
The Institutions of Energy Governance in China

Philip Andrews-Speed

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IFRI
27 RUE DE LA PROCESSION
75740 PARIS CEDEX 15, FRANCE
PH. : +33 (0)1 40 61 60 00
Email : ifri@ifri.org

IFRI-BRUXELLES
RUE MARIE-THÉRÈSE, 21
1000 - BRUXELLES, BELGIQUE
PH. : +32 (0)2 238 51 10
Email : info.bruxelles@ifri.org

SITE INTERNET : *Ifri.org*

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Introduction

The manner in which mankind manages and uses energy resources is currently of great concern to governments and peoples around the world. Fears of supply shortages, tensions over access to resources and apprehension over the predicted negative impacts of climate change have greatly enhanced the need to improve the quality of governance of energy, at both national and supra-national levels. Yet efforts to improve the quality of governance are all too often constrained by poor understanding on the part of those involved in the formulation and execution of energy policy: poor understanding of the technical and economic characteristics of the energy sector, and poor understanding of the political economy of the energy sector in their own countries. But the greatest obstacle to enhancing the degree of constructive engagement between nations in the field of energy lies in the ignorance of the frameworks for energy governance in other countries.

International collaboration, in any form, requires trust, and such trust is built on understanding. In the case of collaboration in the field of energy, potential partners need to have an appreciation of frameworks for energy governance in each others' countries. Only then can they accurately interpret the data, the statements and the declared commitments provided by other parties.

Nowhere is this ignorance of greater relevance to today's challenges than the case of China. The size and rate of growth of China's economy, of its energy demand, of its energy imports and of its atmospheric emissions of various types make this country an essential major partner in any regional or global discussions relating to the production and consumption of energy. Yet such is the size, diversity, complexity and lack of transparency characterizing China's energy sector that external parties find it very difficult to interpret the information emerging from the country and the actions and statements of the government. No shortage of information exists. Indeed it might be argued that there is too much information on China's energy sector: too much information and not enough understanding.

The premise of this chapter is that an improved understanding of the institutions of governance of China's energy sector will allow us

Philip Andrews-Speed, Centre for Energy, Petroleum and Mineral Law and Policy,
University of Dundee

to better appreciate current structures and policies, past policy decisions and outcomes, and the possible trajectories for future policies and policy outcomes. In short, it should provide us with valuable insights into events, trends and behaviors.

To address this apparently simple objective requires an examination of a wide range of issues, including the origins and nature of China's institutions of governance, the processes of policy-making and policy implementation, and the priorities and behaviors of actors in the energy sector. This would allow an assessment of how well suited the institutions of governance are to addressing China's current and emerging energy challenges, especially in respect of the formulation and implementation of new policies to address these new challenges in a sustained manner.

Attempts to understand the political economy and governance of China's energy sector were first stimulated by the energy crisis of the 1970s¹. But it was the opening of the energy sector to foreign involvement that brought the first systematic attempt to analyze policy making and implementation, reflected in the classic works of Lieberthal and Oksenberg.² The growing global importance of China's energy sector in the first years of the twenty-first century has seen a wave of publications seeking to throw light on the governance of this sector.³ A number of these accounts have explicitly or implicitly drawn on the vocabulary and concepts of new institutional economics, an interdisciplinary field of the social sciences which provides a useful way to analyze institutions of governance. When integrated with an appreciation of the role of ideas on policy, new institutional economics provides a powerful framework to understand the forces which drive or constrain policy changes and economic development.

This chapter builds on these works by focusing explicitly on the institutions of governance and on the role of ideas in order to identify the main determinants of the nature of the current institutions of energy governance in China, and thus the main determinants of the nature of policies affecting the energy sector and of their outcomes. The main objective is to elaborate the nature of the forces which drive or constrain change within China's energy sector. It is intended as a preliminary account, sketching out some key variables and examining how they may be interpreted as affecting processes and outcomes

The first section outlines the concepts which will be applied to the analysis and develops a framework for identifying a number of drivers and constraints for change within a national energy sector. In the next two sections the concepts relating to institutions are

¹ Harrison (1977); Hardy (1978); Woodard (1980).

² Lieberthal and Oksenberg (1988).

³ Constantin (2007); Andrews-Speed (2004); Kong 2006; Downs (2006); Meidan *et al.* (2009), Rosen and Houser (2007).

elaborated in the context of China, firstly, with respect to embedded institutions and, secondly, with respect to the institutional environment. The subsequent section applies this understanding to a number of facets of the governance of China's energy sector in order to identify the roles that institutions, ideas and other variables have played in determining the path of China's energy policies. The concluding section draws out briefly the implications for future energy policy development in China.

Policy Change: Drivers and Constraints

The academic literature on government policy-making and implementation is extensive and draws on many disciplines. This section does not aim to review this literature, but rather it briefly examines selected concepts and approaches which can be used in combination to try to elaborate the drivers and constraints on policy change. It starts with an examination of relevant concepts on governance and institutions, with special emphasis on the approach taken in the field of new institutional economics. This approach is then supplemented by including the role of new ideas and of discourse. The section ends with a simplified framework for examining the role of institutions in policy change in China.

Governance and institutions

The word 'governance' can be interpreted and applied in different ways. For international economic organizations, governance involves the management of economic and social affairs by government; for example through the allocation of public resources and the resolution of conflicts between actors, through the exercise of political authority, through the establishment and operation of institutions and through the formulation and implementation of policies.⁴ Measures of governance quality include accountability, participation, predictability, transparency, efficiency and effectiveness.⁵ A broader and more overtly political approach takes into account democratization, human rights and social equity.⁶

In contrast, transaction cost economics and new institutional economics express the concept of governance in much more general terms. In the words of Oliver Williamson "Governance is an effort to craft order, mitigate conflict and realize mutual gains".⁷ This approach focuses on the governance of transactions where a transaction is defined as the transfer of a physical good, a commodity, a legal right

⁴ World Bank (1992).

⁵ Asian Development Bank (1995).

⁶ Howell (2004).

⁷ Williamson (2000).

or a natural resource between actors.⁸ In this context a governance structure may be “thought of as an institutional framework in which the integrity of a transaction, or related set of transactions, is decided”.⁹

This then leads us to the question of identifying and describing institutions. The study of institutions and of their significance in policy and economic development is far from new, and a number of different approaches have been taken.¹⁰ The strength of new institutional economics has been its ability to build on the principles of transaction cost economics by drawing on other sub-disciplines of economics as well as on the fields of political, sociology and even psychology to explain economic and political phenomena. Indeed the sheer diversity of influences on the field of new institutional economics has led to a diversity in understanding of the nature of ‘institutions’.¹¹

Two complementary approaches are used to inform the current analysis. The first defines institutions as “humanly devised constraints, formal and informal, and their enforcement characteristics”.¹² The second approach elaborates this definition and sees institutions as a shared set of beliefs and expectations, represented by rules, which govern social and economic interaction.¹³

These two approaches have been integrated by Williamson in a scheme which identifies three levels of institution.¹⁴ At the highest level are informal institutions which characterize the society in question. These include traditions, norms, customs, beliefs, and expectations, or, in other words, the prevailing culture. Far from being consciously devised by humans, these characteristics are deeply embedded in the society and are likely to have a long history.

At the second level are the formal institutions which have been designed by humans. Most important in the study of economics are the political system, the bureaucratic structures of government, the judiciary and legal system. Also of great importance are the general features of the law relating to property rights, contract and dispute resolution, systems for policy making and implementation, and the role of civil society.

At the third level are the structures which govern individual transactions, for example firms, markets, government bureaux, networks, and various hybrid structures. Conventional transaction cost economics focuses on these institutions, on explaining why

⁸ Williamson (2000); Hagedoorn (2009).

⁹ Williamson (1996, p.11).

¹⁰ Hall and Taylor (1996).

¹¹ Kingston and Cabellero (2009).

¹² North (1990, p.3).

¹³ Aoki (2001, p.10); Greif (2006, p.33).

¹⁴ Williamson (2000).

different types of structure evolve in different sectors or industries, and on examining the way in which these structures shape the way transactions are carried out.

This 'model' as originally presented by Williamson sees a vertical linear relationship between levels 1,2 and 3, with level 1 at the top and with each level providing a strong determining force on the level below and ultimately on the actual transactions themselves. Though the scheme allowed for limited feedback from lower to higher levels of institution, it has since been argued that institutions can be changed through the repeated actions of individual economic actors.¹⁵ Thus the formal institutions and the institutions which govern individual transactions may be shaped as much by actors' behavior as by higher level institutions. Given that the behavior of actors in turn may be greatly shaped by embedded beliefs and norms, the linear scheme of Williamson may be usefully adapted to a circular scheme (see Figure 1).

The most significant implication of the new institutional economics approach to analyzing economic history is that institutions constrain the pace and direction of economic and political development. North and Greif, among others, have convincingly shown that this framework assists in identifying the variables which appear to have played a key role on determining the different paths of economic and political development taken by different nations at different times.¹⁶ In other words, the institutions themselves, as well as the policies, are path-dependent and as a consequence, the development of a nation or of a society is also highly path-dependent.

As well as helping to explain why certain societies were able to take advantage of new circumstances, the study of institutions can assist in identifying pressures for change. Incompatibility or 'friction' between different levels of institution or between institutions may create instability in the governance structures and provide the opportunity or the necessity for change.¹⁷ In the terminology of transaction cost economics, a failure to align governance structures with transactions leads to a failure of governance, and to subsequent conflict and eventual crisis.¹⁸

The role of ideas, social learning and discourse

The importance of ideas in the evolution of institutions and policies is explicitly recognized by new institutional economics through its inclusion in the embedded informal institutions which provide the

¹⁵ Aoki (2007).

¹⁶ North (2005); Greif (2006); Blyth (2002).

¹⁷ Lieberman (2002)

¹⁸ Williamson (2002)

framework for formal institutions and which underpin societal behaviors. But ideas also play a significant role in the policy-making process, in the operation of the institutions of governance and in the behavior of actors.¹⁹ This role may constrain change or may stimulate change.

'Old' ideas take the form of mental models or paradigms within which political agendas are set and policy choices are made. On the one hand, these paradigms constrain change because decisions about what issues are important and what actions to take are all made within the framework of the prevailing paradigm. On the other hand, an actual or perceived failure of a paradigm, or rather of the policies flowing from a paradigm, provides the opportunity for the introduction of a new idea or new paradigm. The appearance of new ideas, even without the failure of the old paradigm, may also provide an opportunity for change.²⁰

The reaction of government and society to paradigm failure or to the appearance of new ideas is highly variable. In principle, an opportunity for change may be provided by the failure of a policy or of a paradigm, or by incompatibility or friction between prevailing ideas and institutions of governance.²¹ Yet government and society are often willing to accept *ad hoc* adjustments which are made to policies rather than reject the paradigm. This then creates internal inconsistencies within the prevailing policy paradigm. Indeed, a 'new' idea may be presented as being consistent with the 'old' paradigm, even though it is self-evidently in contradiction.²²

Policy changes involve social learning. First order policy changes, such as adjusting the instruments of policy, and second order changes, such as introducing new instruments, require social learning solely within the state itself. In contrast, third order policy changes, such as the adoption of a new paradigm or a totally new set of goals, requires social learning across society. Policy entrepreneurs are needed to 'sell' the ideas both within government as well as to economic actors and to society at large.²³ The need for extensive social learning is not restricted to the introduction of new policy paradigms but is also relevant to the introduction of new institutions, such as the rule of law.²⁴

The success of these policy entrepreneurs in persuading all the parties to accept the new paradigm or new institution depends not just on the extent of failure of the old paradigm and of the degree of attractiveness of the new paradigm. Success or failure also depends on the way in which the ideas are framed for the wider public and on

¹⁹ Beland (2005).

