihadist* supreme leadership — both the *Taliban* leadership and Osama bin Laden's inner-circle — were cognizant of the importance of the pipelines to the White House and were willing to make deals with Washington on security arrangements for both Afghanistan and an Islamist Pakistan.

The gist of the “understanding” between the Clinton White House and the *Taliban* leadership was that in return for securing the pipelines across Afghanistan and preventing the *jihadists* (particularly bin Laden) from launching strikes against the heart of the West, the US would heavily subsidize the *Taliban* Administration and would recognize its legitimacy. Numerous captured *jihadist* documents leave no doubt that since Autumn 1998 the uppermost *jihadist* leadership was fully briefed about the US-*Taliban* negotiations and that bin Laden agreed to technically abide by such an agreement should one be reached. (Indeed, the preparations for, and ultimate control over, the spectacular strike which would become 9/11 were moved to Pakistan and Persian Gulf states in order not to implicate the *Taliban*.)

Meanwhile, Islamabad insisted that TAPI be made into TAP (that is, no oil and gas be shipped to India) and instead offered the US preferential conditions for loading oil and LNG at Pakistani ports. In May 2009, the Obama White House began floating the idea that since US forces were to remain in bases and installations throughout Afghanistan for the next few years, they would be in a position to also de-

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fund and secure a TAPI-type pipeline. (The new US megabase in Dasht-e-Margo is near where key TAPI facilities were to be located.)

By then, however, the PRC was putting finishing touches on its own version of a southwards pipeline: TAPC or Turkmenistan-Afghanistan-Pakistan-China pipeline. The growing cooperation between the PRC, Iran, and Turkmenistan in the energy field is focused on the PRC's long-term plans to ship gas from both Turkmenistan and Iran to the port of Gwadar, Pakistan, where the PRC is building strategic naval facilities, and where the Iran-Pakistan (IP) and the Turkmenistan-Afghanistan-Pakistan (TAP) pipelines were originally supposed to intersect. The implementation of the PRC plans would deprive the US of the ability to construct and control a TAP pipeline. On top, there came, in early June 2009, the Iranian proposal to purchase huge quantities of gas from Azerbaijan in the context of this strategic development, thus making Azerbaijan a potential culprit in the Chinese-Iranian initiative.

On June 4, 2009, the PRC signed a deal with Turkmenistan according to which the PRC would provide \$3-billion as a "loan" for the development of the vast South Yolotan natural gas field in return for preferential access to Turkmenistan's vast reserves. The Yolotan field is located near the Afghan border. The Yolotan field likely holds at least six-trillion cubic meters of gas, making it one of the five largest deposits in the world. The PRC announced the acceleration of the construction of a 4,300-mile pipeline from Turkmenistan to China with the new timetable for the completion of construction by the end of 2009. However, with an annual capacity below 40-billion cubic meters of gas, this pipeline is already insufficient to meet all the PRC's needs. Moreover, the bulk of the PRC's increase in gas consumption is in the industrialized and urban centers along

the southern and eastern shores, and the Chinese internal pipeline network is incapable of moving the necessary quantities of gas from the north-west (the border with Central Asia) to the south-east.

Concurrently, the PRC's China National Petroleum Corporation (CNPC) signed a deal with Iran for about \$4.7- to \$5-billion for the development of the upstream sector in the offshore South Pars giant gas field. Daily production at the site would reach some 50-million cubic meters, or some 18-billion cubic meters a year. The deal is so important for Tehran to warrant the unilateral cancellation of an outstanding contract with France's Total (ostensibly because of delays in development work). However, Iranian senior officials stressed that in the PRC "Iran has found its long-sought-after partner to help develop part of the world's largest natural-gas field". Although CNPC acquired rights to use the nearby Pars LNG project and loading facilities, PRC officials indicated the PRC was apprehensive about the safety of shipping in the Persian Gulf. Hence, the PRC considers the construction of a pipeline to Chah Bahar and Gwadar — that is, a version of the IP pipeline — as the optimal long-term solution.

In its dealings with both Iran and Turkmenistan, the PRC expressed interest in buying as much gas as possible, with no questions asked and no haggling over prices. The PRC was also eager and ready to help — both financially and technologically — with the construction of the TAP and IP pipelines to the gas liquefaction facilities they have been planning to build in Gwadar.

The PRC success is potentially a mortal blow to the US and the West's strategic posture in the region. The PRC is the closest special ally of Pakistan and is willing to rely on Pakistan for furthering the PRC's own strategic objectives. The construction of a TAPC pipeline would require PRC

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and Pakistani dominance over the entire route from Kushka on the Afghanistan-Turkmenistan border to Gwadar. As well, Iranian dominance is imperative in the Herat area. Significantly, the original motive for the creation by the Pakistani Inter-Services Intelligence (ISI) — with the US Central Intelligence Agency — of the *Taliban* movement, at the behest of the US in the mid-1990s, was to control the Kushka-Herat-Qandahar-Quetta road and secure the then-anticipated construction of TAPI.

Many observers believe that Pakistan could restore control over these routes quite quickly and effectively. That could be achieved by the ISI's reaching out and openly allying with its former allies and protégés; that is, the tribal and *jihadist* forces now spearheading the war against the US and NATO forces, as well as ceasing the war against the tribal and *jihadist* forces inside Pakistan. Such an initiative would significantly reduce the level of anti-US and anti-NATO violence in Afghanistan, reduce the *jihadist* insurgency in Pakistan's tribal lands, but it would also seal the fate of the Hamid Karzai Administration in Afghanistan as a viable ostensibly-pro-US entity. It has always been Islamabad's strategic position that such deals and cooperation were preferable to the perpetual unwinnable fighting the US is coercing the region to undertake. Now, it could be construed, the PRC patronage — motivated by geo-strategic and geo-economic considerations — provides Pakistan with the formal excuse and political protection to drastically change its policy.

In December 2009, Beijing consolidated its first strategic victory in the new energy struggle.

Chairman Hu Jintao embarked on a triumphant trip in energy-rich Central Asia. In Ashgabat, he chaired an energy summit with the leaders of Kazakhstan, Uzbekistan, and Turkmenistan. As part of the summit, the four presidents

inaugurated a new 1,200-mile pipeline connecting the Turkmen gas fields with China's Xinjiang region. This was the first operational component of the Pan-Asia Continental Oil Bridge, the system of pipelines connecting the north-west PRC with the three countries which were due to become fully operational in 2012. In his speech, Hu stressed that the opening of these pipelines constituted the beginning of a "long-term comprehensive strategic relationship" between the PRC and the states of Central Asia.

Meanwhile, the PRC demand for oil increased at a record pace in 2010, jumping by 7.1 percent compared to the same period in 2009. In late 2010, oil imports accounted for 55 percent of available supplies for the economic-industrial market. There was also an increased demand for natural gas. By late 2010, imports soared to approximately 15.3-billion cubic feet of LNG, a 30 percent increase relative to the same period of 2009. Significantly, the underlying cause of this increased demand was the sustained economic growth. This increase also means increased reliance on oil and gas imports, making the security of oil and gas supplies an issue of paramount importance for Beijing.

