



The Contemporary Concept of Energy Security

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Abstract

The debates over energy security in the 1970s, having burgeoned amidst the transformation of energy markets following the oil shocks, were at the time mostly based on narrow geopolitical and economic views related to the security of a reliable and affordable supply. Since then, the meaning of energy security has evolved and come to encompass a broader range of considerations. This Contract Report is intended as a survey of the debates over energy security in their contemporary form. The discussion revolves around two interrelated themes: first, the complexity of the concept of energy security and the overlapping but at times disparate debates that occur around the concept; second, the differing policy interventions that follow from attempts to render energy more “secure.” The purpose of this Report is to highlight how the politics surrounding the concept of energy security in a contemporary setting influence policy intervention(s), and the implications of the policy choices therein. Given the persistent saliency of energy security in public and political debates in recent years, it is crucial to find ways for coherent discussions over comprehensive sets of policy choices to take place and help deal with this issue.

Résumé

Les débats sur la sécurité énergétique ont proliféré au cours des années 1970 dans la foulée de la transformation des marchés de l'énergie qui a fait aux chocs pétroliers. Ils reposaient alors sur des conceptions étroites de la géopolitique et de l'économie concernant l'accès garanti à des approvisionnements fiables et abordables. Depuis, la signification de la sécurité énergétique a évolué et englobe désormais un large éventail de considérations. Le présent rapport se veut un bilan des débats modernes sur la sécurité énergétique. La discussion porte sur deux thèmes interdépendants : premièrement, la complexité du concept de sécurité énergétique et les débats parfois redondants, parfois discordants qui l'entourent; deuxièmement, les interventions stratégiques diverses qui découlent des tentatives visant à mieux « garantir » l'approvisionnement. Le rapport a pour objectif de mettre en relief la façon dont les politiques liées au concept de sécurité énergétique dans un contexte contemporain influencent l'intervention politique. Il traite également de l'incidence des choix politiques. Étant donné la place prépondérante que n'a cessé d'occuper la sécurité énergétique dans les débats publics et politiques au cours des dernières années, il faut absolument trouver le moyen de favoriser un débat cohérent sur un ensemble de choix politiques complet dans le but de faire avancer cette question.

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Executive summary

The Contemporary Concept of Energy Security:

Simon Langlois-Bertrand; DRDC CORA CR 2010-148; Defence R&D Canada – CORA; July 2010.

Over the past few years, discontent from a surge in oil prices, increasing potential for geopolitical instability stemming from intense competition over access to energy resources, and sustained environmental concern over the extensive use of fossil fuels, have brought energy back to the forefront of the political debate. Discussions over energy security in the 1970s, having burgeoned amidst the transformation of energy markets following the oil shocks, were based on narrow geopolitical and economic views related to the security of a reliable and affordable supply. Since then, discussions have evolved to encompass a broader range of considerations, recognizing the complexity of energy security. This complexity has critical implications for policy choices.

This Contract Report is intended as a survey of the debates over energy security in the contemporary period. The discussion revolves around two interrelated themes: first, the complexity of the concept of energy security and the various overlapping, but at times disparate, debates that take place; second, the differing policy interventions that follow from attempts to render energy more “secure.” The purpose of this Report is to highlight how the politics surrounding the concept of energy security in the contemporary setting influence policy intervention(s), and the implications of these choices therein.

After a short introduction to the topic in Section 1, Section 2 provides a brief overview of issues pertaining to energy security, focusing on their evolution since the early 1970s, as background to understand where the roots of contemporary discussions lie. What emerges from this brief overview are a few key differences between current debates and ones that took place in the previous four decades. First, there is widespread opposition to analysts who argue that energy security can be “solved” by military action, even if these military considerations still dominate the debates. Second, an important part of the opposition to military solutions consists of market-based arguments, an element reinforced by the sustained domination of free trade and by the rapid financial developments in international energy markets. And, third, two decades of debates and negotiations on environmental and sustainability concerns linked to energy use have given strength to all-encompassing, or holistic, views on energy security. These views illustrate how far-reaching the impact of energy and energy security related policy decisions are on societies.

Section 3 identifies and discusses the difficulties facing attempts to define and conceptualize energy security. The key question is why energy security appears to be such a malleable concept. The considerable divergence in the debates makes it hard to draw a single, or simple, conclusion. There is general agreement over the fact that energy security means different things for different actors (those actors being states in most discussions). Energy security is thus an umbrella term, mixing energy concerns with economic growth, environmental issues, and political power. This produces a “politics” of energy security, and consequently a range of choices over how to approach the problem, based on different needs, different interests, different beliefs of what the problem is, and, thus, different policy solutions.

Section 4 focuses on different views on the energy “problem,” and illustrates how these views influence policy choices. In this section the report underscores the shortcomings of simplified approaches to energy in the contemporary context, which in turn impact energy security. The first approach detailed is a geostrategic view that considers energy security as a foreign policy and military problem. This view focuses on how energy affects national security and international relations, and emphasises the importance of geopolitics in a world where energy is a resource subject to competition. The bottom line is that while this approach has strong appeal, its limited focus on oil and gas, and on competition between states, oversimplifies issues related to securing energy supplies. Mitigation strategies are often reduced to diversification, and the militarization of the problem tends to order issues in a hierarchical manner, relegating other important concerns.

The second approach views energy security as an economic and technological problem. It is drastically different than the first in its assumptions about the underlying dynamics of international energy markets. This difference does not lie in the level of analysis and actors involved: rather its proponents, while not fundamentally denying the relationships forged by geopolitics, contend that in discussions over the problem of energy security, the focus should be put on the characteristics of international energy markets. The logical extension of this approach is that energy security is, at its core, an economic pricing problem, even if it a sizeable one. Furthermore, advocates of this view argue that a focus on interdependence, rather than competition, produces a more cooperative search for solutions. The recognition that energy markets are integrated underscores the importance of engaging rising energy consumers—especially China and India—to deepen this integration, and of improving the management of the complexity of this interdependence. Under this approach it makes less sense to talk about the energy security of a particular country, despite the importance of states as the main players, because energy security can only be achieved in a global context.

The following subsection focuses on environmental aspects in energy security discussions in recent years. Environmental considerations are arguably the most broad-reaching addition to debates over the complexity of energy and of its security component in academic and policy circles. Here, proponents attempt to demonstrate that not only is energy security—and energy use generally—more complex than zero-sum geopolitical competition, as the economic approach also suggested, but that the “totality” of energy in our lives also make it critical to reassess completely the impact of energy use on the world we live in. In this context, a holistic view results in an understanding of the complexity of energy and leads to debates concerning ‘real’ security implications of the totality of energy use. In sharp contrast with the geostrategic approach, and to a lesser extent the economic approach, commentators adding environmental considerations question the fundamental underlying assumption that oil and gas are the appropriate proxy to discuss energy matters: environmental concerns, in their broadest sense, provide an explanation as to why the use of this proxy in energy security debates is misleading, as it takes the socio-technical system as given, precluding discussions based on alternatives to fossil fuels. The arguments based on environmental concerns thus enrich the debates over how to design policies to ensure energy security. However, in acknowledging the enriching nature of a holistic approach, environmental approaches do not convincingly eliminate short-term pressures or points brought out by the more traditional analyses of the first two approaches, because oil and gas are likely to dominate international markets in the immediate to medium-term future.

Section 4 ends with a discussion of the contradictions inherent to policy interventions based on those approaches. While there are some overlapping policy solutions, it needs to be kept in mind

that choices favouring certain outcomes frequently hold the potential of worsening other aspects of the energy and/or security environment. These tradeoffs underscore the importance of goal definition and by extension the policy choices that are made. The section concludes with a few examples of more “sophisticated” policy approaches to deal with energy security, and of the social choices that they imply.

The main conclusion from this Report is recognition of the general need to bring together the various approaches to energy security. Given the complexity of “energy” and “energy supply,” the tendency to simplify in political discourse suggests terms like energy security will continue to be used, but their real meaning may not be clear to all actors. With regard to importing countries, of which most of the industrialized world and increasingly larger parts of the developing world consist, transparent and comprehensive discussions appear to be the only way for societies to make some hard choices about their energy future.

Sommaire

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Au cours des quelques dernières années, le mécontentement attribuable à une poussée des prix du pétrole, l'instabilité géopolitique de plus en plus menaçante en raison de la concurrence féroce face à la disponibilité des ressources énergétiques ainsi que les préoccupations d'ordre environnemental qui durent face à l'épuisement des combustibles fossiles ont ramené l'énergie à l'avant-plan du débat politique. Les débats sur la sécurité énergétique ont proliféré au cours des années 1970 dans la foulée de la transformation des marchés de l'énergie qui a fait suite aux chocs pétroliers. Ils reposaient alors sur des conceptions étroites de la géopolitique et de l'économie concernant l'accès garanti à des approvisionnements fiables et abordables. Depuis, la signification de la sécurité énergétique qui a évolué et englobe désormais un large éventail de considérations reflète la complexité de la sécurité énergétique. Cette complexité à des incidences importantes sur les choix politiques.

Le présent rapport se veut un bilan des débats modernes sur la sécurité énergétique. La discussion porte sur deux thèmes interdépendants : premièrement, la complexité du concept de sécurité énergétique et les débats parfois redondants, parfois discordants qui l'entourent; deuxièmement, les interventions stratégiques diverses qui découlent des tentatives visant à mieux « garantir » l'approvisionnement. Le rapport a pour objectif de mettre en relief la façon dont les politiques liées au concept de sécurité énergétique dans un contexte contemporain influencent l'intervention politique. Il traite également de l'incidence des choix politiques.