²⁰ Hall (1993); Beland (2005).

²¹ Lieberman (2002); Schellenbach, 2007

²² Cox (2004); Hall (1993); Beland (2005).

²³ Hall, (1993).

²⁴ Engel, (2008).

the systems of discourse prevailing in that society.²⁵ Even a radically new idea must be framed in a way which appeals to existing values and ideas.

Discourse is a key way to gain wider engagement in the policy process and two types of discourse may be identified. 'Coordinative' discourse relates to the process of policy making. 'Communicative' discourse involves the persuasion of wider society. In societies where power is concentrated in the hands of an elite or where policy-making takes place within an elite group, the primary role of discourse is communicative, to persuade the general public. In contrast, in more pluralistic societies, a greater emphasis is placed on coordinative discourse and thus a much wider involvement of society is achieved in the process of policy formulation.²⁶ Thus, the nature of the discourse and the role of discourse in policy change and economic development are heavily dependent on the nature of the prevailing institutions, especially the informal, embedded institutions.

Finally, new policies require implementation. The process of implementation will be eased if the new policy has been framed in a way which is consistent with wider beliefs and norms and with the institutional framework, and if there is widespread understanding and agreement with the policy. Further the government needs to invest political effort and administrative resources. In terms of new institutional economics, the critical concern is the degree of fit between the formal institutions of governance and the new policy instruments which govern individual transactions, and also between these new policy instruments and the transactions themselves.²⁷ Factors such as the structure and functioning of government bureaux, of the nature of any federal system of governance and the nature of the legal system are central to such an analysis.

Drivers for and constraints on policy change

The preceding account identifies a number of aspects of the manner in which institutions and ideas may drive or constrain policy change and economic development. But many other factors are also important (Figure 2). In the context of the current analysis, we will distinguish factors which are endogenous to the institutional systems from those which are exogenous and relate to other, often no less important, variables.

The main endogenous forces constraining change include the different dimensions of institutional structure, as well as the vested interests of actors seeking to resist change, and the failure of newly

²⁵ Beland (2005).

²⁶ Schmidt (2002).

²⁷ Williamson (2000).

introduced policies or paradigms. On the other side, endogenous factors which may drive change include various types of 'friction' or incompatibility between institutions, policies and ideas, the failure of a pre-existing policy or paradigm, and the political and institutional entrepreneurs who seek to stimulate change.

One further important variable lies within the context of institutional structure, but which has not been explicitly addressed above. In terms of Williamson's presentation of the three levels of institution, explicit formal policies and their expression as policy instruments lie within the levels of the institutional environment and of the institutions which govern individual transactions. When a specific sector is being analyzed, it is useful to distinguish policies which are directed specifically at this sector from policies which either govern all sectors or which govern other sectors which have links with the energy sector. Given the central position of energy in any modern or modernizing economy, a large number of sector policies have close links with the energy sector, most notably macro-economic policy, industrial policy, financial and banking policies, foreign policy and social welfare policies. For this reason, the heading 'policies in other sectors' is explicitly identified as a variable, within the institutional framework, but external to the energy sector. These policies may variously act as a driver or as a constraint on policy innovation and change in the energy sector.

Outside the realm of institutions of governance lie a number of variables which may play a strong or even predominant role in driving or constraining change. Constraining factors which are exogenous to the institutional structure are of three types. The first, and arguably the most important, is the nature of the primary energy resource endowment and the existing energy infrastructure in the nation under consideration. The primary energy resource endowment cannot be enlarged or its composition changed. In the case of non-renewable resources, it can only be depleted. Most energy infrastructure is built at great cost to last 20-30 years or longer.

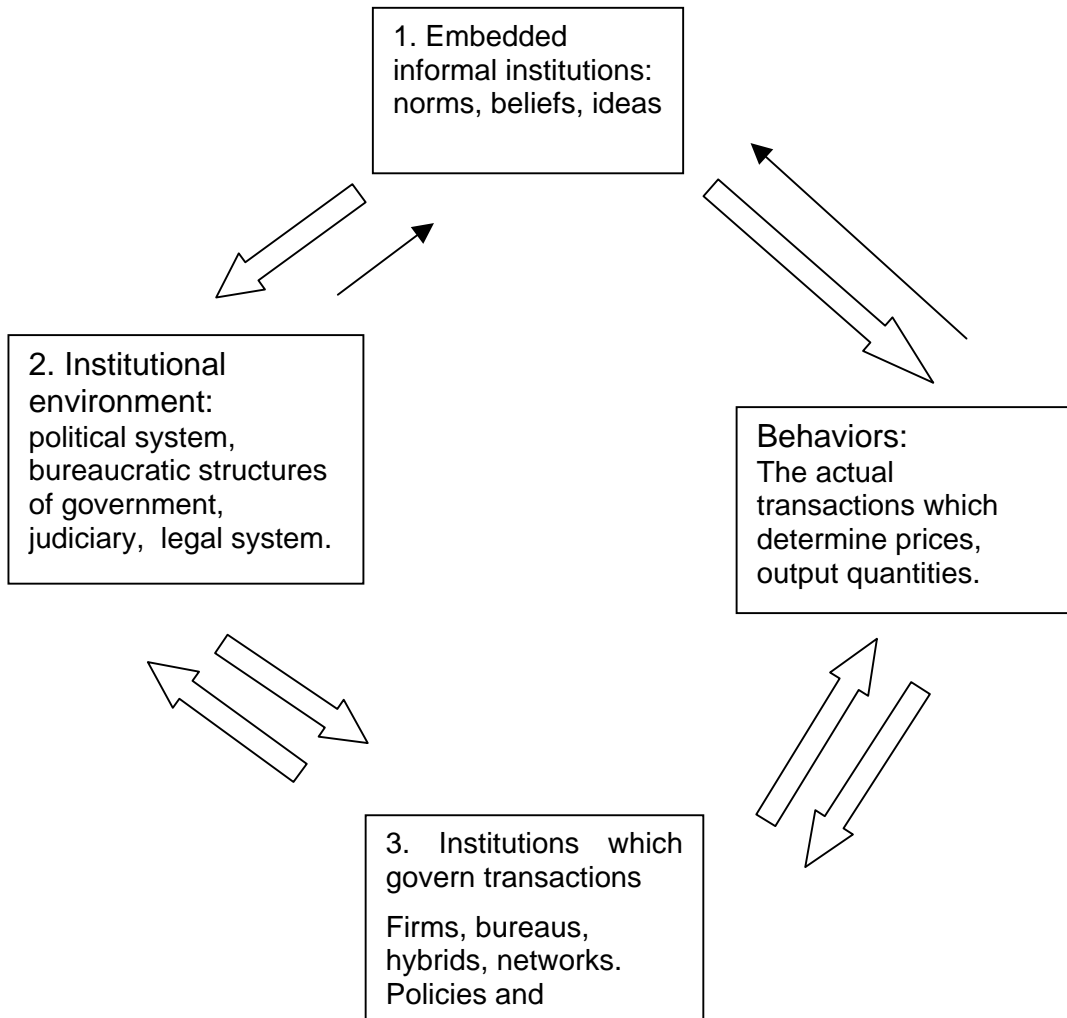
The second variable relates to the critical and often quite unpredictable role that 'events' can play in driving or constraining change. Events, trends or other changes may provide the necessary rationale or impetus to persuade a government to enforce a long-contemplated change. Conversely, an event may convince the government that certain policy options are not feasible and should be abandoned. These events, trends or changes may be political, economic, social or even physical in nature, and may be domestic or foreign.

Finally, the proposed scheme includes new technologies, for these always have and will certainly continue to play a vital role in the development of the energy sector. New technologies have the potential to offer dramatic opportunities to change the manner in which the energy sector is managed and in which long-term strategies are formulated. Such technologies relate to the extraction

of primary resources, the generation of renewable energy, the transformation of energy into useful forms, the consumption of energy, and the management of the environmental impacts of energy production and consumption. Though new technologies are indeed a driver for change, they operate within the wider context of all the other variables identified (Figure 2).

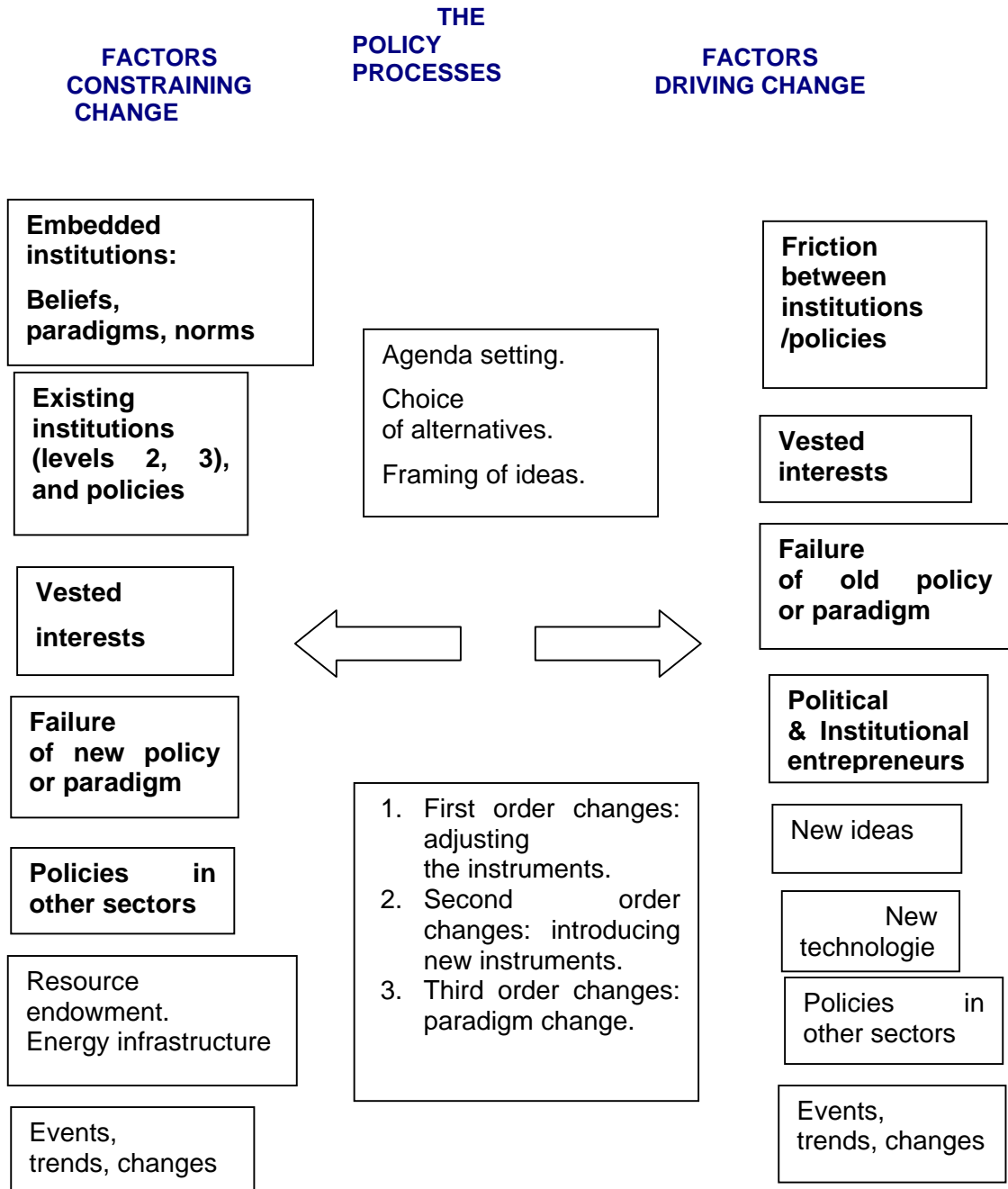
Figure 1. A diagrammatic representation of the three levels of institution and how they determine or constrain behaviors in transactions

(Wider arrows indicate greater influence)



Source: Adapted from Williamson (2000)

Figure 2. Factors driving and constraining change
 (Factors in bold relate to institutions)



China's Embedded Institutions

As described above, the analysis of embedded institutions focuses on beliefs, ideas and norms which are embedded in the culture and which shape behavior. Three types of belief and norm may be identified:²⁸

- Behavioral beliefs: beliefs about behavior of others
- Internalized norms: socially instituted behavioral standards
- Internalized beliefs: mental models and paradigms

In this section we examine a limited selection of features of China's embedded institutions which can help elaborate our later analysis of the governance of China's energy sector, looking firstly at behavioral beliefs and internalized norms and secondly at specific mental models and paradigms relevant to the energy sector.