Moreover, forecasts prepared for the US Defense Department in late 2010 predicted that the PRC would import almost two-thirds of its oil by 2015 and four-fifths by 2030. The change in LNG consumption was expected to be even more dramatic. In late 2010, oil met nearly 20 percent of the total energy consumption in the PRC, while gas accounted for three percent. According to PRC projections, gas was expected to constitute 10 percent of the energy use by 2020. And while the PRC has been expanding the drilling in the South China Sea (with tremendous security challenges due to the PRC's unilateral territorial demands), there is no substitute to the growing volumes of imports and strategic storage of hydrocarbons.

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Furthermore, in late-2010, Beijing committed to the accelerated construction of the second phase of its strategic petroleum reserve: a key element of the “behind the Urals” alternate national infrastructure. When completed in late-2011, the national reserves would hold around 45-million tons of crude oil. The first phase of the strategic petroleum reserve was completed in 2009, holding some 26-million barrels. Beijing stressed that this storage of oil “aims to ensure the availability of supplies during extraordinary circumstances”; that is, the possible future war with the US in which the economic-industrial basin in south-east China will be destroyed.

Meanwhile, by the middle of the first decade of the 21st Century, as the US George W. Bush Administration was becoming more assertive in stressing the US right to unilaterally go to war, Beijing became increasingly apprehensive about the consequences of the escalating US face-off with the PRC. There was renewed apprehension in Beijing about the possibility of confrontation with the US over the growing PRC assertiveness and ascent, particularly in relation to Taiwan or the Heart of Asia, escalating into US bombing campaigns. Given the immense strategic value of Afghanistan and Pakistan, the PRC’s intelligence community reportedly found it incredulous that the US would just walk away from such a crucial region once “the *al-Qaida* threat” had been removed.

Hence, the Central Military Commission (CMC) and the PLA High Command focused anew on preventing and deterring the US. In 2004, on instruction from Hu Jintao (by then President of the PRC and Chairman of the CMC), the PRC tacitly adopted the doctrinal tenet first conceptualized by Jiang Zemin back in 2002 (then President of the PRC and Chairman of the CMC). “China developed strategic nuclear weapons, not to attack but for defense,” Jiang ob-

served. The PRC's nuclear forces are "a kind of great deterrent toward nuclear weapons states and makes them not dare to act indiscriminately".

Indeed, in 2005, the Second Artillery Corps introduced new "command and control decisionmaking during a joint campaign" principles that raised the possibility of using nuclear weapons in response to the new generation of hi-tech weaponry the US might use in a future war with the PRC. Formally, however, as articulated in two authoritative doctrinal statements issued in 2006 and 2008, the PRC remained beholden to the no-first-use policy. For example, the 2006 Science of Campaigns notes specified that the PRC would launch nuclear counter-strikes "only after the enemy implements a nuclear strike against us" so that Chinese nuclear strikes would only be "implemented under nuclear conditions".

However, as the PRC grand-strategic ascent and assertiveness are adversely affecting US vital interests both in the Heart of Asia and in North-East Asia, there emerged the imperative for Beijing to clearly warn the US against escalating any regional crisis to even non-nuclear strikes against the PRC or its military forces (on the high seas, in the Korean Peninsula, or while invading Taiwan). In Autumn 2010, this crucial doctrinal change was made official with the issue of a Central Military Commission document containing instructions to the Second Artillery Corps titled "Lowering the Threshold of Nuclear Threats". According to the Commission's document, the Second Artillery Corps "will adjust the nuclear threat policy if a nuclear missile-possessing country carries out a series of air strikes against key strategic targets in our country with absolutely superior conventional weapons".

The document further instructs that the PLA "must carefully consider" a nuclear response to conventional-

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weapon attacks on PRC sovereign territory (a definition which includes all lands and ocean-spaces unilaterally claimed by the PRC). The document specifies that non-nuclear strikes against any “leading urban centers” as well as “atomic or hydroelectric power facilities” could now trigger a nuclear counter-strike.⁴³ Moreover, any non-nuclear strikes deemed “an existential threat to the Chinese government” or “crucial interests” warrant nuclear retaliation. Fearing confusion, the document stresses that the Second Artillery Corps “must strictly follow” the orders of the Central Military Commission and “must not adjust” its nuclear stance independently, that is, in accordance with the PRC’s publicly stated doctrine.

Presently, Beijing is observing the West’s resolve as an indicator of what’s ahead for the PRC’s own global ascent.

If the US leads an expedited withdrawal — as the Obama White House yearns to do — the US would not only hand over the venue to a region of crucial importance for the energy security of the West, especially Europe. Such a withdrawal would also confirm Beijing’s conviction about the US’s vulnerability to attrition and prolonged conflicts to the point of giving up vital strategic interests rather than committing to open-ended military commitments. It has therefore become imperative for Beijing to test the US resolve and commitment to the Heart of Asia.

PRC grand strategy is characterized by historic long-term and broad vista. Implementation is characterized by miniscule-yet-irreversible steps.

The West often misses the nuanced maneuvers and undertakings until it is too late. A priority strategic objective

43 The PRC’s Three Gorges Hydro Dam, by itself, has more than four times greater electric power generation capacity than the entire Western Australian south-west system (22,500MW *versus* 5,500MW). Aside from the massive loss of life and disruption from the wall of water, should this dam be breached by military strike, the removal of it would shut down a large section of the PRC grid, which is why it warrants such escalation threats in PRC nuclear strategic doctrine.

of the PRC has been to stifle India, the historic nemesis. India is China's irreconcilable foe because the five-millennia-old Hindu civilization would never tolerate hegemony by the comparably old and proud civilization. The current Indo-PRC face-off over the Indian Ocean, the Heart of Asia and, ultimately, leadership of the developing world are merely contemporary manifestations of this age-old enmity. In this dynamic, Pakistan is the PRC's instrument of choice and closest ally. Facilitating and assisting Pakistan's ascent and consolidation of control over much of Afghanistan not only strengthens Pakistan, but also improves the PRC's own energy supplies while blocking India's access to energy resources in Central Asia and Iran.

PRC strategic thinking is that the US and NATO presence in the region is a major irritant which has to be defeated and banished. As a result, the PRC must be expected to continue bolstering its presence in South Asia, attempting to dominate Pakistan, and empowering, at least in some ways, the *Taliban* in the process.

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Appendices

Appendix i

A Floating Alternative to Nabucco Undercuts Potential Disruptions to EU Energy Supplies and Reduces Turkish Leverage Potential Against the EU⁴⁴

By **Yossef Bodansky**

IF _____, Romania, Azerbaijan, and Georgia finalized an agreement on the direct export of Azerbaijani natural gas to Romania. This has profound ramifications for halting Turkey's ability to hold the EU hostage to energy supplies via Turkey, and offers far more rapid easing of European energy pressures.

The new agreement calls for transporting the Azerbaijani gas via pipelines to the SOCAR-owned Kulevi terminal on the Georgian coast of the Black Sea. From there, the liquefied gas will be shipped across the Black Sea by tankers to new terminals in the Romanian port of Constanta. From Constanta, the gas will be distributed through the Romanian pipeline system. "In five years' time, Romania will become an energy hub in its geographical region thanks to this project," predicted Tudor Serban, the Secretary of State for Romania's Ministry of Economy, Commerce, and Business Milieu.