Après une courte présentation du sujet à la section 1, la section 2 propose un bref aperçu des questions relatives à la sécurité énergétique, axé sur leur évolution depuis le début des années 1970. Cet aperçu sert de contexte pour comprendre l'origine des discussions d'aujourd'hui et met en évidence quelques différences clés entre les débats actuels et ceux tenus durant les quatre dernières décennies. Premièrement, les analystes qui avancent qu'il est possible de « résoudre » la question de la sécurité énergétique au moyen d'une intervention militaire suscitent l'opposition générale, même si ces considérations militaires dominent encore les débats. Deuxièmement, l'opposition aux solutions militaires repose en grande partie sur des arguments axés sur le marché, un élément renforcé par la domination permanente du marché libre et l'évolution rapide de la situation financière des marchés internationaux de l'énergie. Et, troisièmement, deux décennies de discussions et de négociations sur les problèmes environnementaux et de durabilité attribuables à la consommation de l'énergie ont donné du poids aux conceptions holistiques, c'est-à-dire globales, de la sécurité énergétique. Ces conceptions illustrent l'importance que prennent les décisions politiques relatives à l'énergie et à la sécurité énergétique dans les sociétés.

La section 3 expose et explique les difficultés associées aux tentatives visant à définir et à conceptualiser la sécurité énergétique. La principale question consiste à savoir pourquoi le concept de sécurité énergétique semble si malléable. En raison des divergences considérables qui

caractérisent les débats, il est difficile de tirer une seule ou une simple conclusion. On s'accorde généralement sur le fait que la sécurité énergétique signifie différentes choses pour différents intervenants (ces intervenants étant les États dans la plupart des discussions). La sécurité énergétique est donc un terme générique qui associe les préoccupations concernant l'énergie à la croissance économique, aux questions environnementales et au pouvoir politique. Il en découle une « politique » de la sécurité énergétique et, par conséquent, un ensemble de choix quant à la façon de gérer le problème qui se fondent sur différents intérêts, sur différentes perceptions du problème et, donc, sur différentes solutions stratégiques.

La section 4 traite des divers points de vue sur le « problème » de l'énergie et illustre comment ils influencent les choix politiques. Dans cette section, le rapport souligne les lacunes des conceptions simplifiées de l'énergie dans notre contexte moderne, ce dernier influant de son côté sur la sécurité énergétique. La première conception présentée consiste en un point de vue géostratégique selon lequel la sécurité énergétique relève d'une politique étrangère et constitue un problème militaire. Ce point de vue met l'accent sur la façon dont la question de l'énergie influence la sécurité nationale et les relations internationales, et il insiste sur l'importance de la géopolitique dans un monde où l'énergie est une ressource soumise à la concurrence. Bien que cette conception soit très séduisante, le fait qu'elle porte uniquement sur le pétrole et le gaz ainsi que sur la concurrence entre les États entraîne une simplification exagérée des questions relatives à l'assurance de l'approvisionnement en énergie. Les stratégies d'atténuation se réduisent souvent à la diversification, et lorsqu'on militarise le problème, on a tendance à classer les enjeux par ordre hiérarchique, reléguant ainsi les autres problèmes importants à l'arrière-plan.

Selon la deuxième conception, la sécurité énergétique est un problème d'ordre économique et technologique. Cette conception est fondamentalement différente de la première par ses hypothèses concernant la dynamique sous-jacente des marchés internationaux de l'énergie. La différence n'a pas trait à la profondeur de l'analyse ou aux intervenants concernés : c'est plutôt que ses tenants, sans nier complètement l'existence des relations fondées sur des facteurs géopolitiques, soutiennent qu'il faut axer les discussions ayant trait au problème de la sécurité énergétique sur les caractéristiques des marchés internationaux de l'énergie. Il découle logiquement de cette conception que le problème de la sécurité énergétique, même s'il est de taille, est essentiellement un problème économique lié à l'établissement des coûts. En outre, les défenseurs de cette conception avancent qu'en mettant l'accent sur l'interdépendance plutôt que sur la concurrence, on favorise davantage la collaboration menant à des solutions. Reconnaître que les marchés de l'énergie sont intégrés, c'est insister sur l'importance de mobiliser les nouveaux grands consommateurs d'énergie – surtout la Chine et l'Inde – afin de renforcer cette intégration et de mieux gérer la complexité de l'interdépendance. Selon cette conception, il est moins pertinent de parler de la sécurité énergétique d'un pays en particulier puisque la question de la sécurité énergétique ne peut se régler que dans un contexte mondial, bien que les États demeurent les principaux intervenants.

Le paragraphe suivant porte sur les aspects environnementaux apparus dans les discussions sur la sécurité énergétique au cours des dernières années. Les considérations d'ordre environnemental constituent sans doute l'ajout le plus notable au débat sur la complexité de l'énergie et de la sécurité énergétique dans les cercles universitaires et les milieux politiques. Les partisans de la conception dont il est ici question s'efforcent non seulement de démontrer que la complexité de la sécurité énergétique – et de la consommation de l'énergie en général – dépasse la concurrence géopolitique à somme nulle, comme l'avancent également les défenseurs de la conception

économique, mais que l'énergie « totale » dont nous avons besoin pour vivre rend aussi essentielle la réévaluation complète de l'impact de la consommation d'énergie sur le monde dans lequel nous vivons. Dans ce contexte, une conception globale permet de comprendre la complexité de l'énergie et donne lieu à des débats au sujet des conséquences « réelles » de la consommation totale d'énergie sur la sécurité. Fortement en opposition avec la conception géostratégique et, dans une moindre mesure, avec la conception économique, les commentateurs qui prennent en compte des considérations d'ordre environnemental remettent en cause l'hypothèse fondamentale sous-jacente selon laquelle le pétrole et le gaz sont un indicateur approprié pour discuter des questions d'énergie. Ils soutiennent que les préoccupations d'ordre environnemental, dans leur sens le plus vaste, expliquent que l'utilisation de cet indicateur dans les débats sur la sécurité énergétique induit en erreur, puisqu'il tient pour acquis le système socio-technique, excluant ainsi les discussions fondées sur les autres combustibles fossiles. Les arguments reposant sur les préoccupations d'ordre environnemental enrichissent donc les débats à propos de la façon de concevoir des politiques en vue de garantir l'approvisionnement en énergie. Toutefois, même si elles reconnaissent qu'une conception globale enrichit les discussions, les approches environnementales ne permettent pas, de manière convaincante, d'éliminer les pressions à court terme ou de réfuter les arguments soulevés dans les analyses plus classiques associées aux deux premières conceptions, puisque le pétrole et le gaz vont vraisemblablement continuer de dominer les marchés internationaux à court et à moyen terme.

La section 4 se termine par un examen des contradictions inhérentes aux interventions stratégiques fondées sur ces diverses conceptions. Bien que certaines solutions stratégiques se recoupent, il ne faut pas oublier que les choix favorisant certains résultats sont souvent susceptibles de nuire à d'autres aspects de l'énergie et/ou du contexte de l'approvisionnement. La nécessité de compromis met en lumière l'importance de définir les objectifs et, par extension, les choix politiques qui sont faits. La section se conclut par quelques exemples d'approches stratégiques plus « perfectionnées » visant à gérer la sécurité énergétique et de choix sociaux qu'elles supposent.

La principale conclusion du rapport est la reconnaissance du besoin généralisé de regrouper les diverses conceptions de la sécurité énergétique. Compte tenu de la complexité de « l'énergie » et de « l'approvisionnement en énergie », la tendance à simplifier ces questions dans le discours politique laisse croire que des termes comme « sécurité énergétique » continueront d'être utilisés sans que leur signification réelle soit nécessairement bien comprise par tous les intervenants. En ce qui concerne les pays importateurs, dont font partie la plupart des pays industrialisés et de plus en plus de pays en développement, les discussions transparentes et globales semblent être la seule façon d'amener les sociétés à faire certains choix difficiles au sujet de leur avenir énergétique.

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1 Introduction

Over the past few years, discontent from a surge in oil prices, increasing potential for geopolitical instability stemming from intense competition over access to energy resources, and sustained environmental concern over the extensive use of fossil fuels, have brought energy back to the forefront of the political debate. Discussions over energy security in the 1970s, having burgeoned amidst the transformation of energy markets following the oil shocks, were based on narrow geopolitical and economic views related to the security of a reliable and affordable supply. Since then, discussions have evolved to encompass a broader range of considerations, recognizing the complexity of energy security. This complexity has critical implications for policy choices.

What can strike even an experienced reader in energy security discussions is the confusion over what the term actually means. A quick survey of papers will produce a wide variety of areas of debate, from resource wars to free trade, and from state intervention to sustainability. Moreover, definitions of the term, when specified, diverge considerably, as can be witnessed by the myriad of “what does it really mean?” opinions written in recent years.¹ The question, “what is energy security?” is critical given the prominence of contemporary policy discussions about securing energy requirements in the future. These disparities in understanding and conceptual framing are somewhat worrying, and underline the importance of understanding the different dimensions involved in any discussion of energy security.