Behavioral beliefs, internalized norms and governance

A thorough analysis of China's long cultural history and its influence on societal behaviors and on state governance is far beyond the scope of this chapter. But it is essential to examine, albeit briefly and superficially, some aspects of this complex subject in order to shed light on what we observe today in China's energy sector.

China's culture is deeply influenced by its origins as a hydraulic agrarian regime. Such regimes tended to be characterized by a high degree of central control and a lack of tolerance of alternative centers of power. Indeed, unlike in post-feudal Europe, stable and long-lived alternative centers of power such as the landed nobility, the church and the city merchant guilds did not exist in Imperial China. On the one hand, the central government exerted considerable control over those resources and behaviors which were

²⁸ Greif (2006, p.36-37).

critical to its retaining power. On the other hand, such was the size of its realm that the state was willing and indeed obliged to leave many aspects of family and village life outside its purview.²⁹

Critical to the longevity of China's imperial history was the role of ideology in building and sustaining a moral order, and the consequent preference for conformity and acceptance of a highly hierarchical society.³⁰ In the absence of alternative centers of power or of structures of civil society, the family became the critical unit of society, supplemented by wider networks of personal relations, known in Chinese as *guanxi*.³¹

These long-lived structures and pressures have led to one further characteristic of Chinese society that sometimes baffles outsiders, which is the approach taken to the balance between 'truth', on the one hand, and ritual and appropriate action, on the other. Without delving too deeply into what is a complex and contentious subject, it is not unreasonable to assert that the search for and a striving to adhere to a 'pure' theoretical truth plays a less important role in determining individual behavior in Chinese society than it does in some other cultures. Rather, individuals in China have a tendency to attach greater importance to the appropriateness of their words and actions in the prevailing social context, and on anticipating the consequences of these words and actions. Form may often be of much greater importance than substance. This culturally embedded characteristic was re-emphasized by Mao who asserted that truth should not be based on theory, emotions or religion, but be based on social practice.³²

The implications of these general features of China's culture on the systems of governance and on individual behaviors are profound. Here we just note a few which can be interpreted as having significant potential to affect the governance of the energy sector.

Chinese government under the rule of the Communist Party has remained highly centralised, at least in principle, and government and society continue to be strongly hierarchical.³³ Though the number of individuals and organizations involved in elite policy-making is growing, the process remains centralised and low in transparency. Within the political elite lies a fundamental tension. The policy-making process may be obstructed by deep rivalry between factions based on *guanxi*, loyalty and, possibly, ideology, and yet the elite must present a public face of consensus. The policy process and this factionalism rarely percolate down to society as a whole. As a consequence, the characteristics required by those aiming to reach the summit of political power are those relating to loyalty and to skills

²⁹ Wittfogel (1952, mainly p. 101-136).

³⁰ Pye (1992, p. 12-16, 238-240).

³¹ Jenner (1992, 103-128).

³² Blum (2001, p. 86-87, 124-125, 157-159).

³³ See for example: Pye (1992); Lieberthal (1995); Fewsmith (2001); Oksenberg (2001); Dittmer (2001).

in bureaucratic competition and negotiation, rather than those relating to formulating and pushing through specific policies and the ability to communicate with society as a whole. Rhetoric and slogans remain a key tool for the state to communicate important ideas and changes in policy to society at large, but individual acts of persuasive oratory are rare. Rather, leaders and bureaucrats seek to outdo each other in their repetition of the consensus view encapsulated in slogans.³⁴ Against this perspective must be set the real and effective steps which the government has taken to increase the professionalism of the civil service, the incentives they are offered and the systems within which they operate.³⁵

Guanxi forms an important feature of both political and economic spheres in China. This phenomenon has many expressions. At one extreme the term *guanxi* can refer to a purely personal relationship with few overt obligations beyond those of an emotional bond. At the other extreme, is the 'instrumental' form of *guanxi* where one or both of the parties build the relationship in the expectation of a material return. In between and overlapping these extremes are numerous dimensions of human relations relating to social behavior and the search for consensus as well as loyalty.³⁶

In addition to its role in elite politics mentioned above, the practice of *guanxi* brings two important practices to China's economic activity, one largely beneficial and the other definitely harmful. The first relates to the networks which entrepreneurs and companies build up in order to gain access to resources, to share information, to smooth flows in incomplete markets, and to seek protection from events and from the government in the absence of strong institutions and the effective rule of law. Indeed it can be argued that such networks have not only played an important role in driving China's economic growth, but have also shaped China's evolving institutions of governance.³⁷ Though the need for and the practice of *guanxi* may be diminishing in society itself, the practice appears to be flourishing in business and industry, not only between private parties but also between the public and the private sectors.³⁸ This latter relationship tends to take the form of clientilism, whereby the patron is more powerful than the client. In contrast, *guanxi* is, or is more likely to be presented as a relationship between equals.³⁹

In its harmful forms, *guanxi* underpins the prevalence of corruption in China, and is further supported by its cousin, clien-

³⁴ Pye (1992, p.197); Lieberthal (1995, p 173).

³⁵ Burns (2004).

³⁶ Guthrie (1998); Guo (2001)

³⁷ Horowitz and Marsh (2002); Hsu (2005); Krug and Hendrichske (2008); McNally (2008a).

³⁸ Yang (2002)

³⁹ Pye (1992, p.21); Sapio (2009)

tilism.⁴⁰ A full examination of all forms of malfeasance and official misconduct is not relevant to our analysis. Rather our focus will be economic corruption of different types, whereby public power is used for private gain. In most cases the corrupt parties are seeking through illegitimate means to gain access to rents which have been created by prevailing systems of economic governance.⁴¹ This may involve individuals, groups and even entire organizations. Practices which have been particularly significant in China in recent years include abuse of the previous dual-pricing systems, obstructing the entry of new players into a market, abuse of public funds, manipulation of public investment and procurement procedures, and abuse of the process of privatization of public assets.⁴² At a much larger scale, it is possible to classify as corruption the practice whereby government seeks to protect its own economic interests or those of state companies through administrative monopoly. This practice may be applied at the level of an industrial sector or across an administrative region.⁴³

Whilst it is clearly very difficult to document reliably the changes in the scale and type of corruption, a number of general features may be identified. The total number of incidences of corruption appears to have grown during the 1990s, both in absolute terms and as a proportion of aggregate acts of malfeasance. Though, the total number of new cases of corruption stabilized or even fell in the late 1990s, the proportion of major cases involving high level officials and large amounts of money grew.⁴⁴ This trend seems to have been accompanied by the expansion of overt, collective corruption, reflecting the tightening embrace between political power and capital wealth.⁴⁵

Alongside corruption lie the long-standing practices of false reporting and feigned compliance which have characterized the behavior of government officials in China for centuries and have persisted through Mao's rule to the present day.⁴⁶ The origins of these behavioral patterns lie not just in the preference for outward harmony over truth, in the weak accountability of public officials and of the near absence of effective checks and balances to their behavior, but also in the nature of the incentives officials face. Since the 1980s the focus of government policy has been on economic growth and the performance of government officials at all levels, at least those involved in economic activity, as been measured in purely economic terms, most usually GDP growth or some other

⁴⁰ Hsu (2005)

⁴¹ Wedeman (2004); Ngo (2009); Sapio (2009)

⁴² Guo (2008); Ding (2000)

⁴³ Guo and Hu (2004)

⁴⁴ Wedemann (2004); Guo (2008)

⁴⁵ Gong (2002).

⁴⁶ Pye (2002, p.237); Lieberthal and Oksenberg (1988, p.23); Tsai (2008).

concrete economic target.⁴⁷ In Mao's time, it was little different, but then the targets were physical output rather than economic growth. In the absence of effective external audit, officials are easily tempted to produce statistics which match or exceed the targets required of them.

Mental models and paradigms

Mental models or paradigms are frameworks which individuals and groups use to interpret events and phenomena and to frame ideas and policies. The importance of paradigms to the formulation and implementation of energy policy has been emphasized in recent years, for example with respect to the United Kingdom.⁴⁸ Three types of paradigm may be identified which have direct relevance to China's management of energy and natural resources. These relate to man's relationship with nature, to a preference for self-sufficiency and to a drive by the state to control the use and management of natural resources.

The country's main ancient philosophical traditions explicitly addressed the relationship between man and nature and emphasized the close inter-dependence between them. Whilst both Confucianism and Taoism stressed the need for balance between man and nature, both strands of belief included adherents who believed that man had the power to control and conquer nature.⁴⁹

More convincing than any arguments based on philosophy is the evidence from history itself. Indeed the very seeds of Chinese civilization germinated on the realization that man needed to control water. Four thousand years ago the Emperor Yu was the first ruler to systematically carry out extensive large-scale projects for flood control, irrigation and inland water transport.⁵⁰ Thereafter, the constant struggle to gain political power and then to retain it led to an environmentally-destructive cycle of warfare and economic development. Respect for nature remained subordinate to the call of power.⁵¹

This was not a feature of China alone, but lay at the heart of the rise of other early 'hydraulic societies' in which the control of water lay at the heart of political power, for example in Sumer, Assyria, Egypt and India.⁵² Such an approach to the management of water, the environmental and other natural resources lay in stark contrast to and in tension with the collective decision-making

⁴⁷ Lieberthal (1995, p. 146-147).

⁴⁸ Helm (2007); Mitchell (2008).

⁴⁹ Economy (2004, p.30-36); Miller (2006); Ronan (1978, p.222).

⁵⁰ Ronan (1995, p.190).

⁵¹ Elvin (1998); Economy (2004, p.36-43).