This agreement is aimed primarily at ameliorating Romania's near-total dependence on natural gas delivered by the pipeline from Russia via Ukraine. During the Winter of 2008-09, Romania suffered disproportionately as a result of the Ukrainian-Russian gas crisis, when Ukraine disrupted the flow of gas to Europe via Ukrainian territory in order to avoid paying its debt to Russia. Hence, it became imperative for Romania to diversify its sources of gas supplies in order not to be so vul-

44 From *Defense & Foreign Affairs Special Analysis*, April 6, 2010.

nerable in future crises. Moreover, given Romania's own economic crisis, Bucharest cannot afford to purchase and store huge reserves, and therefore any disruption in ongoing gas supplies will have an immediate impact on Romanian customers.

Hence, the Romanian interest in, and commitment to, all previous alternatives to the pipelines via Ukraine. Romania is an active participant in the Nabucco pipeline project despite its growing problems and diminishing viability. As well, Romania has expressed a growing interest in the Russian South Stream pipeline, and, with the volatile Government of Bulgaria having growing problems with Russia over energy security issues, Romania is increasingly emerging as the entry point of the South Stream into the EU.

This approach is shared by the European Union's (EU's) Office of the Commissioner of Energy. In early 2010, the EU launched quick and profound changes such as a declared willingness to support South Stream. This policy change amounts to the EU virtually abandoning Nabucco, at least until a viable southern route, via Armenia rather than Georgia, is secured and the Azerbaijan-Turkey price dispute is resolved. In contrast with Nabucco, South Stream is a concrete project and in 2015, by the time it goes on line, its capacity will be four times the anticipated initial capacity of Nabucco, and twice the potential capacity if Nabucco is fully upgraded. Furthermore, Russia and Italy, the main stakeholders in South Stream, have expressed interest in integrating the inner-European gas transportation and supply system in order to achieve increased flexibility at a significant reduction of redundancy and thus cost.

Still, both pipelines — Nabucco and South Stream — are years away from completion. With Romania's vulnerability to the disruption of gas supplies via Ukraine painfully clear, Bucharest resolved to seek a quicker alternate source of natural gas and delivery, hence the just concluded agreement with Azerbaijan and Georgia.

Although Bucharest signed the agreement in order to address Romania's own immediate energy problems, this agreement has the potential to become a major contribution to the overall long-term energy security of the EU.

The present agreement between Romania, Azerbaijan and Georgia covers the transportation of between seven- and 20-billion cubic meters of gas a year depending on Romania's own market needs. Initially, Nabucco is expected to transport 15-billion cubic meters a year, and, if the second-phase upgrade is implemented, Nabucco's maximal capacity will hit 31-billion cubic meters per year. If properly expanded, the Azerbaijan-Georgia-Romania route can thus become a viable replacement for the failing Nabucco: that is, a major source of natural gas transported into the EU outside Russian control. This factor — the di-

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versification of suppliers and routes — has always been the sole purpose for Nabucco and the intense support it enjoys from the US. Since Azerbaijan was to be the primary source of natural gas for Nabucco, this project actually returns to the original alternate supplies as envisaged by the US.

Nabucco is presently an excellent engineering idea without any gas to transport. Because of the consortium's excessive demands for international guarantees that Russia does not attack the feeding pipeline on Georgian territory under any circumstance (Nabucco itself will start inside the Turkish territory), it is highly unlikely such a pipeline will be built or existing pipelines be converted to carry gas for Nabucco.

Simply put, not without reason, Russia refuses to have its military leverage and right to self-defense neutralized by, and held hostage to, the mere existence of the Nabucco feeder pipeline. The Kremlin has repeatedly declared that Russia has no interest in bombing pipelines on Georgian territory. Indeed, Russian forces refrained from bombing the pipelines and pumping stations during the August 2008 war. However, the Kremlin insists on reserving the right to bomb the hydrocarbon transportation infrastructure in Georgia as an instrument of deterring the volatile and unpredictable Tbilisi from instigating a new crisis.

In the absence of a negotiated solution to the Nagorno-Karabakh conflict respecting the territorial integrity of Azerbaijan, the prospects of a more viable southern-route feeder pipeline via the Arak River valley and Nakhichevan are virtually non-existent. Moreover, the long-term disagreements between Turkey and Azerbaijan over the pricing of the gas for Nabucco make the availability of Azerbaijani gas for Nabucco highly unlikely.

Originally, Azerbaijan was to be the prominent/primary source of gas for Nabucco, a point which was stressed by the US George W. Bush White House. The other potential substitute sources of gas for Nabucco are not viable. Iran (and Turkmenistan via Iran) is still hostage to the US-led sanctions, and in Iraq the energy infrastructure remains hostage to the escalating Arab-Kurdish-Turkoman disputes and sporadic fighting. Indeed, in August 2008, Kurdish terrorists blew up the natural gas line from Georgia, in eastern Turkey.

Official denials and protestations notwithstanding, Ankara is holding Nabucco as a hostage and instrument of pressure on the EU in order to expedite Turkey's accession to the EU without Turkey's meeting numerous preconditions (particularly judicial and human-right reforms and the question of Turkish military occupation of another EU country, Cyprus). Since the major EU states are adamantly opposed to Turkey's joining the EU, a major crisis with Turkey is inevitable. It is inconceivable that, should Nabucco exist at that time, Turkey will not shut down Nabucco at a time of major crisis in order to pressure the EU into

concessions. Both Ankara and Brussels are cognizant of this scenario, and Brussels is therefore adamant on preventing such EU vulnerability by reducing the EU's future use of Nabucco if it is ever constructed.

In contrast, the new trans-Black Sea shipping route provides potential for a viable substitute to Nabucco.

The gas pipeline from Baku to the Kulevi Black Sea port can be covered by the current understandings between Azerbaijan and Russia because Azerbaijan owns the terminal facilities. Significantly, these understandings already withstood the August 2008 war. On the other side of the Black Sea, natural gas can be shipped from Constanta via existing pipelines into the original system envisioned for Nabucco, as well as be shipped by barges up the Danube and into Europe's canal-and-river system. A barge-based transportation system can go into operation far faster than pipeline construction, thus enhancing Europe's energy security and diversifying suppliers more rapidly than originally anticipated.

Moreover, Azerbaijan is ready to commit the gas originally earmarked for Nabucco, and Turkmenistan is willing to reconsider support for and future export via a Trans-Caspian Pipeline (TCP).

The expansion of the Azerbaijan-Georgia-Romania natural gas transportation route meets the primary precondition which prompted the original US support for, and sponsorship of, Nabucco: namely, natural gas transportation system free of Russian control. At the same time, this route does not suffer from any of the debilitating shortcomings of the proposed Nabucco pipeline. Therefore, the Azerbaijan-Georgia-Romania route should be considered the viable, faster and cheaper alternative to Nabucco.

Appendix ii

A New Strategic Framework Emerges Gradually, Post-Georgia, in European, Russian, and Central Asian Energy, Marginalizing the US⁴⁵

By Yossef Bodansky

The Georgia Crisis which broke into the open with the Georgian military assaults on South Ossetia on August 8, 2008, ushered in a new era in global energy economy and security. Moreover, the overall strategic posture throughout Eurasia has already been affected by the Georgia Crisis and its political, military and economic aftermath.