This report is intended as a survey of the debates over energy security in their contemporary form. The discussion revolves around two interrelated themes: first, the complexity of the concept of energy security, because of the overlapping, but at times disparate, debates that take place; second, the differing policy interventions that follow from attempts to render energy more “secure.” The purpose of this report is to highlight how the politics surrounding the energy security concept in the contemporary setting influence policy intervention(s), and the implications of these choices.

The next section of this document provides a brief background of issues pertaining to energy security, focusing on their evolution since the early 1970s, in order to understand where the contemporary discussions take root. Section 3 identifies and discusses the difficulties facing attempts to define and conceptualize energy security, hence explaining why energy security is such a malleable concept. Section 4 focuses on different views on the energy “problem” and illustrates how these views influence policy choices in order to underscore the shortcomings of simplified approaches to energy in the contemporary context, which in turn impact energy security.

It is worth noting that this is a summary overview for debates as rich and complex as the ones taking place over energy security. This report focuses on what appear to be the main arguments in the academic and policy literature. Unless specified, the examples used in this report are not necessarily meant to be representative of a tendency or particular view. The report is intended to

¹ See for example Pierre Noël, “Is Energy Security a Political, Military, or Market Problem?” *Financial Times*, 10 January 2008; or Sebastian Mallaby, “What ‘Energy Security’ Really Means,” *The Washington Post*, 3 July 2006, p. A21.

provide the reader with a summary of the debates taking place today, their origin, and their political implications.

2 Background

A glance at a typical 1970s book discussing energy security provides the casual reader with striking similarities to the issues under discussion, how those issues are treated, arguments advanced, and policies recommended in a book published after 2000. After the first and second oil shocks, terms such as the “oil weapon” and “peak oil,” among numerous others, can be found in most publications on the topic, regardless of the year they were written. These similarities should not overshadow the evolution of the debates over energy security since the 1970s, however, as new and more complex arguments were put forth by contributors from various backgrounds over the last four decades. The purpose of this section is neither to give a full historical account of energy security and related debates, nor to detail the transformation of the energy industry over that period, although both of these dimensions are summarized. Rather, this section is intended to provide a general sense of how discussions over energy security have emerged and evolved since the beginning of the 1970s, in order to understand where the current debates come from.

In many ways, the early 1970s (pre-1973 embargo) saw the rapid culmination of trends that could be traced back to the end of World War II. First, the Western bloc’s sustained economic growth was fuelled by a rapid and continuous increase in consumption of U.S. oil. Second, there was an important restructuring of ownership rights on oil production, starting with sharing agreements between producing countries and international oil companies and evolving into nationalization, especially following the creation of the Organization of the Petroleum Exporting Countries (OPEC) in 1960. Finally, the emergence of the Middle-East as the future main region of oil production completed the picture. The 1970-1973 years, with nationalization in Libya and Iraq (which furthered the decline of international oil companies’ previous commanding role) and increased concerns over supply prospects, confirmed the tensions and worries in political circles over the potential of supply shortages – including the use of oil resources as a political weapon.²

The 1973-74 embargo on the United States and the Netherlands during and after the Yom Kippur War was thus a limited surprise for observers at the time. The panic and price hikes that ensued, however, were nonetheless significant, and had durable consequences. As uncertainty about supply built, increased political pressure forced state actors to take measures, and led to more deliberate, concentrated actions by governments to protect their national interest through reliable, stable, and affordable supplies of energy. Those actions were conducted in the midst of a rethinking of how the State would deal with energy as a “public problem:” the United States created the Department of Energy; the United Kingdom also created a new Department of Energy; the Canadian government established the ill-fated National Energy Program; and the Western States created the International Energy Agency³ and began organizing a strategic petroleum reserve system to cope with future disruptions. Finally, the invasion of Afghanistan by Soviet forces in 1979 prompted the establishment of what would become known as the Carter Doctrine, by which the United States pledged to defend their access to Persian Gulf oil with

² Francisco Parra, *Oil Politics: A Modern History of Petroleum* (London: I.B.Tauris & Co. Ltd., 2005); Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (New York: Free Press, 1993).

³ Original members were Austria, Belgium, Canada, Denmark, West Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

armed forces if needed.⁴ This cemented the West's political commitment to ensuring energy security by all means necessary.

Up to 1970, international energy markets consisted of a quasi-cartel dominated by seven oil majors, where slowly increasing competition took place, and which operated in the context of stringent concession agreements.⁵ Furthermore, if the period after 1970 witnessed seemingly confused and poorly focused debates over energy security,⁶ the decade ended with a marked sense that short-term action was needed to improve energy security, but also that longer-term solutions would have to be provided in order to reduce the insecurity linked to energy. The ensuing adjustment, accomplished mostly through increased efficiency, modified drastically the way consuming countries used energy.⁷ In addition, the establishment of the Carter Doctrine and the extensions that followed (see below) went a long way in asserting a firm response to short-term political challenges. Nevertheless, the sharp price descent that followed in the mid-1980s reduced the political and economic incentives to implement the longer-term responses.

The events since the fall of the Berlin Wall highlight other recent changes in the dynamics of energy international relations. The increased presence of Russia and other former Soviet republics as major producers is a salient one, but the political alliances with regard to energy are also different from the 1970s. Behind the reorganization of the state's role in energy and the creation of consumer defence mechanisms after the first oil shocks, there was a concern over maintaining the anti-Communist political alliances. Since the beginning of the 1990s and the demise of the Soviet-led Communist bloc, however, these alliances have been facing changed circumstances. The arrival of some rapidly-growing developing countries, most specifically China and India, has produced debates over the need to reshape these alliances into a fully consumer-based bloc, in order to temper the negative effects of resource competition, as well as effectively manage the relations with major producers.

In general terms, oil markets have undergone a structural change by becoming more global and integrated. This is in sync with the overall economic context involving free trade, deregulation, technological progress, and increased productivity. All these factors have contributed to greater energy efficiency. The importance of oil has diminished for Organization for Economic Cooperation and Development (OECD) countries, both as a share of the total energy mix and as a share of power generation.⁸ This has led some commentators to question the (implicit or explicit) use of oil markets as a proxy for all international energy considerations.

Finally, the energy industry, and consequently debates over energy security, is being transformed by the sustainable development paradigm and by the impact of policy intervention with regard to greenhouse gas emissions. Proponents of an economic view of energy security and others

⁴ See section 4 below for further discussion on the Carter Doctrine.

⁵ Parra, *Oil Politics*.

⁶ Howard Bucknell, *Energy and the National Defense* (Lexington: University Press of Kentucky, 1981) from Joseph S. Nye Jr., "Energy Security in the 1980s," *World Politics*, 35:1 (1982), pp. 121-134.

⁷ Peter Tertzakian, *A Thousand Barrels a Second: The Coming Oil Break Point and the Challenges Facing an Energy Dependent World* (New York: McGraw-Hill, 2006).

⁸ J. Bielecki, "Energy security: is the wolf at the door?" *The Quarterly Review of Economics and Finance*, 42 (2002), pp. 235-250.

concerned with environmental impacts of energy use, share several arguments that are having an impact on contemporary policy choices.

From this brief overview a few key differences between current and previous debates can be identified. First, there is a widespread opposition to analysts who argue that energy security can be “solved” by foreign policy and military action, even if these military and security considerations still dominate debates. Second, an important part of that opposition consists of market-based arguments, reinforced by the sustained domination of free trade and by the rapid financial developments in international energy markets. And, third, two decades of debates and negotiations on environmental and sustainability concerns linked to energy use have given strength to all-encompassing or holistic views on energy security, which illustrate illustrating the far-reaching impact related policy decisions have on societies. Section 4, below, details these arguments and debates.

3 Energy Security: Conceptual Issues

The debates surrounding energy security have become more complex, but also more disparate and scattered. The “totality” of energy, the fact that energy penetrates virtually all aspects of our lives, makes it extremely hard to focus the debates and policies on specific aspects, on one hand, and even more to center them on a comprehensive definition of what energy security actually entails. Ciută states the implications of this:

Lawyers, bankers, brokers, economists, geographers, geologists, engineers and journalists speak of energy security with the same confidence as generals, development workers, defence analysts or environmental activists. However, energy security has been an inauspicious terrain for security theory. Abundant analyses of pipeline politics stand in stark contrast to the very few attempts to make sense of energy security conceptually, unlike other issues that have been under constant scrutiny, such as the environment, HIV/AIDS or migration. Paradoxically, the proliferation of energy security discourses has, on the one hand, established the legitimate association of energy and security and, on the other, prevented a closer conceptual and normative attention to energy security.⁹

Ciută’s and others’ efforts are recent attempts at making sense of energy security conceptually: or, in other words, to answer the question in what sense is energy a security issue?

The first confusion is a fundamental question about the notion of security with regard to energy. To the extent that energy supplies present some form of uncertainty, it is agreed that energy can be a security problem. But what is the object of energy security? Put another way, what exactly is there to be secured? As Mulligan points out,¹⁰ despite the simplicity of the underlying principle, this is a challenging question to pin down. A first answer is energy itself, generally understood as the securing of energy sources (at least in the case of traditional fossil fuel reserves) and their associated supply chains. However, this securing of energy as a raw commodity supposes a certain set of goals, or some purpose, that is inherently linked to energy. In other words, “energy is largely *a means* to the security of another valued entity (the state, economic activity, livelihoods, identities). That is, securing energy supplies is a means to maintaining all that such energy makes possible.”¹¹

This problem is illustrated by the myriad definitions of energy security found in academic contributions, speeches, and policy documents alike—or indeed the absence of any definition at all.¹² At its narrowest, the general definition posits that energy security is about ensuring a reliable and affordable supply of energy, or “a reliable and adequate supply of energy at

⁹ Felix Ciută, “Conceptual Notes on Energy Security: Total or Banal Security?” *Security Dialogue*, 41:2 (2010), pp. 123-124.