⁵² Wittfogel (1957).

processes that typified local communities in the very same societies and which showed greater awareness of the values of sustainable development.⁵³

The pre-eminence of Communist theory and practice in the governance of China since 1949 has, if anything, accentuated such an approach to natural resources and the environment. The early decades of the Communist regime saw explicit statements to the effect that natural resources were boundless, and what was required was a greater ability to mobilize society to exploit them. Further, economic development should be pursued regardless of the cost to natural resources and the environment.⁵⁴

This approach has expressed itself in various forms, from the unquestioned desirability of building very large dams, the subordination of environmental and social concerns to energy production, and the relatively low priority attached until recently to energy efficiency and social welfare.⁵⁵ Indeed, it has been argued that Mao took historical traditions to new extremes in his calls to conquer nature.⁵⁶ Though many countries and cultures may be accused of taking such an approach to nature at some periods in their economic development, China would appear to be exceptional in the duration and the intensity with which this belief has been held. Such a view should, however, be moderated by consideration of more nuanced analyses of the actual practices of natural resource management in the early years of communist rule which show that efforts were made to constrain or reverse the negative environmental impacts of agricultural development.⁵⁷

China's attitude to self-reliance and external economic relations has varied greatly during its history. The great wealth and variety of its natural resources rendered a policy of self-reliance more viable than in most other countries. Yet the nation was a significant participant in international trade during some of the periods when its economic power was greatest; for example in the Later Han (first and second centuries A.D.), Song (eleventh to thirteenth centuries), Tang (seventh to ninth centuries) and Qing (eighteenth and nineteenth centuries) dynasties. Much of this trade was carried out by foreigners, Middle Eastern, East Asian and European. Only in the Song period did Chinese traders themselves become a powerful force. It was this dominance of trade by foreigners and their unsavory practices which led the rulers of the late Qing dynasty to take a strong, negative approach to international trade.⁵⁸

⁵³ Benvenesti (2008).

⁵⁴ Woodard (1980, p. 13-19).

⁵⁵ Economy (2004); Andrews-Speed and Ma (2008).

⁵⁶ Shapiro (2001, p.1).

⁵⁷ Ho (2003).

⁵⁸ Fairbank and Reischauer (1989); Rodzinski (1991); Spence (1990).

After the Communists took power in 1949, a high degree of self-reliance became an immediate necessity as the West failed to recognize the new regime. The Soviet Union stepped in to provide technology and skills which had the potential to play a key role in the development of the energy and mineral sectors. But China was left on its own when the Soviet Union withdrew its support in 1960.⁵⁹ The search for self-reliance in the energy and mineral sectors was accentuated by the belief that these sectors should drive growth in the rest of the economy.⁶⁰ The rapid development of the Daqing oil field in Heilongjiang Province during the 1960s became emblematic of the 'heroic' self-reliance of the New China.⁶¹

China's distrust of the outside world took a new turn during the world energy crisis of the 1970s and early 1980s. The shortage of oil and the high prices were seen as part of a conspiracy hatched by the rich nations in order to further subjugate the Third World, thus further confirming the need for self-reliance. The crisis was interpreted as a Marxist struggle between the rich and the poor, and as a consequence China welcomed the shift in the balance of power towards the oil-rich states.⁶²

Though the open-door policy introduced in the 1980s did result in foreign involvement in the economy, participation by foreign companies in the domestic energy sector remained restricted to those activities for which foreign technologies and skills were absolutely necessary.⁶³ These included offshore oil exploration, offshore and onshore gas production, nuclear power, liquefied natural gas and the manufacture of large scale turbines.⁶⁴ Indeed, the main objective for the government in inviting foreign involvement in China's energy sector was to maximize the country's ability to be self-reliant in energy supply. This preference for self-reliance was exacerbated during the 1990s after China became a net importer of oil, and is reflected not just in government policy but in the attitudes of citizens, even of university students.⁶⁵

The search for self reliance was accompanied by the preference for direct government involvement in natural resource projects, especially if they were critical to the interests of the state. In Imperial times, the state became closely involved in projects crucial to its power, such as hydraulic engineering, manufacturing weapons and

⁵⁹ Dorian (1994, p.55-62); pp. 56-62; Lieberthal (1995, p.76-77); Brammall (2009, p. 153,363).

⁶⁰ Dorian (1994, p.35-36).

⁶¹ Kambara and Howe (2007, p.17-23).

⁶² Woodard (1980, p. 13-25).

⁶³ Keith (1986).

⁶⁴ Andrews-Speed (2004).

⁶⁵ Constantin (2007); Zweig and Ye (2008).

other military hardware in Imperial Workshops, and the mining of raw materials critical for weapons, for currency and for daily life such as copper, iron, lead tin, zinc, and salt.⁶⁶

State control over industry was an integral part of the economic policy of the Communist Party after 1949, especially for heavy industry.⁶⁷ Government involvement in the energy sector was implemented initially through Ministries for Petroleum, for Coal and for Electrical Power, and, more recently through state-owned energy companies. Despite recent commercialization, these companies remain under relatively tight government control, especially those owned at central government level. This contrasts with the state of enterprises in most other sectors of the economy which have been largely released from government control and, in many cases, fully privatized. Energy, other natural resources and rail transport remain the exceptions to this general trend of liberalization.⁶⁸

During Imperial times, where the state was not itself directly involved, it tended to take a very relaxed view of natural resource exploitation. This was especially notable in the case of mining. Officials tended to dislike unofficial mining operations as these would distract labor from more important agricultural tasks. At the same time, though noting the poor working and living conditions of the workers, they took few steps to address them. Likewise, the state took few steps to create systematic procedures to manage the nation's mineral resources. This contrasts sharply with the body of mining law that had been established in late medieval Europe.⁶⁹

⁶⁶ Ronan (1994, p.3-19); Golas (1999, p.425).

⁶⁷ Brammall, 2009, p.89-91.

⁶⁸ Andrews-Speed (2004).

⁶⁹ Golas (1999, p. 417-427).

The Institutional Environment

As discussed above, the institutional environment comprises the formal institutions of the state, both organizations and systems, including government organizations, political parties and the legal system. Efforts to analyze the nature of the state and of the institutions of governance in post-Mao China consistently encounter the apparent dichotomy between, on the one hand, an apparently powerful central government and a unified system of governance and, on the other hand, a fragmented and chaotic structure over which the central government has little control. Indeed, taking an historical perspective, it has been argued that China “is a civilization trying to squeeze itself into the format of a modern state”.⁷⁰ A further apparent contradiction relevant to the institutional environment can be seen in the deliberate steps the government has been taking to enhancing the role of law in society and in the economy, and yet the rule of law continues to be subordinated to administrative fiat.

This section first examines some of the features of the formal institutions of the state, highlighting the main sources of fragmentation which undermine the authority of the state. It then shows how the Communist Party is a critical unifying factor in counteracting this fragmentation. Finally we identify the key features of the evolving legal system.

Formal institutions of the state

The fragmented nature of China’s institutions of governance was documented in some detail by Lieberthal and co-researchers in a series of publications in the 1980s and 1990s.⁷¹ More recent analyses have drawn conclusions that China is a “dual development state”,⁷² a “polymorphous state”,⁷³ or a “diffuse developmental state”.

This fragmentation affects both the vertical and horizontal links in the formal organizational structures of government. Though China

⁷⁰ Pye (1992, p. ix).

⁷¹ Lieberthal and Oksenberg (1988); Lieberthal and Lampton (1992); Lieberthal (1995)

⁷² Xia (2000).

⁷³ Howell (2006).

remains a unitary state in theory, the last thirty years have seen the development of an increasing degree of *de facto* federalism.⁷⁴ The Center has delegated substantial policy-making powers to the Provinces. Lower levels of government, particularly at the County level, have gained considerable influence over policy implementation. The powers wielded by different levels of government have been acquired, or lost, through bargaining and negotiation.⁷⁵ Only in rare cases have they been defined by law. In the other dimension, the Ministries and other major government agencies form important axes of power from the central government level to as far down as the county.

The impact of this disaggregated structure on policy-making has been exacerbated by three facets of government in China. First, the framework is notably short of formal definitions of the powers and scope of authority of the component institutions, of clear statements of practice and procedure, and of explicit guidelines for inter-institutional relationships. Second, and partly as a result of the first, institutions are highly personalized and dependent on the character, power and connections of the leader, as are relationships between institutions.⁷⁶ Informal networks are of great importance.⁷⁷ Third, the system is very hierarchical. All institutions and all individuals of any importance hold a specific rank, and this rank is a critical determinant of the geometry of policy bargaining.⁷⁸ Negotiation takes place between institutions and individuals of equal rank.⁷⁹

In addition to the fragmented nature of government, the power of the state-owned enterprises remains a critical feature of China's economy. In the days of the planned economy, the large state industries were either ministries or reported directly to a ministry. For this reason the few remaining large state-owned enterprises retain considerable influence at the highest levels of government.⁸⁰ As a result, the largest state-owned enterprises continue to play an important role in policy-making and, partly as a consequence, they are able to retain dominant positions in their respective sectors. Nowhere is this more important than in the energy sector.⁸¹

As a consequence of this fragmentation, multiple centers of power and influence exist and China's governance of economic and industrial policy lacks the key unified sense of purpose and unified governance structure which can be found in typical 'developmental

⁷⁴ Shirk (1992, p.59-60); Goldman and MacFarquhar (1999); Montinola et al (1995).

⁷⁵ Lieberthal (1995, p.292-313).

⁷⁶ Lieberthal (1995, p. 183-218).

⁷⁷ Xia (2000, p.214-218).

⁷⁸ Lieberthal and Oksenberg (1988, p.142-157).

⁷⁹ Shirk (1993, p.92-106).

⁸⁰ Shirk (1993, p.107-115).

⁸¹ Andrews-Speed (2004); Kong (2009).

states'.⁸² To date, China's government has failed to create a 'superministry' to guide industrial policy. Even the steps taken in 2009 to create a set of 'superministries' to govern different parts of the economy failed to effectively address the needs of the energy sector, as will be discussed later in this chapter.

Instead a highly heterogeneous state has emerged from the remains of the Leninist state of Mao. The central government may indeed lost a certain degree of authority over or control over the lower levels of government and of industry, but of greater importance is that the last thirty years have seen a substantial "reconfiguration of state power" and that nature and extent of this reconfiguration varies greatly across the country.⁸³ As a consequence, China today is characterized by contradictory juxtapositions of autonomy and clientilism, developmentalism and predation, and control and chaos. Multiple centers of power, institution building and economic development prevail, and political and economic rivalry exists at and between all levels of government.⁸⁴ Indeed, institution building is driven as much from the bottom, at the local level, as from the top, but the nature and development of these local institutions is highly heterogeneous and greatly dependent on the pre-communist and communist economic and political history in each location.⁸⁵

The Communist Party

Such fragmentation would rapidly lead to a breakdown of government were it not for a number of unifying or articulating instruments. The most important of these remains the Communist Party.⁸⁶ The Party is the most powerful organization in China and is intimately intertwined with all government agencies from central to village level, and with all state-owned enterprises. Even the People's Liberation Army is subordinate to the Party rather than to the government or to the President. As a result the Communist Party is pre-eminent in all major *political* decision-making.⁸⁷

In the sphere of economics it might appear to the outsider that the role of the Party is not so great, and that the government *sensu strictu* wields real power. This distinction may have little meaning for a number of reasons. Firstly, nearly all government officials of any significant rank are also party members and subject to the discipline of the Party. Secondly, most institutions and enterprises have a Party

⁸² McNally and Chu (2006).

⁸³ Baum and Schevchenko (1999).