The calendar — the coming Autumn and Winter in Eurasia — is adding urgency to the European imperative to resolve and consolidate the new energy economy and security posture.

Rhetoric notwithstanding, it is clear throughout the official West that Georgia was the aggressor and that Russia won a strategic victory. The harsh US anti-Russia language cannot conceal the fact that the United States could neither dissuade a protégé-state — Georgia — from launching a military provocation against Russia, nor intervene and save it once Russia reacted with fury. The US impotence was most glaring concerning the vital energy pipelines in the Caucasus.

The Russian air strikes near the pipelines in Georgia, coupled with the sabotage of these pipelines in Turkey by US-sponsored Kurdish terrorists (whom Washington also failed to restrain), delivered a clear message to the EU leadership: the US is incapable of securing the “alter-

45 This report appeared in *Defense & Foreign Affairs Special Analysis*, September 23, 2008.

nate source” pipelines (long advocated by the Bush White House as a major strategic objective) against regional threats. Meanwhile, the Shanghai Cooperation Organization (SCO) Summit in Dushanbe reiterated the Kremlin’s hegemony over access to the energy resources of Central Asia and the pipelines carrying them westward.

Consequently, the EU leadership resolved that Russian domination of Europe’s energy sources and transportation, despite its political price, is preferable to vulnerability to disruptions wrought by irrational and unpredictable local forces. There is a growing apprehension in Brussels about wildcard local forces — a “new [Georgian Pres. Mikhail] Saakashvili” — provoking a regional crisis that results in disruption of supplies. The Kremlin, in contrast, is perceived as logical and trustworthy, and the EU can negotiate and make long-term deals with Russia.

At the same time, the Georgia Crisis and the Kurdish sabotage demonstrated anew the physical vulnerability of pipelines to disconnection by both fighting and terrorism. Irrespective of the political-strategic posture of the pipeline-system, this security aspect — the vulnerability of the pipelines — must also be addressed. Hence, the preferable next step, as far as the EU leadership is concerned, is the marked expansion and diversification of a web of interconnected pipelines in order to ensure uninterrupted flow of gas and oil even if some of the pipelines are disconnected due to war, terrorism or mechanical failure.

In a nutshell, the EU has no intention to risk a cold and/or expensive winter in order to further the anti-Russia policies of the Bush White House.

Regional leaders throughout the Greater Black Sea Basin (GBSB) have been quick to grasp the new strategic-economic reality. In contrast, the US Bush Administration is still striving to coerce the local leaders into participating in the efforts to punish Russia and pressure Europe into following US leadership. US Vice-Pres. Richard Cheney’s heavy-handed treatment of Baku on September 3-4, 2008, during his visit to the GBSB and Italy was a key component of the US policy.

Vice-Pres. Cheney delivered Washington’s demand that Baku commit to the acceleration and expansion of gas and oil deliveries to Europe through demonstrably non-Russian venues in order to have both political and economic impact. The US, however, would neither guarantee the EU’s endorsement of such US-driven energy policies, nor guarantee the physical security of the pipelines called for by this US policy.

The new strategic-economic reality in the GBSB was hammered to Washington by local leaders, most notably Azerbaijan Pres. Ilham Aliyev in his meeting with Vice-Pres. Cheney. Pres. Aliyev made it clear that Azerbaijan was not ready to start a conflict with Russia on behalf of anybody, be it the US or Georgia. Baku was apprehensive about the US’ professed inability to provide pipelines’ security beyond political pres-

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sure. Moreover, having consulted Brussels, Baku was not going to defy its prime customer — the EU — by insisting on pipelines outside Russian access and/or influence. On the contrary, Baku would support the integration of the proposed Nabucco natural gas pipeline (to transport gas originating in the Caspian region, via Turkey to markets in Europe) and other pipelines into the Russian-dominated energy transportation network.

Soon afterwards, Pres. Aliyev traveled to Moscow for what Russian senior officials called an excellent meeting with Pres. Dmitry Medvedev. Moscow was most forthcoming to Baku's energy policy concerns. Pres. Medvedev assured Pres. Aliyev that Russia would encourage agreements between Azerbaijan, Turkmenistan, and other Central Asian states on transporting their gas and oil via Azerbaijan for as long as the pipelines used are integrated into the Russian-dominated network.

Pres. Medvedev also offered Russia's good offices in mediating a solution for the Nagorno-Karabakh conflict outside the framework of the stalled Minsk Process while guaranteeing Azerbaijan's territorial integrity. This was a major achievement for Baku, given the inherent danger in using Moscow's recognition of the secession of Abkhazia and South Ossetia as a precedent for Nagorno-Karabakh.

By now the EU leadership also concluded that Nabucco might have viability only when integrated with other venues of supply, namely, the Blue Stream pipeline from Russia. Sofia's acceptance, in mid-September 2008, of the "mini-Nabucco", pushed forward a strategic decision for the entire EU.

The transformation of Nabucco — the erstwhile symbol of the US-sponsored, anti-Russia pipeline efforts — into an integral component of the Russian-dominated web of pipelines is the most explicit example of the dramatic transformation of the EU energy transportation and security doctrine in the aftermath of the Georgia Crisis.

Simply put, Sofia's commitment to the mini-Nabucco made the consolidation of the Russian-dominated web of pipelines irreversible. Indeed, senior EU officials stressed that the uppermost EU leadership is cognizant of the great service provided by Bulgarian Prime Minister Sergey Stanishev to the overall EU grand-strategy when he committed to the mini-Nabucco.

Other regional powers are also cognizant of the unfolding profound changes. For example, the budding Turkish-Armenian *rapprochement*, which symbolically started with Turkish Pres. Abdullah Gul attending a football/soccer game in Yerevan, was driven first and foremost by the evolving regional energy transportation priorities. While in Yerevan, Pres. Gul offered to help defuse the Nagorno-Karabakh conflict while preserving the territorial integrity of Azerbaijan.

Pres. Gul stressed to Armenian Pres. Serzh Sarkisian that this approach to conflict resolution was now being pushed by both Paris and Moscow. Significantly, Pres. Gul's newly-found enthusiasm for resolving the Nagorno-Karabakh conflict was prompted by the regional pipeline strategy. The solution of the Nagorno-Karabakh conflict would permit the construction of the cheaper and shorter Southern Route pipeline from Baku to Erzurum, where it could be integrated with the Blue Stream pipeline. Such a pipeline route avoids Georgian territory.

Meanwhile, the EU leadership is also interested in the acceleration and expansion of the Southern Stream pipeline from Russia to Bulgaria and into the heart of Europe. Since this project does not involve third-parties, the pace of construction and implementation is controlled by engineering and financial considerations. Hence, official Brussels is convinced these could be resolved between Moscow and Sofia, with, should the need arise, assistance from Brussels. Moreover, this is a most tempting project given the new agreements between Russia and the gas-producing states of Central Asia which provided Russia with a virtual monopoly over the availability of gas for the European market.