¹⁰ Shane Mulligan, *The Changing Face of Energy Security*, Paper prepared for the 80th Annual Conference of the Canadian Political Science Association, Vancouver, Canada, 4-6 June (2008).

¹¹ *Ibid.*, p. 4.

¹² For a detailed discussion over these definitional matters, see Ciută, “Conceptual Notes on Energy Security.”

reasonable prices.”¹³ As discussed above, this definition is incomplete, as it lacks two components: to whom? And for what purpose? The former question is addressed by redefining it as “the availability of energy to those who are willing to pay the market price,”¹⁴ or (more frequently) by an implicit acceptance of states as the subject. On the objective question, two versions emerge. The first comes in a reactive form, asserting that the objective of energy security is “to assure adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardize major national values and objectives.”¹⁵ The main idea herein is that security is about mitigating disruptions of various kinds, again implying that energy is essential to economic growth, development, or whatever the national values and objectives of a particular state are. A second version is more proactive in form, seeing “the goal of energy security [as being] to assure adequate, reliable energy services in ways that increase economic competitiveness and decrease environmental degradation,”¹⁶ or as the “ability to access the energy resources required for the continued development of national power.”¹⁷

As the next section will show, those small but critical distinctions highlight the malleability of the concept itself, which in turn shapes the debates, policy actions, and consequences of those interventions. A bottom line definition could be vaguer on different components of the definition, for example by positing energy security as sufficient access to affordable and dependable energy sources to enable the successful pursuit of a set of national needs. This would be a generic definition where two terms, “sufficient” and “national needs,” are flexible enough to encompass any state that is pursuing energy security, and for any purpose. In other words, a generic definition would not solve the substantive definitional problems, but would at least inherently illustrate the implications of its application.

All this points to another characteristic of the various definitions: the overwhelming emphasis on the state as the primary actor concerned. There seems to be an implicit agreement on the national dimension of energy security, as a large majority of energy security debates are about countries and governments. Interestingly, this is not only true for approaches based on geopolitics, but also for market-based approaches and environmental arguments (see next section). There is a strong sense of the need for governments to act in order to ensure energy security; in other words, governments are believed to be the main actors both *concerned by* and *responsible for* energy security.

This strong emphasis on the national dimension of energy security does not preclude disagreements on the dynamics at play, however. The next confusion lies in what characterizes best these dynamics that are affecting energy security prospects. As will be discussed further in the next section, there is at least a clash between a set of analyses based on competition, and another based on interdependence. Competition-based approaches underscore the dominance of

¹³ Bielecki, “Energy security: is the wolf at the door?”

¹⁴ Noël, “Is Energy Security a Political, Military, or Market Problem?”

¹⁵ Daniel Yergin, “Energy Security in the 1990s,” *Foreign Affairs*, 67:1 (1988), p. 111 from Joseph J. Romm, *Defining National Security: The Non-Military Aspects* (New York: Council on Foreign Relations Press, 1993), p. 37.

¹⁶ Romm, *Defining National Security*, p. 50.

¹⁷ Jan H. Kalicki and David L. Goldwyn, “Introduction: The Need to Integrate Energy and Foreign Policy,” in Jan H. Kalicki and David L. Goldwyn (eds.), *Energy & Security: Toward a New Foreign Policy Strategy* (Washington, D.C.: Woodrow Wilson Center, 2005), p. 9.

finite resources in energy use, and analyze the geopolitical implications of states wanting access;¹⁸ the second set of approaches emphasize the high degree of interdependence in international energy markets, and warns about the oversimplification of energy security when seen through a geostrategic lens.¹⁹

Another set of considerations underscores the distinctions between several groups of actors. Following from above, energy security is about impediments or ambitions related to the pursuit of national needs, and these are hardly the same for different governments. The two main groups identified are producers and consumers, which have different understandings of what energy security means for them. Energy-exporting countries focus on security of demand, and attempt to maximize market share while simultaneously meeting world expectations pertaining to their reliability as fair suppliers. The importing countries are in a wholly different situation, where they struggle to diversify supplies to maximize their access and their security, and complement this with mechanisms to cope with disruptions. A third set of actors regroups ‘transit’ states, defined as “essential bridges connecting exporters with their markets”, and who are playing a growing role in the discussion.²⁰

Furthermore, additional distinctions need to be made among the consumer group: developing countries like China and India worry about the balance of payments impacts of increased reliability on world markets and of changing energy prices; resource-poor countries like Japan strive to compensate through diversification and trade; in Europe, the discussions focus on dependency on natural gas; and the United States juggles with the fact that it desperately needs alternatives to the questionable goal of ‘energy independence.’²¹ These distinctions also raise questions about the appropriateness of current international institutions (especially the IEA) as useful coalitions of energy-consuming countries.

This categorization by type of (state) actor overlaps with another aspect, which considers the differences between the various sectors of the energy industry, primarily transportation and electricity. While there is considerable diversity in sources to provide the latter, the former depends virtually solely on oil. Countries like Saudi Arabia and Russia can rely on their own reserves for both, while others like the United States (coal) and France (nuclear) are close to self-sufficiency in their electricity sector but heavily dependent on foreign oil for transport. Brazil is an example of an opposite situation, where the transport sector is self-sufficient because of sugarcane ethanol production, but where generating electricity depends on imported natural gas.²² Finally, there are disagreements over which segments of the energy system should be included in

¹⁸ Michael T. Klare, *Rising Powers, Shrinking Planet: The New Geopolitics of Energy* (Tomball: Metropolitan Publishing 2008).

¹⁹ For example Daniel Yergin, “Ensuring Energy Security,” *Foreign Affairs*, 85:2 (2006), pp. 69-75; Frank Verrastro and Sarah Ladislaw, “Providing Energy Security in an Interdependent World,” *The Washington Quarterly*, 30:4 (2007), pp. 95-104.

²⁰ Gal Luft and Anne Korin, “Energy Security: In the Eyes of the Beholder,” in Gal Luft and Anne Korin (eds.), *Energy Security Challenges for the 21st Century* (Santa Barbara: ABC-CLIO, LLC, 2009), p. 12.

²¹ Yergin, “Ensuring Energy Security.”

²² Luft and Korin, “Energy Security.”

policy discussions over energy security: oil, gas, or nuclear power; reserves or infrastructure; production or distribution.²³

This divergence in the debates makes it hard to establish a bottom line. There is general agreement over the fact that energy security means different things for different actors (those actors being states in most discussions). Energy security is thus an umbrella term, mixing energy concerns with economic growth, environmental issues, and political power. This produces a “politics” of energy security, and consequently a choice over how to approach the problem, based on different needs, different interests, different beliefs of what the problem is, and consequently different policy solutions. The next section details the dominant contemporary approaches, and discusses the impacts of policy choices made.

²³ Ciută, “Conceptual Notes on Energy Security.”

4 Policy Intervention: The Multiple Dimensions of the Energy Security Problem

As the previous section has discussed, the malleability of the energy security concept illustrates that politics determines its boundaries, not least because of the myriad actors that participate in the policy discussions on ways to address it as a public problem. There is a multiplication of actors with different interests, and the power of those actors determines certain policy outcomes. With the objective of demonstrating these differences and their impact, this section summarizes the main policy approaches to energy security. The first two parts consist of an overview of the geostrategic and economic approaches, which correspond more or less to the “regions and empires” and the “markets and institutions” narratives found in the literature.²⁴ The third part discusses the environmental dimension, which is arguably one of the main additions in contemporary debates related to energy security. The purpose is to detail what these approaches produce in terms of policy, with a penultimate subsection describing the problems with each of them, and the tensions between them. The section ends with a discussion on sophisticated policy approaches to energy security.

4.1 Energy Security as a Foreign Policy and Military Problem

The first approach discussed here sees energy security as a foreign policy and (by extension) military problem. This geopolitical approach focuses on the questions: how does energy affect international relations? And how does energy affect national security?

The tentative answers to these questions are usually based on two assumptions. First, oil, and to a lesser extent gas, dominate energy markets: oil trade can thus serve as a proxy for all sorts of energy matters. Second, because of its critical role in the economy, energy use is influenced by factors outside of the energy industry realm, principally with a link to national security.

With these assumptions in mind, there are several ways in which energy theoretically influences foreign policy objectives. According to Litvin, three types of risks are linked to a high level of imports (of oil and/or gas). First, there can be supply disruptions causing physical shortages that could damage importing countries’ economies; second, prices can jump high enough as to have a damaging effect on economies; and third, dependence on imports might “sour or negatively distort political relations between countries or regions.”²⁵ In a report addressing similar questions, the Council on Foreign Relations was more specific (with a focus on the U.S. situation), detailing six links: first, the fact that enormous oil revenues give exporting countries the flexibility to pursue policies that go against U.S. interests and values; second, the ability of the United States to form partnerships is constrained by the political realignments caused by oil dependence; third,

²⁴ CIEP, *Study on Energy Supply Security and Geopolitics* (2004), final report prepared for DG TREN, The Hague: The Clingendael International Energy Programme. See also Aad Correljé and Coby van der Linde, “Energy supply security and geopolitics: A European perspective,” *Energy Policy*, 34 (2006), pp. 532-543; Richard Youngs, *Energy Security: Europe’s new foreign policy challenge* (London: Routledge, 2009).