⁸⁴ Xia (2000); McNally and Chu (2006); Howell (2006).

⁸⁵ Krug and Hendrichke (2008); Horowitz and Marsh (2002).

⁸⁶ Krug and Hendrichke (2008).

⁸⁷ Pollack (1992); Lu (1996); Lieberthal (2005, p. 208-218); Naughton (1996, p. 285); Krug and Hendrickse (2008).

hierarchy which parallels the management hierarchy, and at the top of these hierarchies the Party Secretary nominally or, indeed, actually has more authority than the senior manager. Finally, few important economic policy decisions lack substantial social and political implications.

What has changed in the last twenty years is that power of political ideology as a unifying force has diminished as real differences of opinion and belief have emerged over the speed and nature of economic reform.⁸⁸ Indeed China's success in reforming its economy and sustaining a high rate of growth over the last three decades can be attributed to a great extent to the willingness and ability of the Communist Party to be flexible and to adapt. The top leadership have repeatedly amended its economic policies and strategies, generated new slogans and rhetoric, and modified internal Party organizational structures, systems and incentives in order to suit the prevailing challenges.⁸⁹ Among the more important internal reforms have been the slow introduction of more democratic processes, the institutionalization of the elite succession procedure, an enhancement of the level of technical and administrative competence of party members and officials, and willingness to include private sector businessmen.⁹⁰

Set against these changes are a number of characteristics that have their roots in the Party's Leninist history and even in China's Imperial past. Though less concentrated than before, power within the Party continues to be wielded by a relatively small elite.⁹¹ This elite sees its role as defining the common good and setting the framework for its achievement. Implementation requires the development or adaptation of ideology, of rhetoric and of slogans, and the dissemination through propaganda. The role of society is to follow the Party.⁹² Key policy instruments continue include political and economic campaigns and mass mobilization.⁹³

The period 2001-2005 saw the creation of four successive ideological campaigns, each with their specific policy objectives: "The Three Represents", "The Socialist Human Society", "Scientific Development" and "Democracy with Chinese Characteristics".⁹⁴ For eighteen months during 2005-2006 the Party carried out a rigorous "rectification campaign" for Party members at all levels, which included study groups, self criticisms and criticism.⁹⁵ Campaigns may

⁸⁸ Lieberthal and Oksenberg (1988, p.158-160); Lieberthal (1992); Fewsmith (2001).

⁸⁹ Shambaugh (2008).

⁹⁰ Schevchenko (2004); Fewsmith (2001); Perry (2007); Shambaugh (2008, p. 34-35, 104); Manion (2008); Feng (2008).

⁹¹ Fewsmith (2001).

⁹² Pye (2001).

⁹³ Perry (2007); Shambaugh (2008, p. 128).

⁹⁴ Shambaugh (2008, p.111-124).

⁹⁵ Shambaugh (2008, p.129-130).

be directed at perceived political threats such as the Falun Gong. Outside the political sphere, the Party is able to support the government in policy campaigns. One of the most notable was that to address the challenges of SARS.⁹⁶ In the energy sector such campaigns have been launched to address safety in small-scale coal mines and energy efficiency, as will be discussed below.

As a consequence of this combination of adaptability and use of well-tested techniques, the Chinese Communist Party CCP continues to retain a strong hold over political and economic power in the country and is able to defend attacks on its power.⁹⁷ This authority is reinforced by the Party's tight control over career progression within government and in the wider public sector, as well as in the state-owned enterprises.⁹⁸

Nevertheless the last two decades have some dispersion of power, a loss of importance of the Party at village level, the continued inclusion of incompetent officials, and a decline of reputation on account of the corruption of Party officials.⁹⁹ Further, the Party continues to face a fundamental dilemma in its promotion of market forces whilst still retaining a preference for direct control over key economic sectors.¹⁰⁰

Policy decision-making and implementation

In addition to the Communist Party, a number of other mechanisms hold the fragmented infrastructure of government together. Policy decisions tend to be made by consensus after wide consultation through meetings and the circulation of documents. These are reinforced by personal links and informal institutional networks.¹⁰¹ Research institutes and think-tanks of various types and affiliations have blossomed. These not only provide policy-makers with information, skills, ideas and policy proposals, but they also provide a useful web of links between different strands of government.¹⁰² Unlike their counterparts in the west, few of these think-tanks are independent of government or state enterprises. Despite their dependence on government, their role is not formalized and the way their ideas flow to key decision-makers may be dictated by those top leaders.¹⁰³

⁹⁶ Perry (2007).

⁹⁷ McNally (2008b).

⁹⁸ Cheng (2000); Heilmann (2005).,

⁹⁹ Baum and Svhevchenko (1999); Fewsmith (2001); Shambaugh (2008, p. 122)

¹⁰⁰ Heilmann (2005).

¹⁰¹ Lieberthal and Oksenberg (1988, p. 151-157); Xia (2000, p.214-218).

¹⁰² Halpbern (1992).

¹⁰³ Naughton (2002).

The need for consensus is, arguably, the most significant attribute of China's economic decision-making. Consensus is reached more through bargaining between the parties rather than by persuasion.¹⁰⁴ Bargaining occurs horizontally between government Ministries, agencies and state enterprises, as well as vertically between different levels of government. The leaders of individual institutions are expected to argue for the interests of their institutions and competition between institutions is deliberately encouraged.¹⁰⁵ Institutions and enterprises will jealously guard the information they hold, further enhancing their power over decision-making.¹⁰⁶ Ideas and proposals are only formally synthesized at the level of the Commissions and above.

Though the top leaders prefer decisions to be reached by consensus at lower levels, this competitive environment combined with the ability of any of the parties involved to veto a proposal, results in an upward-directed tide of problems awaiting a decision. These problems accumulate at the level of the Commissions or, more usually, at the State Council, for even the Commissions are subdivided by sector. This process may be described as 'management by exception' and results from the reliance on consensus and the failure to allocate clear responsibility for different types of decision.¹⁰⁷

Thus the political elite, the top leadership, far from being a key initiator of policy often appears to wait for policies to emerge from the lower levels. If consensus has been reached at lower levels of government, the leadership will most likely approve. If the lower levels cannot reach a consensus, the elite either have to arbitrate between competing proposals, choose to drive the policy-making process themselves, or postpone the decision. Given the number of unresolved issues which rise to the highest levels of government, the last of these courses of action, the non-decision, is probably the most prevalent. Only rarely does the top leadership itself formulate and drive through an economic policy initiative. This will occur when the policy issue has key strategic political or economic significance. This has been the case in energy sector in recent years,¹⁰⁸ as will be explained below.

Economic policy implementation in China is plagued by the same structures and processes as policy formulation. Bargaining continues throughout implementation and the lower levels of government have great scope for distortion or non-implementation of policies.¹⁰⁹ Divisions amongst the top leaders, a lack of clarity in the policy documents, or the appearance that the policy initiative is not a

¹⁰⁴ Lieberthal and Oksenberg (1988, p.23-24); Lampton (1992).

¹⁰⁵ Lieberthal and Oksenberg (1988, p. 23).

¹⁰⁶ Halpern (1992).

¹⁰⁷ Shirk (1992).

¹⁰⁸ Constantin (2007).

¹⁰⁹ Lampton (1992).

high priority can each contribute to a failure to implement even if a 'consensus' had been reached in the first place.¹¹⁰ The corollary of relying on consensus combined with the progressive delegation of power to the regions is that any radical initiative imposed by the Center without due process is liable to encounter substantial obstruction and non-compliance. As a result the challenges facing China's central government when implementing economic policy are just as great if not more daunting than those involved in the formulation of policy.

The main consequence of the prevailing political processes for policy-making and implementation in China is that a high degree of unpredictability exists in the government's pursuit of economic and industrial goals. This unpredictability is experienced not just by outsiders who lack access to the political elite but also by those charged with formulating and implementing the policy, and relates not just to the degree with which objectives are achieved but also to unexpected and undesirable side-effects.¹¹¹ In the energy sector, such unintended consequences can take the form of environmental damage, social cost or direct economic cost through wasteful management, as will be examined below.

In democratic countries which have a strong rule of law, the legal system forms a key component of policy implementation as it provides a framework for both private and public parties to challenge abuses of the law. As a result a certain degree of consistency and predictability in the implementation of economic policy should emerge in time. Such a framework is not well developed in China.

The legal system

The approach to law throughout the more than two thousand years of Imperial China arose from an amalgamation of the ideas from two schools of thought, Confucian and Legalist. The result was a highly structured system of law-making, laws, regulations and courts which was directed at promoting and protecting the interests of the state. The law provided no formal constraints on the ruler and no protection for the individual. Indeed the legal system viewed the family as the basic unit of society, not the individual. No separation of powers existed and the legal system was seen as a political tool and as an administrative device to be managed by the government bureaucracy. Punishments were intended to be harsh, yet the nature and level of punishment depended on the status of the individual; the higher the status the milder the punishment. Citizens could gain access to the law, but this was not the prime objective of the legal system. Indeed,

¹¹⁰ Lieberthal (1995, p.164-166).

¹¹¹ Howell (2006).

and possibly because of this, citizens preferred private ordering of disputes rather than submitting to the courts.¹¹² Such a system of law is consistent with Chinese culture favoring a society which is highly stratified and which places little emphasis on the role of the individual.¹¹³

The last years of the Qing dynasty, at the dawn of the twentieth century, saw the start of an attempt to reform the legal system and to adopt attributes of systems from Europe, especially Germany, and from Japan. These efforts were halted by the Nationalists who preferred a more traditional approach whereby the role of law was to maintain social stability. The first thirty years of Communist rule from 1949 was characterized by an almost complete lack of interest in the law, and in the abandonment both of the Nationalist approach and of attempts to import features from the developed economies.¹¹⁴

Since economic reforms started in the late 1970s, the government has made great strides to draft new laws and regulations, to create a new cadre of professional lawyers and judges, and to spread understanding of the importance of the law. In pushing forward these reforms, the government has drawn extensively on international examples, especially in the realm of economic law.¹¹⁵ Constraints to the pace and development of legal reform include the close relationship between the courts and both Communist Party and the local government, for courts are directly responsible to the government at the level at which they operate.¹¹⁶ More fundamentally, the overall approach to the law continues to bear a striking resemblance to that of Imperial times: that is to say that the law is seen as an instrument of government, or even Party, policy to be used to retain power, maintain social order and promote economic development.¹¹⁷ Further, a great deal of social learning is required for citizens to fully appreciate the role of law in a society subject to the rule of law, and this is unlikely to come quickly in a culture dominated by hierarchy and social conformity. Indeed it can be argued that the rule of law is less necessary in a collective culture than in an individualistic culture.¹¹⁸

In terms of the role of law in economic activity, two important features deserve emphasizing. First, the law in China is notorious for failing to provide secure property rights. Rights are poorly defined in law, and government agencies at all levels of government exercise

¹¹² Peerenboom (2002, p.27-43); Chen (1999, p.6-17).

¹¹³ Licht et al (2007).

¹¹⁴ Peerenboom (2002, p.43-46); Chen (1999, p.23-39).

¹¹⁵ See for example: Chen (1999); Peerenboom (2002); Jones (2003); Zhu (2004); Clarke (2007a).

¹¹⁶ Zhu (2004); Clarke (2007b); Liebman (2007); Lam (2009).

¹¹⁷ Peerenboom (2002, p.80-83).