Once again, Sofia is coming to the rescue of the EU. The expediting of a refined and expanded South Stream project was agreed upon in the summit in the Russian Black Sea resort town, Sochi, on September 19, 2008, between Russian Prime Minister Vladimir Putin and Prime Minister Stanishev. Both sides agreed to capitalize on the new facets of the energy economy, particularly the regulated supplies from Central Asia via Russia and the European preference for cooperation with Russia. "Preconditions for the implementation of the [South Stream] project are improving," Prime Minister Putin told Prime Minister Stanishev. The new strategic-economic posture, Putin added, "raises the attractiveness of South Stream". In response, Prime Minister Stanishev agreed that the South Stream project had a strategic significance for both Russia and Bulgaria. He further stressed that it was important to begin construction as soon as possible. The EU leadership was now anxious for the pipeline construction to begin.

As well, the new strategic posture led to a major rethinking of the viability of the proposed White Stream pipeline from Azerbaijan and Georgia to Bulgaria, either on the bottom of the Black Sea (a technologically complex and most expensive option) or via Crimea (a major political challenge). The EU now insists that a future White Stream would be viable only with Russian supervision. Under such conditions, an expanded South Stream might make the very expensive White Stream on the bottom of the Black Sea superfluous. However, a pipeline stretching via the Crimea — where it could also feed into the central European pipeline system — would be economically tempting but politically ten-

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uous.

A lot will depend on the outcome of the political crises plaguing Ukraine. The consolidation of a flagrantly anti-Russia Government in Ukraine — now openly pushed by the Bush White House — is likely to doom the White Stream project, at least for the time-being.

All these developments make Sofia a major energy hub for southern and central Europe. Bulgaria is the projected meeting and integration hub of gas pipelines from across the Black Sea and via Turkey, and then the distribution of the gas to numerous areas throughout Europe. Sofia's dominant rôle and centrality in the Eurasian energy strategy and economy are manifested in the forthcoming energy summit in Sofia, now scheduled for Spring 2009. Leaders from Europe and Central Asia agreed to gather and jointly address the new energy economy and security strategies and posture in the emerging Eurasian *Bloc*, especially in the post-Georgia Crisis environment.

The Sofia summit will be a milestone event given the profound changes already unfolding.

In their Sochi summit, Prime Minister Putin assured Prime Minister Stanishev that Russia would contribute to the success of the Sofia energy summit. Moscow “will take an active part in this work,” Putin told Stanishev. “We are glad that Russia will take a most active part in preparing the conference due in the Spring of 2009,” Stanishev responded. “Without Russia's participation it is hard to imagine the conference to be a success.” Senior EU leaders also envision active participation in, and contribution to the success of, the Sofia energy summit.

In Conclusion

The profound transformation of the Eurasian energy economy and security in the aftermath of the Georgia Crisis is not lost on official Washington, and particularly the Bush White House.

On the political surface, the Bush White House continues to put on a brave face, most recently by Secretary of State Condoleezza Rice in her address to the German Marshall Fund in Washington, DC. Sec. Rice repeatedly and harshly criticized Russia's “use of oil and gas as a political weapon” beyond the Georgia Crisis. She stated that for the Bush White House, “the attack on Georgia has crystallized the course that Russia's leaders are now taking and it has brought us to a critical moment for Russia and the world”. Sec. Rice stressed the wide range and long-term objectives of the Bush White House in response to the Georgia Crisis. “Russia's invasion of Georgia has achieved — and will achieve — no enduring strategic objective. And our strategic goal now is to make clear to Russia's leaders that their choices could put Russia on a one-way path to self-imposed isolation and international irrelevance.”

Beyond the fact that these objectives outlined by Sec. Rice are unat-

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tainable because European, Chinese, and other powers have no intention of following the *diktats* of the Bush White House, official Washington itself is far from committed to supporting the policies articulated by Sec. Rice. Major foci of power in official Washington are leery about the Bush White House and its penchant for escalating the face-off with Russia and Europe. Ultimately, however, Washington has lost institutional interest in foreign policy, particularly long-term and principled issues. Washington is preoccupied with the acute crisis of the US economy, the conclusion of the key Congressional session, and the last sprint toward the Presidential and Congressional elections in November 2008.

Appendix iii

The Global Energy Security Framework: Searching for a New Conceptual Matrix⁴⁶

By Gregory R. Copley

The phrase “energy security” has become short-hand to signify whether our existing and anticipated supply chain for energy is running smoothly. That matter — the smooth operation of the energy supply chain — in reality, however, is a second-tier logistical issue. The real question is whether our societies are secure in a more holistic sense. Energy is merely a vital part of the complex diet on which we are dependent.

What is critical in a world in which societies are in transformation is whether or not we can meet massively expanding expectations and ambitions.

It has always been true, throughout history, that societies will absorb almost any degree of deprivation provided that this deprivation is accompanied by a commensurate lack of hope. Once hope is injected into the equation, and the slightest change in circumstances occur for the better, then expectations always grow dramatically ahead of any possible supply options. That is how and why revolutions occur. They rarely occur in times of abject depression and challenge, but almost always occur when things are getting better. The French, Russian, Iranian, and even the American revolutions all occurred under such circumstances

⁴⁶ These remarks were prepared for the First Annual Roundtable on Energy Security in the Indian and Pacific Ocean basins, an event sponsored by the International Strategic Studies Association (ISSA), publishers of *GIS/Defense & Foreign Affairs* in Perth, Western Australia. The closed-door event was held in Perth on August 22, 2008.

of rising expectations, as did, for example, the Chinese revolution of 1911.

And now, for most of the world — except Europe, North America, Australia, and Japan — we see large numbers of people in many different societies expecting and demanding improvements to be delivered in their lives at a pace faster than their governments can deliver. This expectation is fueled by a global media pervasiveness which highlights the possibilities which can theoretically be attained by all, but which realistically cannot.

And given that all of our expectations for better life are dependent on the delivery of on-demand energy in a multitude of forms, how then can energy security be achieved in a modern, transforming world in which expectations will, for the foreseeable future, outstrip demand? Moreover, how can we address ways of getting ahead of market expectations — expressed as absolute needs — if all we do is focus on the finite growth capacity of existing supply chains and existing technologies?

If we fail to get out ahead of the seemingly inexhaustible growth in demand then we certainly see the prospect for social unrest, expressed in varying forms — particularly around the Indian Ocean and Pacific Ocean basins, where change and growth is now endemic in various patches — including those expressions of discontent which emerge as demand for better, cheaper food. If rising expectations, which become profound rights, are not met, and economic wealth not constantly increased and spread around the large populations of the PRC, India, and Iran, then we will see profound social unrest and revolution, in one form or another.

Indeed, it is worth noting that the Iranian revolution of 1978-79 occurred exactly because the economy, education, and social condition were becoming relaxed and more positive, and the Shah could not deliver results rapidly enough, just as the previous and current Indian governments cannot deliver results rapidly or evenly enough to a population fueled now by great expectations. Significantly, the Iranian *ayatollahs*, after 1979, absolutely understood that they must, *à priori*, stamp down any expectations of joining the modern world in a better life. They succeeded in this for three decades. Now, however, they are facing a new paradigm, in which openness to the world, and increasing wealth, will fuel a revived set of social expectations which cannot be met.