²⁵ Daniel Litvin, *Oil, Gas and International Security: Tackling a Self-fuelling Fire* (London: Chatham House, 2009), p. 3.

price hikes and scarcity of supplies create fears about the impossibility of the current open market system to ensure a secure supply; fourth, local governance can be undermined by oil and gas exports revenues; fifth, adverse political and economic impacts would be felt in the United States should a significant interruption in oil supply occur; and sixth, a sizeable portion of the United States defence budget goes to military presence and monitoring in the Persian Gulf region, and consequently significant reductions in this military posture could be achieved in the absence of a dependency on oil.²⁶

The energy security problem, in this view, is thus a purely geostrategic issue, based on a logic of war: energy is both the object of war (what states compete for) and the instrument of war (what states compete with).²⁷ The language used in these debates is particularly telling, with the prominent use of terms such as the “oil weapon,” “competition over access,” and “exclusive backyards,” amongst others. Under this logic, energy security is derivative of geopolitics, as the “struggle for energy is (...) subsumed under the ‘normal’ competition for power, survival, land, valuable materials or markets.”²⁸ Consequently, what comes out of these lines of argument is the inherent national dimension to all the discussions. The international oil companies, where mentioned, are often reduced to their home countries.

The pillars of this approach to energy security are exemplified in the “regions and empires” narrative. In this storyline, the key change to energy security brought by the crises of the 1970s was an increasingly important geopolitical dimension. This approach would thus “place greater stress on strategic alliances; the search for ‘exclusive backyards’; military power to protect supplies; intra-Western rivalry and undercutting and Western oil companies taking control of production capacity through buy outs and mergers in producer states.”²⁹ The common theme of analysis within this view is the idea that Western consumer countries should be wary of neglecting systematically to “incorporate energy security concerns into the design of their foreign policies.”³⁰

The “regions and empires” narrative also places great importance on unilateral security policy in international energy market dynamics, involving essentially,

a division of the world into countries and regions, on the basis of ideology, religion, and political arguments. Political and military strategy, bilateralism and regionalism divide the world up into competing U.S., E.U., Russian and Asian spheres of influence. The absence of effective world markets for strategic goods further stimulates the establishment of bilateral trade relationships and treaties, thus reinforcing the formation of more or less integrated blocks with satellite regions that compete for markets and energy resources.³¹

²⁶ CFR, *National Security Consequences of U.S. Oil Dependency* (New York: Council on Foreign Relations, Independent Task Force Report No. 58, 2006).

²⁷ Ciută, “Conceptual Notes on Energy Security.”

²⁸ Flynt Leverett and Pierre Noël, “Ahead of the Curve: The New Axis of Oil,” *National Interest Online*, 13 February 2007 from Ciută, “Conceptual Notes on Energy Security,” p. 130.

²⁹ Youngs, *Energy Security*, p.8.

³⁰ *Ibid.*, p.8.

³¹ Correljé and van der Linde, “Energy supply security and geopolitics,” p. 536.

With, again, an implicit focus on oil and gas, proponents of this narrative would argue, for instance, that just four states (Russia, Iran, Turkmenistan and Qatar) possess more than half global gas reserves. Consequently, “many [doubt] the extent to which gas would be subjected to market dynamics, with fixed, structural dependence on a small number of producers actually increasing (...) and [lament] that the much heralded take-off of [liquefied natural gas] was proving illusive.”³²

These arguments produce a conceptual framework for energy security by highlighting more or less three interrelated levels of the (foreign policy) problem: vulnerabilities of the oil and gas supply chain; changes in the oil and gas trade patterns; and changes in geopolitical environments for the supply of oil and gas.³³ This is already quite restrictive, but the reasoning can be pushed further through its logical extension: energy becoming an integral part of strategic planning. The situation in Africa and Central Asia leaves little doubt as to the existence of at least some sense of competition over access to resources between core energy players (mostly China, the U.S., and Russia). The arrival of military planning to such problems, however, inspires “a logic of hardening, securing and protecting” in the entire domain of energy.³⁴

The military component of energy security is not new, stemming back to at least the establishment of the Carter Doctrine.³⁵ Following the Islamic revolution in Iran and the invasion of Afghanistan by the Soviet Union, U.S. President Jimmy Carter delivered a strong message to the world in his 1980 State of the Union address:

Let our position be absolutely clear: an attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and such an assault will be repelled by any means necessary, including military force.³⁶

As Michael Klare points out, however, what is most striking with hindsight is not the assertion of the Carter Doctrine itself, but its reassertion and extension by every U.S. President since: after Carter created the Rapid Deployment Joint Task Force (RDJTF), subsequent Presidents followed with clear actions in support of the Doctrine. At first, it consisted of more “traditional” military actions: Ronald Reagan elevated the RDJTF to a full-scale regional headquarters, and eventually asserted the United States’ determination to protect oil flows in the Gulf by authorizing the “reflagging” of Kuwaiti tankers with the American ensign (and their protection); George H.W. Bush then protected Saudi Arabia against possible Iraqi attack (Operation Desert Shield) and then drove the Iraqis out of Kuwait (Operation Desert Storm) in the Persian Gulf War. These actions

³² Youngs, *Energy Security*, p. 9.

³³ Uwe Nerlich, “Energy Security or a New Globalization of Conflicts? Oil and Gas in Evolving New Power Structures,” *Strategic Insights*, VII:1 (2008).

³⁴ David G. Victor, “Smoke and Mirrors,” *National Interest online*, 2 January 2008 from Ciută, “Conceptual Notes on Energy Security,” p. 131.

³⁵ Earlier examples are also easy to find, for instance military preparation by the United States following the OPEC oil embargo in 1973. See for example Christopher J. Fettweis, “No Blood for Oil: Why Resource Wars Are Obsolete,” in Gal Luft and Anne Korin (eds.), *Energy Security Challenges for the 21st Century* (Santa Barbara, USA: Praeger Security International (ABC-CLIO, LLC), 2009), pp. 66-77.

³⁶ Jimmy Carter, *State of the Union Address 1980* (23 January). Online, <<http://www.jimmycarterlibrary.org/documents/speeches/su80jec.phtml>> (accessed on 13 March 2010).

were soon extended, furthermore, to most other oil-producing regions of the world. The Clinton administration, for instance, pushed for the construction of a new oil pipeline between Azerbaijan through Georgia to Turkey, and began assisting these states with military aid and through a series of annual joint military exercises.³⁷ Finally, after Clinton started this ‘globalization’ of the Carter Doctrine, George W. Bush made it a central objective of American foreign policy, as a consequence of the National Energy Policy announced in 2001.³⁸

Klare and others go on to argue that this militarization, stemming from a simplified and overly strategic view of energy security concerns, increase the prospects for conflict and war in years to come. Several mechanisms influence those prospects: the prominence of insurgency and separatist warfare in oil-producing regions; the political violence associated with mechanisms falling under the ‘resource curse’ purview; international terrorism by groups such as Al-Qaeda; increased tensions over contested maritime resource zones as onshore energy sources are depleted; and, more generally, increasing doubts about the future sufficiency of global stockpiles of oil and gas.³⁹ This, on top of the globalization of the Carter Doctrine, leads to a higher potential for conflict. To illustrate this, the most discussed case in the contemporary period is, “a growing risk, therefore, that U.S. and Chinese efforts to militarize their foreign energy endeavours will produce a competitive stance between them and someday spark a dangerous confrontation.”⁴⁰

As can be expected, not every analyst shares this pessimism over future prospects for international energy dynamics. Fettweis, in a direct rebuttal of Klare’s arguments on the matter, argues that at least three reasons make it unlikely that wars over territories containing resources will be more common in the 21st century: first, fighting to control oil is usually a self-defeating proposition, as seizing oil will always be costlier than buying it; second, both consumers and producers share the same interest in stability; finally, there are fewer instances of any kind of warfare.⁴¹ In a different assessment, Daniel Yergin emphasizes the implications of interdependence in international energy markets, and both authors conclude that China and the United States are most likely to end up on the same side if a clash between producing and importing countries should happen again.⁴²

Flowing from these debates, the foreign policy and military approach to energy security also underscores the United States’ special position and role in these matters. These considerations are neither based solely on the U.S. being a powerful actor on the international scene, nor on their use of the military in energy-related policy: other states have considerable influence, and the use of the military to protect the secure flow of oil is common all around the world. What makes the United States a special case is the extent to which their actions influence the global energy

³⁷ Michael T. Klare, “Protecting Overseas Oil Supplies: The Globalization of the ‘Carter Doctrine,’” in John Byrne, Noah Toly, and Leigh Glover (eds.), *Transforming Power: Energy, Environment, and Society in Conflict* (New Brunswick, USA: Transaction Publishers, 2006).

³⁸ Ibid.

³⁹ Michael T. Klare, “There Will Be Blood: Political Violence, Regional Warfare, and Risk of Great-Power Conflict over Contested Energy Sources,” in Gal Luft and Anne Korin (eds.), *Energy Security Challenges for the 21st Century* (Santa Barbara, USA: Praeger Security International (ABC-CLIO, LLC), 2009), pp.44-65.