¹¹⁸ Licht et al (2007); Greif (2006, p.294-295).

their 'right' to transfer rights with little due process. Within this context, many enterprises appear to have been very successful at enhancing the degree of protecting of their property rights through the building of networks and the use of *guanxi* involving both public and private sectors.¹¹⁹ Second, citizens, enterprises and public agencies continue to prefer to settle civil disputes through private ordering rather than going through the court system.¹²⁰

¹¹⁹ Krug and Hendrickse (2008); Wank (1999).

¹²⁰ Peerenboom (2007, p.197).

Application to the Governance China's Energy Sector

The preceding two sections have outlined selected characteristics of China's embedded institutions and of the institutional environment which have relevance to the governance of the energy sector. This section apply these findings to the energy sector with the aim of identifying and explaining the major factors which govern behavior and which respectively drive or constrain change in China's energy sector.

This analysis does not intend to be comprehensive in the sense that it applies *all* the considerations examined above to *all* facets of the energy sector. Rather, this account will focus on certain general features of China's energy sector in order to apply selected elements of the preceding analysis to a number of examples from different parts of the energy sector. The features to be examined are policy agenda-setting, new ideas and slogans, wider constraints, governance structures, policy-making and policy implementation.

What has driven energy up the political agenda in China?

Despite the importance of energy to a modern economy and to daily life, the sector is rarely at the top of the policy agenda for national governments for long periods of time. Exceptions are those countries which are major exporters of energy and which are highly dependent on revenues from these exports to support national development. In other countries, energy supply is commonly taken for granted, and the government devotes its attention to other economic or political objectives which are considered to be more important at the time.

It takes a crisis, an impending crisis or an apparent crisis to bring energy to the attention of most governments. Such crises tend to take the form of events or sudden changes of trend which in themselves create a threat, enhance an existing threat, or create or enhance the intensity with which a threat is perceived.

They include an increased probability of the threatened event materializing, an increased scale of impact from such an event, or a reduced ability to react to the threat should it materialize.¹²¹

Most commonly it is a threat to security of supply which brings energy onto the government agenda. The source of the threat may be domestic or international. In the case of China, it is both. Increasing dependence on imported oil over since 1993 and high levels of international oil prices between 2003 and 2008 pushed oil steadily up the government's agenda. But the continued ability of the international markets to supply these imports and of the country to pay for them had the consequence that this increasing vulnerability did not bring oil to the top of the agenda.

In contrast, the realization by China's government in 2004 that the country faced a major shortfall in *domestic* energy supplies, particularly of electricity, brought energy security to the top of the agenda. Immediate and radical action was needed to ensure that the economy and people's livelihoods were not seriously damaged by a shortfall in energy. Attention switched from the production of energy to its consumption, and to the challenge of reducing waste in all parts of the energy supply chain.¹²²

The new importance attached to energy security by China's government was enhanced by renewed worldwide concern during the first decade of the twenty-first relating to the future availability of energy supplies.¹²³ This concern comprised three factors. The first derived from the perception that the level of investment in new oil and gas supply capacity in major exporting countries was inadequate to meet medium-term demand. The second was a resurgence of the belief, widely held in the 1970s and early 1980s, that primary energy resources were close to depletion. Thirdly, the early years of the century demonstrated that the liberalization of electricity markets had created a range of systematic risks which had not been adequately addressed.

Two further issues have brought energy up the agenda around the world. The most prominent of these relates to the environment and, particularly, to global warming. Within China, the negative environmental impacts of the country's dependence on coal have long been recognized by the Chinese government. Though action has and continues to be taken to constrain these impacts, environmental concerns alone have not been sufficient to raise energy up the government agenda. Indeed, even the recently enhanced enthusiasm for addressing climate change builds mainly on the energy efficiency programmes which themselves are driven by security of supply

¹²¹ For a discussion on how such changes have affected thinking on energy policy, see Helm (2007).

¹²² Andrews-Speed (2009a).

¹²³ See for example: Kalicki and Goldwyn (2005); Barton *et al.* (2004); Dannreuther (2007, p.79-99).

objectives.¹²⁴ A further driver for integrating climate change issues into energy policy has been the government's fear of a loss of international reputation should it be seen not to be actively addressing these challenges.

The second issue relates to the need in developing countries to supply inhabitants with modern and clean supplies of energy. China has achieved remarkable success in this respect, for less than 2% of the population now lack access to electricity. As a result, the physical supply of modern energy to all segments of the population is not now a major policy concern, though the appropriate pricing of this energy remains an important priority.¹²⁵

New ideas and slogans in China's energy sector

Against a background of long-held beliefs and socialist values, a number of new ideas relevant to energy and natural resources policy started to enter the thinking of the Chinese government since the 1980s. Whilst they have not caused the abandonment of the earlier beliefs, they have variously created tensions in the processes of policy-making or implementation or have caused adaptations to existing policy. Not surprisingly, most of these new ideas have their source either in the growing internationalization of the country or in its rising wealth.

The first idea of direct relevance to the energy sector entered into the thinking of China's government during the 1990s through the World Bank and other providers of economic advice. The belief that market forces could and should be introduced to the domestic energy sector, even to electrical power, was still relatively new even in the West, and became part of the tide of advice flowing to China.¹²⁶ Zhu Rongji in his position at the head of the State Economic and Trade Commission and later as Prime Minister was a supporter of this approach. As a result, steps were taken during the 1990s and into the early 2000's to restructure the energy industry, to reduce the extent of government intervention in operational management, and to start to introduce market forces to the energy sector.¹²⁷

These steps towards liberalization were constrained by the government's desire to retain ownership and control over key sectors of the economy, such as energy. Thus government, at both central and provincial levels, maintains majority ownership and control over most large energy companies in China, despite steps to

124 Neiderberger et al. (2006); Meidan et al. (2009).

125 Andrews-Speed (2009b).

126 World Bank (1994); Shao et al. (1997); Berrah et al (2001).

127 Andrews-Speed (2004).

commercialize and to list these companies on domestic and international stock exchanges.¹²⁸ In this way have the 'old ideas' constrained the implementation of the 'new'. Given the recent shortages of energy in China and the dubious experiences of energy markets in other countries, this cautious approach is almost certainly to be proven appropriate at this stage of China's development.¹²⁹

An idea which has been embraced with greater enthusiasm has been the need for international economic engagement. Again, this was pushed by Zhu Rongji, and China's accession to WTO is emblematic of his achievement.¹³⁰ However its application to energy has been pursued with a higher degree of selectivity than in other sectors of the economy. Foreign investment in China's energy sector remains difficult and at a low level, including in the wholesale and retail of oil products which have been newly opened under the WTO accession agreement. Long-standing obstacles include policy and legal ambiguity, the market power of incumbents and the pricing systems for oil products and electricity.¹³¹

China has pursued international energy engagement in a number of fields. These relate to overseas investment by state-owned energy companies, the increasing import of energy products, bilateral energy diplomacy with energy exporters, and active participation in international organizations relating to energy.¹³² To a great extent this engagement has been driven by the country's growing dependence on external supplies of oil and, to a lesser extent, of natural gas. Thus the power of necessity has overwhelmed the power of old ideas of self-reliance and isolation in the field of energy in the face of the overriding priority placed on economic growth.

Two sets of ideas specifically relating to energy which have been prevailing around the world have made an impact in China to different degrees. As mentioned in the previous section, the resurgence of the fear of an imminent depletion of certain energy resources has found resonance with the government, and has underpinned its support for overseas investment by national oil companies as well as the growing scope of its energy diplomacy. In contrast, the prerogative to protect the environment, both locally and globally, was not initially embraced by government with the same enthusiasm. Rather, such concerns appear to have been subordinated to the need to maximize economic growth.

¹²⁸ Andrews-Speed and Cao (2005).

¹²⁹ Andrews-Speed (2009b).

¹³⁰ Lardy (2002).

¹³¹ Andrews-Speed (2004); Andrews-Speed (2009b); Wang (1999); International Energy Agency (2009a, p.40).

¹³² Andrews-Speed et al. (2002); Lieberthal and Herberg (2006); Ma and Andrews-Speed (2006); Downs (2000); Mitchell and Lahn (2007).

Nevertheless, the 1990s and first decade of the twenty-first century have seen the government show a greater willingness to recognize the environmental challenges created by thirty years of rapid and poorly regulated economic growth, and a growing willingness to invest political and economic capital in addressing these challenges. This trend has been exemplified by the emergence of new political slogans such as the “conservation society” and “scientific development”.¹³³ Despite these efforts and the elevation of the State Environmental Protection Agency to ministerial status in 2008, many fundamental deficiencies lie at the heart of China’s systems for regulating the environment.¹³⁴

Switching our attention to Chinese society, especially to urban middle-class society, the acceptance of and respect for austerity would seem to be disappearing.¹³⁵ It has been replaced by a wasteful materialism which does not yet appear to be tempered by consideration of the wider impacts of this behavior on the environment. Certainly the last two decades have seen a growth of environmental awareness across society of the extent of and the consequences of damage to the environment, one of the symptoms of which has been the expansion in numbers and degree of activism of domestic environmental NGOs.¹³⁶

Yet China has yet to experience the rebellious, environmentally conscious, “back-to-nature” movements which swept through Europe and North America in the 1960s and 1970s and which, despite their eccentricities, provided an important impetus for the development of today’s appreciation of global warming and other environmental threats. Instead, the growing middle classes in China, as in many countries today, enjoy and expect plentiful energy supplies at low prices. Though they may have some appreciation of or concern for the longer-term costs in terms of security of supply and environmental damage, their perception of the importance of the environment and their willingness to adapt their behavior voluntarily appear to be limited.¹³⁷

To a great extent the development of these attitudes may have been caused directly by government propaganda which for thirty years has placed greater emphasis of economic growth than on almost any other socio-economic parameter. However, some evidence exists that a significant proportion of Chinese university students are indeed aware of the environmental and energy challenges facing China and are willing to take certain steps in their own lives to address these challenges.¹³⁸

¹³³ Constantin (2007); Hallding et al. (2009).

¹³⁴ Ferris and Zhang (2005); *Economy* (2004, p.91-128); Ma and Ortolano (2000, p.115-131).

¹³⁵ Goodman (1999); Smil, V (2004, p.144); Rosen (2004).

¹³⁶ *Economy* (2004, p. 129-175); Gough (2004); Thompson and Lu (2006).

¹³⁷ Lee (2005).

¹³⁸ Lee (2005); Zweig and Ye (2008).

The wider constraints on energy policy

New ideas cannot easily be translated into new policies. Not only is this process constrained by the older values and beliefs, but the formulation of a realistic new energy policy is constrained by the nature of the energy sector itself and by its links to all aspects of the national economy. As a result, the making of energy policy takes place within a tightly defined framework that rarely allows for sudden and radical shifts; or if such shifts are made, then the costs and risks will be high.