This, then, will be the time of great danger for the Iranian clerics.⁴⁷

47 The immediate result of the transforming strategic situation which has begun to remove economic and access constraints with regard to the Iranian economy will be rising, but uneven, wealth growth in Iran. Iran's moves to build new domestic oil refining capacity will unleash consumer demand. Domestic consumer demand has until now been suppressed as the clerics acquired and stockpiled imported re-

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We can, at the same time, expect different versions, in differing intensities, of this theme to play out in India, Pakistan, Indonesia, and other places. One of the key differences, however, is that in India, Pakistan, and Indonesia, for example, social repression or containment has not existed in anything like the manner as in Iran and, until recently, in the PRC. Thus the effect of released and inflated expectations emerging from Iran and the PRC, and some other societies, is more dramatic and explosive, while the leadership hierarchies of these states is also more singular and brittle, whereas in complex societies — what we can call democracies, although they may not all be of totally similar structure — there are many, ongoing outlets for frustration, gradually absorbing societal unrest.⁴⁸

Clearly, any relaxation of social containment, and any improvement in outlook, for the people of the Democratic People's Republic of Korea — North Korea — will equally fuel a revolution which is at presently only barely contained. North Korea's leaders are fully aware of this, as are the PRC leaders who fear a growing surge of North Korean refugees streaming into China.

The unleashing, particularly in the Indo-Pacific basins, of social expectations for more and better food, more and cleaner water, and more and more benefits of modern life, is why demand, for the first time since the beginning of the petroleum age in the late 19th Century, is surging so profoundly that the marketplace is screaming that it is not the type of energy source which is important, it is merely the delivery of electrical and motive power to the end consumer.

fined fuel (having exchanged it for Iranian crude). Additional wealth will also be generated for the élites through the growth in liquefied natural gas (LNG) exports, possibly seeing Iran emerge as the second largest gas producer/exporter in the world, with 150-million cubic meters a day of gas for export to Europe via pipelines. This export capacity will presumably transit via pipelines through Armenia and Georgia and the Black Sea hub. Indeed, the US decision to relax sanctions against Iran is also key to India, which sees Iran as the major supplier of oil and gas in the future, one reason why India has failed to compete so energetically for oil and gas in the West African marketplace. Iranian Petroleum Minister Gholam-Hossein Nozari, speaking at the July 2, 2008, 19th World Petroleum Congress in Madrid, said that, by 2014, Iran's oil output would rise to 5.3-million b/d, over its current output (4.2-million b/d in 2008). Natural gas output, he said, would rise to 1.5-billion cubic meters a day from the current 540-million cubic meters a day. Iran would, he said, invest US\$141-billion on new energy projects between 2005 and 2014, with some \$63-billion of that investment being provided locally. Moreover, it seems clear that the climate in Iran for international investment would improve following the US decision — essentially the State Department position — to recognize and support the clerical leaders, postponing, but not eliminating, the threat to the clerics' profound control from an increasingly restive population.

48 See Copley, Gregory: *The Art of Victory*. New York, 2006: Simon & Schuster's Threshold Editions. Chapter Eight: "Abstraction, Complexity, and Victory". In this, Maxim Eight notes: "Organically evolved complexity defines and sustains victory".

With that, the reality is that “energy security” today is not about the hydrocarbon supply chain; it is about innovation.

While we are mesmerized by the growing energy consumption of the People’s Republic of China (PRC) and the vast initiatives upon which Beijing has embarked to secure oil, gas, and coal from Australia, the Middle East, and Africa, we have yet to consider the strategic implications of the looming collapse in the productivity of what was in 2006 the world’s sixth-largest oil producer, Mexico. Not only is Mexico, with Canada and the Gulf of Guinea (essentially Nigeria), one of the three top suppliers of oil to the US market, it is also the great and uneasy partner in North American social trends.

Mexico is a critical element of the Indo-Pacific regional security environment we are considering today. A collapse in the Mexican oil export capability will profoundly impact the artificial economic bubble in which Mexico has been existing, and this will export a myriad of social and economic problems to the United States.

Like many of the elements in the complex matrix which we will discuss today, the Mexican energy watershed is a creature of human invention. Mexican Governmental greed and reluctance to open the society to appropriate levels of partnership with the international investment market have determined that there has been inadequate exploration for new reserves of oil and gas, and inadequate investment in energy exploitation.⁴⁹

The Mexican example is critical because it absolutely impacts on the world’s largest economy, which itself has a direct bearing on the ability of the great markets of Asia, including Japan, the People’s Republic of

49 This writer published a report on July 14, 2008, entitled “Mexico’s Energy Outlook Has Potential to Transform by 2012”, noting that the confluence of under-investment in existing oil fields, a lack of sophisticated technology and declining production rates had the potential to result in Mexico transitioning from being a major exporter of crude oil to a net importer, as early as 2012-2014. Mexico, like many other key energy producing nations, had benefitted from the sharp rise in the price of oil due to large domestic reserves. The increase in revenues from the international sale of crude oil has facilitated high levels of government spending and the avoidance of serious structural issues, as well as immediate problems, such as rising food prices and the implications of a potential US slowdown. Mexico has, by law, made the state-owned *Petróleos Mexicanos* (PEMEX) the sole entity responsible for all of the nation’s oil production. It is not allowed to partner with foreign oil firms, depriving it of sophisticated technology which could boost production of its declining oil fields. Furthermore, it is being used as a “cash cow” by its owner, the Mexican Government, and funds are not being reinvested in exploration at an adequate rate to build reserves. While this policy is of benefit in the short-term — at present its dividends cover 40 percent of all federal spending— these factors may see Mexico rapidly surrender its status as the fifth largest oil exporter in the world. In the medium-term, there is even potential for Mexico to have to import oil as major domestic fields start to experience a rapid decline in production rates.

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China, the Republic of Korea, and India, among others, to weather the emerging economic storms. Moreover, the growing and tight relationship of energy supply to strategic stability issues is such — particularly in the Indo-Pacific basins — that long-term structural damage could occur to our societies from our inability, or unwillingness, to strenuously address stabilizing and corrective measures.

The challenge today, then, is how we broaden our perspectives on energy security, because it is critical that we develop a new, holistic approach — a grand strategy approach which takes account of a whole range of global trends — in how we view this critical area of our stability and progress.

We cannot any longer have the luxury of viewing our energy needs merely as a linear extrapolation of our past needs and approaches.

More importantly, energy is at the core of the matrix which determines the stability, survival, motivations, and actions of the major trading nations. Energy is a topic which cannot be strategically discussed in isolation, and this is the new paradigm we must now always consider.

The immediate and direct strategic linkages between energy, food, water, social stability (and economic trust and asset value), and therefore strategic power are now more profound and global than ever before, thanks to emerging technology, population growth and — very importantly — wealth growth, and the globalization of markets and trends. This is the indissoluble matrix which we need to define; it is the physical core of the grand strategy framework.⁵⁰

We are in such a confluence of strategic trends that the fragility of the mutually-dependent global condition is evident. Thus, containment of any potential for disruption to national stability must increasingly be in the hands of individual nation states, working in concert with key trading partners to ensure a dampening of any negative consequences of economic or resource-flow reversals.