⁴⁰ Ibid., p. 59.

⁴¹ Fettweis, “No Blood for Oil.”

⁴² Yergin, “Ensuring Energy Security.”

situation, giving it a set of responsibilities unequalled by any other state.⁴³ The United States' leading Cold War role during the 1970s and 1980s, and later on the "globalization" of the Carter Doctrine taken broadly, show that their "system-maintaining role has benefited a number of core states as well as America itself, [by] maintaining a stable supply of crucial energy onto the world market."⁴⁴

Finally, some proponents of this approach also see the inherently unstable nature of oil and gas exploitation as reinforcing these dynamics: exploitation of oil and gas, as it has been done in the past few decades, show patterns of increases in national instability, of public and political distrust, and of emergence of destabilizing forms of competition.⁴⁵ Several different policies are being developed to deal with those issues, but an important policy gap remains in the sense that little attention is paid to changing those underlying dynamics.⁴⁶

The bottom line is that while this approach has strong appeal, its limited focus on oil and gas, and on competition between states, oversimplifies issues related to securing energy supplies. Mitigation strategies are often reduced to diversification,⁴⁷ and the militarizing of the problem tends to order issues in a hierarchical manner,⁴⁸ relegating other important concerns.

4.2 Energy Security as an Economic and Technological Problem

The second approach is drastically different from the first in its assumptions about the underlying dynamics of international energy markets, though not in the level of analysis and actors involved. Proponents of this second approach do not fundamentally deny the relationships advanced by the geopolitics view, but contend that in discussions over the problem of energy security, the emphasis should be put on the characteristics of international energy markets.

To some authors, interdependence, not competition, best defines energy markets since the 1970s. As briefly detailed above, the oil shocks, despite their disruptive effect, brought a much needed reorganization of international energy markets, where prices were not fixed but determined by supply and demand. This allowed for a better (and cheaper) allocation of energy between the different consumers—despite the drawbacks of the political use of reserves and the price hikes that ensued.

These arguments are sometimes regrouped in the "markets and institutions" narrative, opposed to the "regions and empires" one discussed above. In this narrative, the key change since the oil shocks of the 1970s has been the growing role of international markets. Proponents of this view argue that the economics of energy, transformed by the expansion of commodity and financial

⁴³ CFR, *National Security Consequences of U.S. Oil Dependency*.

⁴⁴ Doug Stokes, "Blood for oil? Global capital, counter-insurgency and the dual logic of American energy security," *Review of International Studies*, 33 (2007), p. 250.

⁴⁵ Litvin, *Oil, Gas and International Security*.

⁴⁶ Ibid.

⁴⁷ See for example Vlado Vivoda, "Diversification of Oil Import Sources and Energy Security: A Key Strategy or an Elusive Objective?" *Energy Policy*, 37 (2009), pp. 4615-4623.

⁴⁸ For further discussion on this, see Ciută, "Conceptual Notes on Energy Security."

markets, rendered obsolete the geopolitics that dominated energy security thinking in the 1970s and 1980s. Oil was now more susceptible to market dynamics. Bilateral deals to guarantee supply were now rare and these evolutions were reinforced by the rapid development of international gas markets.⁴⁹

One of the main differences in policy recommendations is that the reduction of import dependence is argued as unnecessary. Energy policies should instead focus on extending markets and correcting imperfections, with free trade and information improvements being seen as the best path to energy security. The increasing internationalization of energy markets, with the participation of various international organizations, are the best indicators of what the future holds for energy security concerns, despite the tightening of markets.⁵⁰

The economic-technological view of the energy security problem argues that several counterbalancing forces largely compensate for the potential politically-based security problems: first, the impact of major supply disruptions has been limited by the existence of a liquid global market in oil, providing importers with alternative suppliers for crude oil needs; and second, higher prices on the short(er) term spur technological innovation and encourage the tapping of unconventional reserves, with the longer-term effect of stabilizing prices to a lower level.⁵¹

The logical extension of this approach is that energy security is, at its core, a pricing problem, if a sizeable one. Even if international energy markets are seen as penetrating and globalized, the end-user price of energy remains highly politicized: this accounts for major differences between countries and regions, and differing public opinion on energy matters. Apart from the usual public costs of subsidies and other political-economic support to the energy industry in most developed countries—to say nothing of state participation in exporting nations—other analysts point at the steep price for the (mostly American) military involvement in assuring a steady flow of oil out of unstable regions.⁵² All these costs are usually the State's burden, and are seen in the economic and technological view as biasing the markets by hiding the true price of energy. Thereby, they hinder the development of alternative energy sources, because both lower prices for oil and gas and damaging competition for public funds could go to research and development to make these alternatives cheaper more rapidly.

Technological solutions are also hampered by technical path dependency. Energy use being the backbone of any country's socio-technical system, the technical path dependency that is produced by an over-dependence on particular types or sources of energy can have an impact on the overall energy use, and on the success of policies designed to alter this state of affairs. This path dependency is defined as “the way historical choices have created entrenched pathways and difficult-to-displace standards that severely limit the options available to us today.”⁵³ This is especially visible in the transport sector, where the need for broad changes in infrastructure acts

⁴⁹ Youngs, *Energy Security*.

⁵⁰ Correljé and van der Linde, “Energy Supply Security and Geopolitics.”

⁵¹ Litvin, *Oil, Gas and International Security*.

⁵² Klare, for instance, evaluates it as at least \$100 billion annually. See Michael T. Klare, “The Futile Pursuit of ‘Energy Security’ by Military Force,” *Brown Journal of World Affairs*, XIII:2 (2007), pp. 139-153; see also Darwin C. Hall, “Oil and National Security,” *Energy Policy* (1992), pp. 1089-1096.

⁵³ Tertzakian, *A Thousand Barrels a Second*, p. xiv.

as a serious disincentive to alternatives to fuels designed for internal combustion engines.⁵⁴ But even more generally, energy options compatible with existing pipelines, vehicles, power generation facilities, and other infrastructure have a natural advantage when compared with sources that would require substantial modifications in infrastructure.⁵⁵ Consequently, with limited resources to spare, there is competition between spending on infrastructure protection, on efficiency improvements, and on the development of alternatives to these infrastructures. Hence the recommended policies differ greatly from the ones designed to deal with the geopolitical dimension.

Finally, proponents of this view argue that a focus on interdependence instead of competition produces a more cooperative search for solutions. The recognition that energy markets are integrated underscores the importance of engaging rising energy consumers—most especially China and India—to deepen this integration, and of improving the management of the complexity of this interdependence.⁵⁶ Thus, under this approach it makes less sense to talk about the energy security of a particular country because, despite the importance of states as the main players, energy security can only be achieved in a global context.

4.3 Energy Security as an Environmental Problem

This third subsection does not present a comprehensive alternative to the ‘regions and empires’ or ‘markets and institutions’ narratives. Rather, the purpose is to highlight the environmental aspects of energy security discussions in recent years. Environmental considerations are arguably the most far-reaching addition to debates over the complexity of energy and its security component in academic and policy circles. Here, proponents attempt to demonstrate that not only is energy security—and energy use generally—more complex than zero-sum geopolitical competition, as the economic approach already suggested, but that the “totality” of energy in our lives also make it critical to reassess completely the impact of energy use on the world we live in. Only by embracing this complexity can debates lead to real security in energy matters.⁵⁷

Several of these arguments take root in the sustainable development and climate change debates. With regard to the former, energy security is seen as incorporating notions of sustainability, adding a time dimension to the debates. Energy security is not just about securing access (in affordable and dependable ways), it is also about finding a solution to the access problem that will not affect future generations’ prospects of dealing with similar issues. Advocates of this view argue that the focus of energy security debates should thus be broader, and see energy use as part of a socio-technical system: major changes in energy are rooted in such systems and often wider societal change in values, beliefs, and governance.⁵⁸ Energy security debates are consequently

⁵⁴ Paul Roberts, *The End of Oil: On the Edge of a Perilous New World* (New York: Houghton Mifflin Company, 2004); see also Thomas L. Friedman, *Hot, Flat, and Crowded* (New York: Farrar, Straus and Giroux, 2008).

⁵⁵ Sarah Ladislaw, Kathryn Zyla, and Britt Childs, *Managing the Transition to a Secure, Low-Carbon Energy Future*, World Resource Institute, 2008, p. 5.

⁵⁶ Verrastro and Ladislaw, “Providing Energy Security in an Interdependent World.”

⁵⁷ *Ibid.*; James Meadowcroft, “Governing the transition to a new energy economy,” in Fraser Armstrong and Katherine Blundell (eds.), *Energy... Beyond Oil* (Oxford: Oxford University Press, 2007), pp. 197-214.