The most immutable aspects of a country's energy sector are the scale, nature and geographic distribution of its primary energy resources. In the case of China, these comprize an abundance of coal resources and only modest oil and gas resources, which mainly lie in the north of the country, far from the current centers of economic activity in the south and east. Though efforts have been made to encourage the diffusion of economic activity to the west and north, for example through the Develop the West Strategy, and to develop new and renewable forms of energy, the country is condemned for the foreseeable future to rely on an essentially inefficient and dirty fuel (coal) and on the need to transport energy over long distances.¹³⁹

Investment in new infrastructure to produce, transform and transport energy has continued at a prodigious and accelerating rate. For example power generation capacity doubled from 357 GW to 713 GW over the period 2002 to 2007, and some 90% of this growth was in coal-fired plants.¹⁴⁰ Investment in rail networks to transport coal, in electricity transmission lines and in oil and gas pipelines has also been massive.¹⁴¹ Though such investment is clearly necessary in order to supply the energy required to support economic growth, the nature of this investment is such that it perpetuates and 'locks in' the country to the existing system of energy supply. Given how much of China's energy infrastructure is relatively new and given that its working life should be on the order of decades, these recent investments provide a tight constraint on future government energy policy.¹⁴²

Likewise, at the other end of the energy supply chain, the nature, the energy properties and the location of new factories and of civil, commercial and residential buildings will play a strong role in determining the scale and nature of energy demand for many years.¹⁴³

¹³⁹ Andrews-Speed (2004); Berrah et al (2007).

¹⁴⁰ Andrews-Speed (2009b).

¹⁴¹ International Energy Agency (2007, p.317-361).

¹⁴² Wang and Watson (2009).

¹⁴³ Rosen and Houser (2007); Andrews-Speed (2009a).

Energy is linked to almost every sector of the economy. The manner and rate in which energy is consumed is dependent on the size, rate of growth and structure of the national economy, and on the state of technology applied in the consumption of energy in the industrial, commercial and household sectors. The manner in which investment is made in energy production and consumption varies according to the way in which finance is made available, for example through banks or directly from the government, and according to the systems for pricing energy products, commodities and manufactured goods. In turn, the pricing of energy is itself linked to the nature of the social welfare systems, for if these systems are not well developed it may be essential to use energy subsidies as an instrument for poverty alleviation. If energy is imported or exported, this energy trade is likely to be supported by actions in the field of diplomacy and security.

As a consequence, energy policy is intimately linked with many other national policies. In the case of China, the desire for a sustained high rate of growth, continuing investment in heavy industry and infrastructure, and the drive to maximize exports have all contributed to the size and structure of demand for energy and constrain the scope for changes in energy policy.¹⁴⁴ The industrial policy of retaining majority state ownership over large energy companies and promoting their internationalization plays an important role in the both the way in which the domestic energy industry is structured and operated, as well as in the manner of overseas investment by these companies.

Chinas' social policies have played a key role in determining the high degree of availability of energy across society, and at relatively low prices for most users. The same attitude to promoting social welfare accounts for the government's keenness to maximize the level of employment in the few remaining large state-owned enterprises, of which the energy companies are key examples. This concern played a significant role in the way in which the oil companies were restructured in 1998. The productive and potentially profitable assets were collected into the commercialized entities which were later listed on international stock markets. The service enterprises were kept in the non-listed, wholly state-owned holding companies. These service companies were able to retain large numbers of employees by continuing their operations within China and by rapidly expanding their activities overseas, both in support of the investments made by the national oil companies and on their own account.¹⁴⁵

Transport policy has a direct relationship to energy policy in any country. In the case of China, the argument for an energy efficient and environmentally friendly transport policy seems to have

¹⁴⁴ Rosen and Houser (2007); Andrews-Speed (2009a).

¹⁴⁵ Andrews-Speed (2004, p. 169-183).

been subsumed beneath an industrial policy which has championed automobile manufacturing, an urban design policy which has favored multilane highways as the main transport network, and a social policy which, intentionally or otherwise, has highlighted car ownership as a legitimate expectation of the urban middle classes.¹⁴⁶ Only belatedly have a small number of Chinese cities started to invest substantially in modern mass transport systems such as metro and light rail. Indeed the abundance of cheap taxis in the cities has created a further class of citizen requiring protection from rising oil prices: the taxi drivers.¹⁴⁷

Energy policy may also be subservient to monetary, exchange rate and fiscal policies. Energy is one of the few items the price of which remains, to a greater or lesser extent, under the control of China's government.¹⁴⁸ Thus in times of rising inflation, such as in 2007 and 2008, the government will tend to use energy prices as an instrument to constrain inflation, holding prices down rather than letting them rise along with international energy prices. China's exchange rate policy has been predicated on the perceived need to maximize exports of manufactured goods and thus the government has artificially restrained the rise of the Yuan against the American dollar by buying dollars.¹⁴⁹ This has had the effect of encouraging the export not only of manufactured goods but also of energy intensive materials such as steel, plate glass and cement. The volume of such exports has been further stimulated by tax rebates.¹⁵⁰ Indeed this policy results in exports accounting for as much as one third of Chinese energy consumption and carbon dioxide emissions.¹⁵¹

Governance structures at central government level

The importance of the energy sector elevates key policy initiatives or decisions to the very apex of power in China's government, as it does in most countries. Here the State Council lies at the top of the government structure. Its membership is very similar to that of the other key institution, the Politburo, which oversees the running of the Communist Party of China.¹⁵² Such was the importance of oil to China in the 1960s and 1970s that members of the 'petroleum clique', who were drawn from the oil industry, played a crucial role in China's

¹⁴⁶ Nolan (2001, p.501-585); Gallagher (2006); World Bank (2007, p.15-20); Parkash (2008, p.33).

¹⁴⁷ Andrews-Speed (2009a).

¹⁴⁸ Andrews-Speed (2004); Andrews-Speed (2009a).

¹⁴⁹ Naughton (2007, p.389); Brammall (2009, p. 371).

¹⁵⁰ Rosen and Houser (2007).

¹⁵¹ Weber et al. (2008).

¹⁵² Lieberthal (1995, p 159-163); Andrews-Speed et al. (2002, p.47).

economic policy-making at that time.¹⁵³ Alongside the State Council and the Politburo, and yet distinctly subordinate, the National People's Congress forms the legislature. Despite the high degree of concentration of power in these bodies, below this level authority over the energy sector is highly diffuse.

China's energy sector has long been characterized by a lack of a strong and well-resourced agency at central government level. During the 1980s and beforehand, each individual energy industry (coal, power, petroleum, petrochemicals) was itself a ministry within government. Each reported to the State Planning Commission (SPC) and the State Council. Other than the SPC, which coordinated all economic activities in the country, no other agency existed to develop a coherent policy for the energy sector. As a result, energy policy consisted mainly of the summation of the individual industry plans.¹⁵⁴

The Ministries for Petroleum and for Petrochemical Industries were abolished in the 1980s, and replaced by two corporations, CNPC and Sinopec respectively.¹⁵⁵ A Ministry of Energy was created in 1988 to oversee these companies and the remaining Ministries for Coal and Electrical Power. But the new Ministry of Energy lacked the status, the authority and the resources to impose itself on the individual industries, and it itself was abolished in 1993.¹⁵⁶

This disaggregated structure persisted through the reforms of 1998. At that time, the Ministries for Coal and Electrical Power were abolished, and replaced by Provincial level coal companies and by a State Power Corporation respectively. The State Economic and Trade Commission (SETC) took responsibility for overseeing the operations of the state-owned energy companies, whilst the newly renamed State Development and Planning Commission (SDPC) retained authority over medium and long-term plans, pricing and energy efficiency.¹⁵⁷

With authority split between these two high level commissions, the degree of coherence in energy policy-making deteriorated rather than increased, not least because of bureaucratic competition. One symptom was the progressive decline of central government control over the energy sector which was highlighted by the energy crisis which faced the new government in 2003.¹⁵⁸

Two key priorities for the government at this time were to regain and centralize control over the energy sector and to provide for more coherent policy making. Three institutions were established in order to achieve these objectives. The Energy Bureau was created

¹⁵³ Liao (2006, p.201-205); Lieberthal and Oksenberg (1988).

¹⁵⁴ Lieberthal and Oksenberg (1988); Andrews-Speed (2004).

¹⁵⁵ Kambara and Howe (2007, p.46, 97).

¹⁵⁶ Andrews-Speed (2004); Downs (2006).

¹⁵⁷ Andrews-Speed (2004).

¹⁵⁸ Downs (2006); Meidan et al (2009).

within the National Development and Reform Commission (NDRC) which replaced the SDPC in March 2003. This brought together many, but not all, of the energy functions which had been scattered across the previous SDPC and SETC, the latter having now been abolished. The functions of the Energy Bureau included formulating policy and drawing up plans for sector reform, as well as routine oversight of the country's energy sector.¹⁵⁹ It soon became clear that this small bureau with a staff of less than thirty could not possibly fulfil its mandate. Two years later, in 2005, the government set up an Energy Leading Group within the State Council, supported by a State Energy Office. Their role was to set strategic directions and to improve policy coordination.¹⁶⁰

The ten years of government restructuring since the mid-1990s, rather than improving governance, had led to a progressive loss of control by central government and a decline in the quality of governance within the energy sector.¹⁶¹ In the build-up to the plenary session of the National People's Congress in March 2008, it was anticipated that a new and powerful energy agency would be established. This did not happen. Instead the reforms to those agencies managing the energy sector were rather modest in comparison with reforms to other parts of government. The existing Energy Bureau was renamed the National Energy Administration, and a National Energy Commission was created from the pre-existing National Energy Leading Group.¹⁶²

The National Energy Commission retained the overall roles of coordinating energy policy and setting strategic direction that were previously held by the Leading Group. Meanwhile the National Energy Administration took on the functions of the former Office of the Energy Leading Group, the NDRC's Energy Bureau and Department for Energy Efficiency, and the former China Commission of Science, Technology and Industry for National Defense (COSTIND). Its functions were to develop energy strategy, to draft plans and policies, to make proposals for energy industry reform, to oversee the country's oil, natural gas, coal and power industries, to manage the strategic oil reserves, to formulate policies for renewable energy and energy conservation, and to carry out international energy cooperation. The responsibility for energy pricing remained with the NDRC's Department of Price Administration. The level of staffing was set initially at one hundred and twelve.¹⁶³

Other government agencies at or close to ministerial level also continued to have a significant role to play in the energy sector. The Ministry of Land and Resources continued to manage resource

¹⁵⁹ Downs (2006).

¹⁶⁰ Downs (2006); Rosen and Houser (2007).

¹⁶¹ Kong (2006).

¹⁶² Chen and Graham-Harrison (2008); Zheng and Wang (2008).

¹⁶³ Wang (2008); Downs (2008).

extraction and exploitation, and the environmental protection of the land. The State Environmental Protection Agency, recently elevated to ministerial status as the Ministry for Environmental Protection was responsible for controlling the pollution of air and water. The State Asset Supervision and Administration Commission took the ownership role for government over the large state-owned enterprises. In addition the Ministry of Science and Technology, the Ministry of Commerce, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Transport, the Ministry of Railways and the Ministry of Housing and Urban-Rural Development, all retained roles in the energy sector.¹⁶⁴

Each ministerial organization has the authority to issue regulations relating to its sphere of activity. Of these the most powerful in the energy sector is the NDRC which, as the successor of the State Planning Commission, has nation-wide and sector-wide responsibility. Above all these ministerial organizations sit the three key bodies in which the top leadership of the country are represented, as described above: the State Council, the Politburo and the National People's Congress. The Military also have a role to play in energy policy formulation, but this is probably rather limited.¹⁶⁵

The main consequence of the last twenty years of restructuring is that the country still lacks a well-staffed and authoritative agency with overall responsibility for the making and implementation of energy policy.