This is why the collapse of the Doha Round of the World Trade talks could not have come at a better time. This collapse began the inevitable return to the process of giving sovereign power back to the nation-states.

The demand for energy is a key component in delivering on social demands for more and better food, more and cleaner water, better creature comforts, such as cars, gadgets, and airline travel, and so on. What goes unexpressed, but which is more important, is the stability of asset values, and therefore currency worth.

If we fail to deliver the end requirements demanded by various societies, then social unrest and economic dislocation will ensue in key

50 Parts of this appeared in the article, by this writer, entitled “The Energy-Food-Water-Security Matrix”, which appeared in *Defense & Foreign Affairs Strategic Policy*, 6-2008.

markets. Indeed, this process is already evident. And if major economic collapse or dislocation occurs, and societies regress, then resource and energy supplier states, such as Western Australia, suffer the consequences. Thus, Western Australians, for example, have a key stake in ensuring that Indian and Chinese consumers are satisfied, quite apart from any concerns which may exist that unrest in the People's Republic of China (PRC) or India could feed international competition and conflict.

Nowhere is this linkage between energy, food, water, social stability and economic trust and asset value, and strategic power more sensitive than in the world's key dynamic region: the Indo-Pacific oceanic basins. Australia is very much at the epicenter of the processes now evolving. Australia may — just by relying on luck and the hope that others are taking care of business — continue to fly; or it could become a major victim of a global hiatus in markets and security; or it could inoculate itself against some of the probable pain and build a solid base for future growth and security.

Considerable attention has been paid to the possible impact on the global condition of an economic dislocation in the PRC, or India. The consequences for the PRC's — and, to a lesser extent, India's — major trading partners, such as Australia, would be profound. This is obvious, and immediate. But little attention has been paid to the precursor dislocation of resource supply to the PRC, for example, and particularly the dislocation of energy supplies, with other mineral resources in an important second place. This concern — including the potential vulnerability of Australia's energy pipelines and structures — was highlighted by this author and his colleagues in the 2005 Future Directions International (FDI) study, *Australia's Energy Options*, and then in the December 2007 FDI study, *Australia 2050: An Examination of Australia's Condition, Outlook, and Options for the First Half of the 21st Century*.

At this point in history, growing and more widely spread wealth has pushed us into a lazy, linear view and implementation of concept and ideals, such as free trade, a philosophy which indeed can do much to stabilize societies and give impetus to innovation through competition. But such philosophies — like any ideals — cannot exist or thrive in a sterile or pure environment. Thus, reality has intervened and brought about the collapse of the Doha Round of the World Trade talks, because India and the People's Republic of China could not agree to withdraw protection for their farmers.

This “reality check” should be welcomed by Australians, not because Australians wish to see those giant markets of India and China denied its exports, but because Australia — like the US — cannot afford to see the Chinese and Indian economies collapse because they were not yet ready to compete. And they will not be ready to compete until they can

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more completely and economically automate, and that is a process which requires industrialization on a greater scale, and therefore demands more energy.

Twenty-first Century mankind, more than any other age of humanity, understands the integral connection between societal survival and all forms of energy. Food equals energy, and *vice-versa*, in the sense that food provides the energy for human life and action. Human energy has always been an important aspect of food production. Now, to a profound degree, non-human forms of energy; modern energy for want of a better descriptor — powering automation, computerization, value-added scientific progress, and much more — make the production possible of endlessly multiplying quantities and qualities of food.

This was not true to this extent at any time in historical experience. The same significance can be said of the rôle of water to enable — and to energize — human life. Human and other forms of energy increasingly transform landscapes to move water to where it is needed, or transform non-potable water into potable fuel for human activity, including agriculture. Once, mankind went where water was; now water can go where man wishes.

This great engineering of water, too, is increasingly becoming a viable reality because of energy and automation, not directly linked to human physical effort or human numbers.

The greatest human discovery may well have been the realization that creating energy through secondary, or abstract, means, such as transforming combustible material into heat or transforming hydrodynamic flow into electricity or milling and other industrial actions — and progressing from there — allowed all of the great achievements which have continued through history.

History has proven that mankind can produce as much energy — and therefore foodstuffs and potable water — as the expanding population requires, by moving from one energy source to the next with increasing exploitative skill. History has also proven that the powers which triumph through history are those which have access to, and use, the most energy, not even necessarily with the greatest efficiency. In any event, the links are undeniable: energy is food; energy is water; energy is productivity; energy is communication; energy is transportation; energy is — by transmutation through light, books, societal wealth, and so on — knowledge capable of passage across time and space. Energy, therefore, equals civilization.

Thus, in almost all respects, energy equates to survival and security. And yet most modern “energy security” discussions revolve solely around the availability of hydrocarbons or the direct capture of natural forces such as sun, wind, and tide. It is now time to take a more holistic view, particularly in the Indian Ocean and Pacific Ocean basins, where

the most dynamic energy markets are also among the most active producers of goods and services. Moreover, in many of the markets within these emerging, dynamic strategic zones, there is little buffering between energy availability and output capability, and almost no buffering between the availability of energy/food/water — the inseparable matrix — and asset value, and therefore social cohesion.

APEC, the Asia-Pacific Economic Cooperation forum linking 21 states, has an energy working group. The working group states as its main premises: “Short-term measures include improving transparency of the global oil market, maritime security, implementing a real-time emergency information sharing system and encouraging Member Economies to have emergency mechanisms and contingency plans in place.” And “Long-term measures include facilitating investment, trade and technology cooperation in energy infrastructure, natural gas (including LNG), energy efficiency, clean fossil energy (including carbon capture and geological sequestration), renewable energy and hydrogen and fuel cells.”

Clearly, however, the “energy security” matrix which we really need to contemplate must embrace a far broader and more multi-disciplined contextual approach than those being considered under the simple, separate rubrics of energy supply, and food and water security for communities. And the linkage of energy supply to population numbers cannot merely be a linear extrapolation based on present consumption numbers and anticipated population growth. Population patterns are becoming increasingly complex, even within societies, as factors such as urbanization and food and water usage patterns vary constantly as wealth patterns themselves transform.

We know, for example, that global population levels will soon peak at under 10-billion — they have already jumped from 2.5-billion in 1950 to 6.38-billion today — and probably begin to decline before mid-century. We know that urbanization processes continue to become more interesting, and potentially more unstable; and so on, and certainly more dependent on energy production on scales not before achieved.

Of course the transition from one form of energy regime to another, when taken on a global scale, will cause disruptions. It also did so when the movement from whale oil to petroleum transformed first the shape, wealth, and capabilities of societies, and then navies (which were enabled to move away from coal-fired ship engines over a period of about 50 years). Then air transport and air power were totally enabled by the petroleum age. Quite apart from the petroleum contribution to motive power, the late 19th and 20th centuries were transformed by petroleum because of electrification (which evolved from coal, and then was compounded by petroleum-fired power generation), spurring all manner of advances from electrical lighting and machinery power to telecom-

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munications.

So the societal upheaval caused initially by the move away from whale oil gave us the kind of productivity and reach we have today. The results were mostly, but not entirely, beneficial for society. And yet the competition for whale oil between Britain and France led to the establishment of colonial outposts in South-Western Australia, at Albany, literally providing the foundations for the Swan River colony.