⁵⁸ René Kemp, Derk Loorbach and Jan Rotmans, “Transition Management as a Model for Managing Processes of Co-Evolution Towards Sustainable Development,” in Maj Munch Andersen and Arnold

directly linked to the question of how a new energy economy will emerge in the near future, and proponents put the emphasis on the means to influence the form it will take,⁵⁹ including most prominently the diffusion of power in modern societies, which may in and of itself constitute a problem for sustainable development.⁶⁰

The second area of debate is centered on climate change considerations. With the now widely-accepted notion of human activity playing a role in climate change and warming, discussions over policy remedies are focused on energy use as the principal culprit, given the intense greenhouse gas emissions produced by the burning of fossil fuels—among which chiefly are oil and coal. Any energy policy, and thus energy security, debate should take into account these externalities, and question the security impact of having a production system based on the burning of these fuels. These concerns are embedded in broader considerations over the environmental impact of energy use: the general idea is that if one is to talk about the security aspect of energy use, then this security notion needs to be broadened beyond energy supply, and should incorporate the security aspects of the *impacts* of using particular types of energy in certain contexts.⁶¹

Here energy policy, which refers to actions “aimed at influencing and shaping the supply of energy sources and fuels, the demand for these by various users of energy, and the environmental impacts of energy use,”⁶² is seen as the main tool to deal with energy security, as long—and it is a critical qualification—as it is not subsumed to other matters related to energy. Given the complexity and the far-reaching implications of energy security, a comprehensive and coherent policy reaction to these issues is warranted, to counteract the contradicting impact of various other policies (foreign, economic, etc.).

Hence these two related views agree with the proponents of the economic and technological approach on their assessment of the imperfect economics of energy markets, but push the argument further than just a correction of those imperfections. Apart from the expected emphasis on environmental externalities, it is the necessity of evaluating such externalities in a long-term perspective that should be at the center of energy discussions. Or put another way, energy security discussions are inseparable from sustainable development considerations. Related to these arguments, others support “ecological modernization,” based on the idea that pollution prevention actually pays: the shift from a reactive approach similar to the 1970s’ regulatory apparatus, and based on “cleaning up” after pollution, to a proactive, anticipatory apparatus that incorporates environmental costs in order to prevent or at least anticipate prospective pollution and environmental impacts.⁶³

Tukker (eds.), *Perspectives on Radical Changes to Sustainable Consumption and Production*, Workshop of the Sustainable Consumption Research Exchange Network (Copenhagen, 20-21 April, 2006), pp. 459-478.

⁵⁹ Meadowcroft, “Governing the transition to a new energy economy.”

⁶⁰ James Meadowcroft, “Who is in Charge here? Governance for Sustainable Development in a Complex World,” *Journal of Environmental Policy & Planning*, 9:3-4 (2007), pp. 299-314.

⁶¹ See for example Friedman, *Hot, Flat, and Crowded*.

⁶² G. Bruce Doern, “Canadian Energy Policy and the Struggle for Sustainable Development: Political-Economic Context,” in G. Bruce Doern (ed.), *Canadian Energy Policy and the Struggle for Sustainable Development* (Toronto: University of Toronto Press Incorporated, 2005), p. 5.

⁶³ David Schlosberg and Sara Rinfret, “Ecological modernisation, American Style,” *Environmental Politics*, 17:2 (2008), pp. 254-275.

Moreover, an alternative socio-technical system based on renewables could change the energy game completely, and has the potential of rendering less relevant the dominance of geopolitics. If energy production becomes technology-focused towards renewables—solar, wave, wind etc.—in contrast to a focus on access to finite reserves of a particular resource, then the distributive logic of international competition over access would be affected. This is in sharp contrast with the geostrategic approach, and to a lesser extent the economic approach, as it questions the fundamental underlying assumption that oil and gas are the appropriate proxy to discuss energy matters. Environmental considerations, in their broadest sense, provide an explanation as to why the use of this proxy in energy security debates is misleading, as it takes the socio-technical system as given, precluding by nature discussions on alternatives which might reduce, or possibly break, the constraints on current energy policy.

The arguments based on environmental concerns thus enrich the debates over how to design policies to ensure energy security. At the same time the environment-led approaches do not convincingly eliminate pertinent shorter-term points brought out by the more traditional analyses of the first two approaches—as oil and gas are likely to dominate international markets in the short to medium-term. In its narrowest sense, environmental considerations are a complement to (or even a mere part of) the pricing argument put forward by proponents of the economic view, but even when considered as such, proponents are able to highlight the tension between the overwhelmingly national views of energy security and the inherently global scope of security concerns linked with the environment.

4.4 Inherent Contradictions in Intervention

Having outlined the characteristics and assumptions underlying the main approaches to energy security, this section now contrasts them to highlight the contradictions and policy issues they raise. In the ensuing analysis, disagreements over what the goal of energy policy should be, or put another way what energy security actually entails, as suggested in section 3 above, stand out.

The emphasis on the potential for conflict found in some arguments related to the geopolitics approach attracts the first critique of that view. It is not clear how such conflicts would be in line with the interests of states: if confrontation occurs, it could conceivably lead to greater energy scarcity, and thus less energy security in terms of surety of supply.⁶⁴ More generally, this emphasis on an aggressive foreign policy as the main path to improve and ensure energy security brings out other tensions between short-term and long-term considerations. Short-term diplomatic interventions and military alliances may be strategically necessary from the importing countries' position, but these actions sometimes lead to destabilizing long-term dynamics:

these measures may be helping to perpetuate non-democratic regimes that ultimately prove unstable; encouraging corruption and weak governance in producing countries (as local elites are wooed by different importers); creating local distrust of importing countries' energy firms (as these come to be perceived as symbols of foreign influence and interference); and raising the risk that

⁶⁴ Ciută, "Conceptual Notes on Energy Security."

competition for influence between importers turns into a dangerous ‘scramble’ for resources.⁶⁵

Furthermore, several of the prescriptions coming out of this approach are fundamentally based on the potential use of the “oil weapon.” The potential of the ‘oil weapon’ might be overstated however, as some question the past success of oil (and gas) embargoes as foreign policy instruments.⁶⁶ Similar qualifications can be made to the theoretical goal of energy independence, usually put forward to promote local production over imports: in a world where reserves of oil and gas are finite, calls for such a goal, unless they imply a major shift to renewables, actually moves a country away from energy security on the longer-term, by depleting resources on its soil rather than consuming energy coming from outside its borders first.

Some of these critiques come from proponents of the economic-technological approaches, but similar qualifications can be made with regard to prescriptions from those advocates. Embracing—and praising—the role of international markets as the solution of many problems pointed out by geopolitical assessments of energy security often downplays the extent to which these markets are not free, “rational,” or perfect. It is unclear how the overwhelming presence of state players on the production side does not impact the overall trade in energy,⁶⁷ especially if one also considers the more indirect role of state players on the consumption side. Even then, given the sizeable participation of consuming countries’ governments in influencing the price that their population and industries pay for energy, the perspective of energy trade being a liberalized market seems even more distant, as the situation in oil and gas seems to suggest. Finally, the relationship between costs for U.S. forces to secure the supply and transit of oil from the Persian Gulf (and elsewhere) is more complex than usually implied, as military forces are to a great extent multipurpose and fungible.⁶⁸

The tradeoffs between the different solutions to the energy security problem, with the general objective of increasing supply, are thus easy to find. Liquefied natural gas (LNG), for instance, presents some advantages⁶⁹ and is hailed by some as the “next prize,” but simultaneously produces relations that are not necessarily conducive to energy security;⁷⁰ the same is true when trying to reconcile security and the environment:

policies [to reduce greenhouse gas emissions] may be good for the environment, but they constrain growth in the fossil energy sector which, for now, is, in most

⁶⁵ Litvin, *Oil, Gas and International Security*, p.12.

⁶⁶ RAND, *Imported Oil and U.S. National Security* (Santa Monica: RAND Corporation: Infrastructure, Safety, and Environment and National Security Research Division, 2009).

⁶⁷ For a detailed analysis see for example CFR, *National Security Consequences of U.S. Oil Dependency*; Peter Johnston, “The Energy Security Impact of Oil Nationalization: Alternate Futures Scenarios for the Global Futures Forum” DRDC CORA TM 2009-047 (Ottawa: Defence R&D Canada, Centre for Operational Research and Analysis, October 2009).

⁶⁸ RAND, *Imported Oil and U.S. National Security*. See chapter 5 in the report for a review of different estimates in the literature.

⁶⁹ See for example Donald A. Juckett and Michelle Michot Foss, “Can a ‘Global’ Natural Gas Market Be Achieved?” in Jan H. Kalicki and David L. Goldwyn (eds.), *Energy & Security: Toward a New Foreign Policy Strategy* (Washington, D.C.: Woodrow Wilson Center, 2005), pp. 531-552.

⁷⁰ Luft and Korin, “Energy Security,” p. 4. See also Deron Lovaas, “Balancing Energy Security and the Environment,” in the same volume.

cases, more economical than renewable energy. In developed countries such as the United States, where such policies have not yet been adopted, uncertainty about the regulatory future forces energy companies to hold back on their investment until it becomes clear what, if any, additional governmental constraints will be placed on the market.⁷¹

In addition, countries that would move from coal to natural gas in order to reduce their environmental footprint, for instance, could by the same token become dependent on foreign countries for their energy supply, thereby having a negative impact on their energy security.⁷² If those arguments have the benefit of highlighting the global nature of environmental impacts of energy use, they obviously do not eliminate the significance of geostrategic tensions and their links with energy.

In effect, while there are some overlapping policy solutions, it needs to be kept in mind that choices favouring certain outcomes hold the potential of worsening other aspects. These tradeoffs underscore the importance of goal definition, and by extension policy choices that are made. Hence the different approaches bring us back to the questions asked in the previous section: what does security mean with regard to energy? The security of energy itself (of access/supply); the security of economic activity (of usage); or security in a broader sense, including all the impacts of its use—or put another way, security *from* its usage?

4.5 Sophisticated Policy Approaches to Energy

This sub-section is not intended as an exhaustive listing of policy recommendations that have been made to overcome or mitigate the shortcomings of the approaches presented above. The objective is to get a sense of what is being proposed in the literature, by providing examples of comprehensive sets of policy prescriptions.

One such approach is centered on the shortcomings of the pricing mechanisms at the heart of the energy security problem, pushing further the economic view argued above. Griffin argues that the discussion should focus on reconciling the three conflicting goals of energy policy: the priority should be to make energy cheap, clean, and secure.⁷³ These goals are conflicting because even if markets generally do a good job at providing cheap energy, these sources are not necessarily clean and secure. The problem of energy is thus to make critical policy choices to fix these pricing disparities, in order to spur the technological advances that are needed to produce a drastic shift from the current situation. These choices, according to Griffin, go through some form of oil security taxes and of carbon taxes, in addition to tougher fuel-economy standards and increased spending on alternative technologies.⁷⁴ Only then can society balance those three essential but conflicting goals.

⁷¹ Luft and Korin, “Energy Security,” p. 4.

⁷² Luft and Korin, “Energy Security.” See also Lovaas, “Balancing Energy Security and the Environment.”

⁷³ James M. Griffin, *A Smart Energy Policy: An Economist’s Rx for Balancing Cheap, Clean, and Secure Energy* (New Haven: Yale University Press, 2009).

⁷⁴ *Ibid.* See also Pierre Noël, “Challenging the Myths of Energy Security,” *Financial Times*, 11 January 2008.

Another approach presses forward the potential of decentralized energy, known interchangeably by terms such as “distributed generation, on-site power, embedded generation, captive power, backup generation, uninterruptible power, cogeneration, and district energy.”⁷⁵ Despite some differences between what is identified by those terms, the common idea is a simple one: to generate electricity where it is needed. The list of what the decentralized energy paradigm has to offer is extensive: “substantial economic savings via reduced capital requirements, increased fuel efficiency, reduced green house gas emissions, reduced emissions of health-debilitating air services such as voltage support and operating reserves, and [decentralized energy] is often the most affordable option for bringing power to communities without a modern grid.”⁷⁶ Of paramount relevance to this discussion is that decentralized energy can increase the energy security outlook of the regions in which it is employed in terms of reduced infrastructure vulnerability, reduced dependence on imported fuels, and a relieved potential for supply shortages by the creation of a more robust grid. Finally, the size of decentralized energy constructions can be drastically different from traditional centralized power plants, as a small plant can be up and running in months of even days.⁷⁷

Another set of arguments is based on the reorganizing of government institutions to deal adequately with energy security. This can be viewed from a perspective that embeds energy in a broader idea of managing socio-technical change,⁷⁸ and in which the focus is on the policy process.⁷⁹ At the very least, a reorganization of how government departments and institutions deal with energy security, in contrast to the current ad hoc or crisis-based approach that prevails in many countries, is warranted.⁸⁰ The main argument here is that the confusion in debates over what energy security entails is influenced by how responsibilities are distributed and overlap within the governmental apparatus, and hence the notion of how energy security policymaking is structured within government has to be an important part of the debates.

What this succinct list of more comprehensive approaches highlights is the need for societies to ask difficult questions about the meaning of security in this context, through a rethinking of the relationship between energy, states, and societies. As this report demonstrates, definitions of energy security that are too restrictive potentially preclude appropriate and durable solutions to manage the problem. What sophisticated approaches share then is the general objective to ensure debates are not constrained to particular visions or interests, given their far-reaching implications for societies.

⁷⁵ David M. Sweet, “The Decentralized Energy Paradigm,” in Gal Luft and Anne Korin (eds.), *Energy Security Challenges for the 21st Century* (Santa Barbara: ABC-CLIO, LLC, 2009), p. 308.

⁷⁶ *Ibid.*, p.311.

⁷⁷ *Ibid.*

⁷⁸ See Meadowcroft, “Governing the transition to a new energy economy.”

⁷⁹ Staffan Jacobsson and Volkmar Lauber, “The Politics and Policy of Energy System Transformation – Explaining the German Diffusion of Renewable Energy Technology,” *Energy Policy*, 34 (2006), pp. 256-276.

⁸⁰ CFR, *National Security Consequences of U.S. Oil Dependency*.

5 Conclusion

The main conclusions from this report all fall under a general need to at least recognise and bring together the various approaches to energy security issues.

The classic foreign policy and military view and definition of energy security is left wanting and fails to explain the complex realities of national and global energy issues. At its heart the approach is short-term, crisis specific, and/or wedded to the status quo (or perhaps status quo ante in certain circumstances). In addition, military responses to energy crises are unlikely to resolve issues in the short or longer term.

The economics approach is perhaps more convincing but leaves open questions about security and perception of security in a crisis and/or how constraining energy supply has been used as political weapon.

The environmental approach is more holistic, but seemingly remains an add-on to the other definitions, and would require fundamental political and social shifts in democracies before it had real salience and impact. Given the complexity of ‘energy’ and ‘energy supply’, the tendency to simplify in political discourse suggests terms like energy security will continue to be used, but their real meaning may not be clear to all actors.

Canada seems to be a particular case for the future of energy markets. Many observers of the energy scene point to the fact that Canada’s potential to play a major role is buttressed by its vast amounts of most energy resources, being the world’s largest producer of uranium, third largest producer of natural gas, fifth largest producer of crude oil, seventh in electricity, and thirteenth in coal—to say nothing of the considerable amount of reserves or various kinds left.⁸¹ At the same time, it is one of the rare major exporters with few impediments to private investment in resource exploitation, and Canada does not present political instability problems found in many energy-exporting countries. Nevertheless, several commentators have highlighted the persistent lack of national leadership in the design of a coherent national energy policy, which has been characterized by ad hoc responses and interventions strongly influenced by the United States, if Canada is to truly become an ‘energy superpower’⁸²—although this leadership will (at least in the short term) be complicated by the structure of Canadian federalism in energy matters.

As for importing countries, of which most of the industrialized world and increasingly larger parts of the developing world consist, ensuring open and comprehensive consideration of energy, security, and energy security requirements are a characteristic of future discussions seems like the only way for societies to face up to some hard choices about their energy futures. Furthermore,

⁸¹ Pierre R. Alvarez, Michael Cleland, and Roger Gibbins, *National Energy Security from an Exporter’s Perspective: The Canadian Experience*, Prepared for the North Pacific Energy Security Conference, Honolulu, December, 2008, pp. 15-16.

⁸² See for example Parkland Institute, *Toward an Energy Security Strategy for Canada: A Discussion Paper*, University of Alberta: Parkland Institute, 2005; Annette Hester, “The New Global Energy Geopolitical Game: Is Canada Ready to Play?”, *A Changing World: Canadian Foreign Policy Priorities* (2), Canadian International Council, 2009; Alvarez, et al., *National Energy Security from an Exporter’s Perspective*.

international cooperation will be crucial in ensuring any kind of energy security, and certainly attention will need to be given to coordination between the various international and regional organizations that deal with energy and security matters.

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The debates over energy security in the 1970s, having burgeoned amidst the transformation of energy markets following the oil shocks, were at the time mostly based on narrow geopolitical and economic views related to the security of a reliable and affordable supply. Since then, the meaning of energy security has evolved and come to encompass a broader range of considerations. This Contract Report is intended as a survey of the debates over energy security in their contemporary form. The discussion revolves around two interrelated themes: first, the complexity of the concept of energy security and the overlapping but at times disparate debates that occur around the concept; second, the differing policy interventions that follow from attempts to render energy more “secure.” The purpose of this Report is to highlight how the politics surrounding the concept of energy security in a contemporary setting influence policy intervention(s), and the implications of the policy choices therein. Given the persistent saliency of energy security in public and political debates in recent years, it is crucial to find ways for coherent discussions over comprehensive sets of policy choices to take place and help deal with this issue.

Les débats sur la sécurité énergétique ont proliféré au cours des années 1970 dans la foulée de la transformation des marchés de l'énergie qui a fait aux chocs pétroliers. Ils reposaient alors sur des conceptions étroites de la géopolitique et de l'économie concernant l'accès garanti à des approvisionnements fiables et abordables. Depuis, la signification de la sécurité énergétique a évolué et englobe désormais un large éventail de considérations. Le présent rapport se veut un bilan des débats modernes sur la sécurité énergétique. La discussion porte sur deux thèmes interdépendants : premièrement, la complexité du concept de sécurité énergétique et les débats parfois redondants, parfois discordants qui l'entourent; deuxièmement, les interventions stratégiques diverses qui découlent des tentatives visant à mieux « garantir » l'approvisionnement. Le rapport a pour objectif de mettre en relief la façon dont les politiques liées au concept de sécurité énergétique dans un contexte contemporain influencent l'intervention politique. Il traite également de l'incidence des choix politiques. Étant donné la place prépondérante que n'a cessé d'occuper la sécurité énergétique dans les débats publics et politiques au cours des dernières années, il faut absolument trouver le moyen de favoriser un débat cohérent sur un ensemble de choix politiques complet dans le but de faire avancer cette question.

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Carter Doctrine; climate change; coal; dependence; Energy Security; environment; gas; interdependence; nuclear power; oil; OPEC

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