The next generations of power production forms, which will be diverse, overlapping, and of varying efficacy, will be equally transforming, many in ways which are not yet fully clear. Certainly, lower carbon emissions will be just one attribute of new energy developments, but the impact of the changing energy-food-water-security matrix is becoming evident in both positive and negative ways right now.

We see the “green” movement promoting the desirability of using “renewable” resources — trees — in papermaking, but the same movement now spurns the use of renewable resources — agricultural growth, whether corn or other forms — in power generation, because the short-term impact of energy costs and demands on food costs has been believed to be disruptive. And yet there has been no direct linkage proven to say that food supply chain issues are caused by the growth of some corn or sugar crops solely for the biofuels market.

The question, in any event, is moot as to whether rising petroleum costs are more damaging to societies than rising food costs: they are both part of the same equation. Indeed, the recent rise in petroleum costs can be ascribed as much as 20 percent to panic in the markets over the perceptions of unrest in the Niger Delta, which was itself born out of political and constitutional frustrations which have direct parallels to Australia’s current debate over state-federal relations. Moreover, the politics of oil in Nigeria both drove and diverted people away from agriculture and food production over the past half-century, just as the resource sector has lured Australia and Australians away from their pride in their agricultural genius. [The current decline in oil prices at the wellhead can also in part be ascribed to the fact that the Niger Delta crisis has disappeared from the headlines, although not from reality.]

Perhaps US taxation breaks which reward some farmers for ploughing-under unprofitable crops are mechanisms which could be removed legislatively, allowing the high market prices for food to ensure that cornfields will be harvested and sold.

The answer is not that bio-fuels should be curtailed to help reduce the current and sudden rise in food costs, because it is doubtful that this, indeed, would be the result of abandoning ethanol production from corn. Rather — as with all emerging technological processes — the question is how quickly bio-fuels can be created more efficiently, while ensuring that energy can contribute to the efficacious develop-

ment of water resources.

The circle of energy production to create food, and bio-fuel to help in agricultural production and water distribution, is increasingly apparent. What is less apparent are the underlying population trends — and the politics and short-term and often unarticulated ambitions of those populations — induced by wealth and lured by the globalized vision of the wealthy ease of an apparently-attainable, and yet chimeric, post-industrial lifestyle.

It is true that most reactive journalism cannot see the importance of long-term strategies when “the sky is falling,” and political upheavals can result from short-term disruption in food supplies.⁵¹ The answers, in the fairly short-term, need to include a resolution of the spurious arguments against genetically-modified crops so that greater supplies of food — and other agriculturally-produced goods — can be delivered where they are needed. Farmers, through breeding of animals and plants, have been modifying crops since the origination of agriculture enabled the construction of cities and the birth of what we can call human history. According to the entirely city-based “green” advocates, genetic modification of crops and animals is acceptable if carried out on farms, but not if a laboratory is involved.

But apart from reconsidering GM foods and agriculturally-produced fabrics and fuels, we can also begin transforming energy production with new thorium-based technologies — already being pursued in

51 As the populist US academic, Jeffery D. Sachs, noted in *Scientific American* in the June 2006 edition: “In early 2006 a metric ton of wheat cost around \$375 on the commodity exchanges. In March 2008 it stood at more than \$900. Concurrently maize went from around \$250 to \$560. Rice prices have also soared.” Sachs, whose tendency is to blame all such outrages on the US Bush Administration (and its attempts to stimulate bio-fuels development), did, however, also note that “World incomes have been growing at around five percent annually in recent years, and four percent in *per capita* terms, leading to an increased global demand for food and for meat as a share of the diet. The rising demand for meat exacerbates the pressures on grain and oilseed prices because several kilograms of animal feed are required to produce each kilogram of meat. The grain supply has also been disrupted by climate shocks, such as Australia’s massive droughts.” The selective application of logic ignores the reality that Australia’s droughts are by no means constant (and the 2008 crops may actually be high), and the reality that global wealth increases may be the single greatest contributor to rising food costs, as well as increases in petroleum costs. As well, rising petroleum costs are equally impacted by lack of adequate investment in refining capacity to cope with the adequate stocks and supply of crude oil. The Australian production of all winter crops was, in June 2008, forecast by agricultural analysts at the National Australia Bank to increase by 66 percent in 2008-09 over 2007-08, to 37-million tonnes; of this, Australian wheat production was forecast to reach 24.3-million tonnes in 2008-09, up from around 12-million tonnes the year before. Hardly the declining production which Sachs and others have noted. And similar situations are evident elsewhere. Clearly, then, the problem of rising food prices has more at its roots than declining food supply and rising oil prices.

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the US and Australia — to produce lower-temperature, low-pressure power Producers. A single mini thorium power Producer will be able to generate enough power for a town of, say, 5,000 people: 10 megawatt units of electricity for 10 years for far less per megawatt of output than any comparable source now available.⁵² These mini-energy plants will have no carbon output, and produce very little waste, and even that waste has a short half-life.

These units could be in production in five to 10 years. Given the reality that Western Australia holds the world's largest reserves of thorium (India has the second-largest), these thorium Producers could start being deployed along the Australian coastline, pumping energy into dispersed communities, and also desalinating and pumping sea water inland to germinate new agricultural output.

So the energy revolution is now afoot, and the integral linkage with water and food supply — and therefore social stability, robust economic growth, and conflict minimization — is at our fingertips. This is one of the great opportunities for the positive transformation of a range of major challenges to global and regional stability, given the fact that cheap, stable power can transform social, and therefore political, situations.

When we talk, then, of “energy security”, it must be in the broadest context, and must embrace a dynamic loop which looks at global (and country-by-country) population levels, urbanization patterns and ensuing political and value and wealth outcomes, food production, the opportunities and timescales dictated by science and technology budgets, the direct requirement for energy to be part of the water solution, and so on. It is also necessary to understand the fact that the urgency of situations varies from country to country depending on the closeness of the linkages between political stability and food/water/energy shortages. Indeed, the linkage between food/water/energy and population wealth and education then have a flow-on effect with regard to inward investment, and so on.

The ultimate determinant is whether the “dynamic loop” is balanced, or whether, because of uneven rising wealth patterns and media-driven social expectations or some other dislocation of an element in the loop, social unrest is triggered. This has already happened in the PRC, and places like Iran and India. It will happen increasingly in these places. And this can and will drive policy decisions which can lead to re-

52 The use of thorium for power generation has been proven by viable light-water thorium reactors since the 1970s, but the new approaches to the use of thorium for medium-temperature (300 to 500 deg. C), low-pressure (and therefore low cost) energy Producers was first outlined by this writer in the *Australia's Energy Options* study, led by Gregory Copley and produced by Future Directions International, on October 6, 2005.

gional conflict.

However, by adopting, for example, the new thorium and other energy options, we can insulate our society to a great degree against fluctuating markets and regional security upheavals.

We are on the verge of a revolution, and all the turbulence which accompanies such an upheaval. We can make this a “glorious revolution” in which we secure our destiny.

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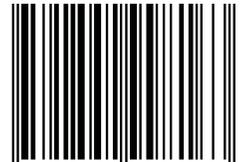
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