Energy policy-making

The fragmented nature of the governance structures in the central government combined with other features of economic policy-making described above contribute to a number of weaknesses in China's energy policy-making, for example: a lack of leadership over the energy sector; the disproportionately high degree of influence over policy-making held by state-owned energy companies; a delight in the use of ambitious targets; and the prevalence of bargaining in policy-making which results in policy outputs which may be unsuited to the challenges they are intended to address.

As described above, China's energy sector has consistently lacked a well-staffed and authoritative agency to formulate and implement energy policy, and to provide overall leadership of the energy sector. Instead the structure of government led to policy proposals related to energy arising from individual line ministries or, latterly, state enterprises. These individual entities would champion

¹⁶⁴ Meidan et al (2009).

¹⁶⁵ Andrews-Speed et al. (2002, p.49); Downs (2004).

their own proposals which might take the form of targets for five-year plans, laws and regulations covering their specific activities or ideas for industry restructuring or price reform. In cases where these policy proposals were limited to the specific industry or activity, then the proposal might be accepted and implemented with little obstruction from other parties. In this way energy policy and plans for the energy sector tended to resemble a summation of individual industry strategies and targets which together may be inconsistent or even contradictory, rather than a coherent package of policies designed to address the wider energy, economic and environmental challenges facing the country.¹⁶⁶ The restructuring of government agencies in 2008 does not appear to be sufficiently profound to effect any great change in these patterns.¹⁶⁷

The prime examples of this fragmented policy environment are the five-year plans for energy which continue to be characterized by specific targets for each component of the energy industry, but by only vague statements relating to measures and mechanisms which would apply across the energy sector and provide some coherence. Formal laws and regulations show the same features.¹⁶⁸ Laws and regulations applying to a single activity, such as township and village coal mines, emanate from a number of different sources and tend to be inconsistent and contradictory.¹⁶⁹

Disjointed policy is also exhibited by the contrasting approaches to pricing for crude oil and coal, on the one hand, and for electricity supply and oil products, on the other hand. These fundamental pricing discontinuities continue to cause major difficulties in a progressively commercialized energy sector.¹⁷⁰ Indeed, these discontinuities are an important source of instability in China's domestic energy markets. Not only is such instability typical of what transaction cost economics would consider to be a hybrid governance structure, that is to say a mix of government control and the market, but these discontinuities become sources of 'friction' which should trigger policy change.¹⁷¹ But to date the government has failed to take steps to eliminate these discontinuities.

The period of restructuring of the energy industry in the mid and late 1990s saw a number of occasions in which the newly commercialized state energy enterprises were able to influence government policy to their direct advantage. In both the coal and oil industries, the interests of the major state-owned enterprises were potentially threatened by smaller enterprises. In the coal sector, the large mines, in which the state had invested billions of Yuan, were

¹⁶⁶ Andrews-Speed (2004); Kong (2006); Downs (2006).

¹⁶⁷ Downs (2008).

¹⁶⁸ Andrews-Speed (2004).

¹⁶⁹ Andrews-Speed (2004).

¹⁷⁰ Kong (2006); Wang (2007); Andrews-Speed (2008a).

¹⁷¹ Williamson (2000); Lieberman (2002).

threatened by the township and village coal mines in 1998. At that time, demand for coal exceeded supply and the smaller mines with their lower operational standards and lower costs were able undercut the larger mines in the market. The ensuing campaign to close the township and village mines was ostensibly driven by concerns for safety and the environment, but the timing of the campaign was decided by the short-term need to protect the interests of the larger mines.¹⁷² Thus when demand picked up again, output from the smaller mines was allowed to grow again, until a further campaign to close them was launched in 2004.¹⁷³

In a similar manner, the restructuring of the petroleum industry in 1998, far from leading to an enhancement of competition, resulted in the further consolidation of the market position of the newly commercialized companies, PetroChina and Sinopec, as the government enforced their take-over of a large number of local wholesalers and retailers in the late 1990s.¹⁷⁴ Since that time the national oil companies (NOCs) have extended their influence over petroleum policy from the domestic into the international sphere for it can be convincingly argued that it is the NOCs which drive the China's international energy agenda rather than the government.¹⁷⁵ In the electricity sector, the dominant state-owned companies have also been successful in maintaining high barriers to new market entrants in as part of a strategy to maximize their financial returns.¹⁷⁶

This fragmentation of policy was further aggravated by the tendency of the top leadership to issue edicts or launch campaigns directed at a specific activity or industry, without apparent consideration for the wider or longer-term consequences or requirements of these policy actions. Two recent examples concern the construction of power stations and of the West-to-East gas pipeline. The year 1998, as mentioned above, was characterized by an oversupply of energy, and this affected the electrical power industry. Partly in response to this, the central government banned the construction of large new power stations from 1999 in order to prevent over investment and a waste of resources. This edict lay created the background for the nationwide power shortages which emerged from 2003 once economic growth picked up again and which lasted through 2008.¹⁷⁷

The decision to build the West-to-East gas pipeline from Xinjiang to Shanghai was made in a relatively short period in 2001. The decision was driven by the wider Develop the West programme which was being formulated in order to enhance the economic

¹⁷² Andrews-Speed (2004).

¹⁷³ Andrews-Speed (2007).

¹⁷⁴ Ma (2008).

¹⁷⁵ Ma and Andrews-Speed (2006); Downs (2006); Houser (2008); Kong (2009).

¹⁷⁶ Cheng and Tsai (2009).

¹⁷⁷ Kong (2006); Andrews-Speed (2009b).

development of western China and by the recent discovery of significant gas reserves. Though the decision to press ahead with construction of the pipeline may have been justifiable in this context, it was made in the absence of a wider policy for natural gas.¹⁷⁸ Indeed such a policy was only formulated and published in 2007.¹⁷⁹ Investors in the pipeline and in gas-using infrastructure had no policy framework to guide their investments. As a consequence, all the foreign companies invited to participate in the pipeline project withdrew, and, at the other end of the supply chain, gas-fired power stations were built by Chinese energy companies which, even in 2008, were receiving no gas supply.

Further, as a relic of the Mao era, individual industries in the past appeared to revel in setting themselves extremely ambitious targets and deadlines, most of which were quite unachievable. For example, in the late 1970s the government set long-term production targets for the oil and coal industries for the year 2000 of 200 million tonnes and 2,000 million tonnes, representing a doubling and trebling of output respectively.¹⁸⁰ The target for oil was missed by a long way, but thanks to soaring demand and massive investment, the coal target was met in 2005. Recent commercialization has dampened this tendency for setting ambitious targets for individual industries. However the government in 2004 was bold enough to set the objective of reducing energy intensity by 20% between 2006 and 2010. This target may be achieved, but it will have taken enormous effort on the part of the central government, and it is far from certain that this success can be sustained.¹⁸¹

In the case where initiatives had wider ramifications, the policy proposals would be subject to bargaining between the various parties and would tend to result in final policies which resulted from a consensus. In such consensus building, a single entity could protect its interests by vetoing a proposal which threatened its vital interests, and thus reform measures intended to produce radical change would be substantially diluted or even stalled completely.

Whilst internal debate and bargaining are characteristics of government decision-making in most political regimes, the structure and nature of China's energy sector has granted considerable bargaining and veto power to the individual ministries and state enterprises.¹⁸² In recent years, efforts to make substantial changes to the energy sector have foundered, with the end result variously being a compromise, a step of little significance, or a further postponement of the decision. Examples are numerous, and all relate to key aspects of the energy sector.

¹⁷⁸ Andrews-Speed (2004).

¹⁷⁹ National Development Reform Commission (2007).

¹⁸⁰ Smil (1981); Kambara and Howe (2007, p.33).

¹⁸¹ Andrews-Speed (2009a).

¹⁸² Constantin (2007).

The 1998 reforms to the petroleum industry were initially intended to create five or more oil companies which would compete with each other in the domestic market, in the same way as the State Power Corporation was later broken up in 2002. Instead, CNPC and Sinopec just underwent an asset swap and retained their de-facto duopoly over the domestic markets.¹⁸³

The introduction of a consumer tax, or rather a significant increase of existing taxes on oil products such as gasoline and diesel has been debated in the National People's Congress since the early 1990s. The aims of the tax were said to be to encourage energy saving, to promote stability in the oil sector, and to assist economic reform. The move was consistently blocked by delegates of the National People's Congress concerned for the impact of this tax on the poorer members of Chinese society. Fuel tax was eventually increased on 1st January 2009, at a time which allowed the government to take advantage of a relatively low level of international oil prices.¹⁸⁴

A final example concerns the draft Energy Law. The idea of creating an Energy Law came firmly on to the government agenda in 2005 as part of the leadership's drive to constrain energy use and improve the management of the energy sector. Four years later, in 2009, the law is still under discussion. The draft itself covers all conceivable aspects of energy production and consumption. It is so ambiguous or self-contradictory on the key points, such as ownership, pricing and access to infrastructure, that it would not appear to be of much value as a tool for charting the future development of the energy sector. The end result of extensive bargaining and compromise is likely to be a document which fails to achieve its intended objective of providing a clear framework for the future development of the nation's energy sector.¹⁸⁵

Policy implementation

The implementation of a policy can fail for a number of reasons: the concept behind policy itself may be inappropriate or misguided, and, in particular, it may fail to take into account other major policies or certain circumstances which lie in contradiction to the new policy; the details of the policy may have been inadequately thought through before implementation; the consultation during policy-making may have been insufficient to win the support of all key parties; the systems and resources to support policy implementation may be inadequate; or circumstances may change to render the new policy irrelevant.¹⁸⁶

¹⁸³ Andrews-Speed (2004).

¹⁸⁴ Wang (1999, p.12, 223); Downs (2006); Andrews-Speed (2009c).

¹⁸⁵ Andrews-Speed (2008b); Kong (2009).

¹⁸⁶ Hogwood and Gunn(1984); Parsons (1995).

Energy policy in China suffers from various combinations of these deficiencies. The most prominent derives from active resistance from local governments. This resistance has two sources. First, local governments, even Provincial governments, are generally not formally involved in the formulation of national policy, or only marginally. They may push for national policy changes or they may be recipients of national policy, but except if the policy goes through the National People's Congress, representatives from lower levels of government do not formally draft national laws and policies nor do they have the chance to debate them in an open forum. Second, in the case of energy, natural resources and the environment, the interests of local governments are often diametrically opposed to policy initiatives from the central government. The latter seek the effect long-term management of energy, natural resources and the environment, whilst the local governments tend to be focused on short-term economic growth. The implementation of national policy is further constrained by the fact that the local bureaux of the Ministries report to and are paid by the local governments and not by the central government.¹⁸⁷

Poor implementation at local level is enhanced by the involvement of local officials in the very businesses they should be regulating, by a shortage of trained staff in certain areas, by the low level of penalties for certain offenses and by rent-seeking and corruption. Further, the immaturity of the legal system has the effect of protecting local state-owned enterprises, local governments and even local private businessmen from prosecution by private parties. These obstacles to policy implementation are exacerbated by the clientilism, *guanxi* and networks which characterize parts of China's economy.

As a result, any measures introduced by the central government which have the effect of reducing local economic activity, will be resisted by local governments and enterprises unless the central government employs what would appear to be disproportionate degree of effort to enforce the new measures, in the form of a campaign.

Nowhere is this better illustrated in the energy sector than by the repeated campaigns to close the township and village coal mines. In the mid-1990s these mines produced almost half of the country's requirement for coal and contributed greatly to local wealth creation in the mining areas, but were characterized by very poor safety and environmental practices. Efforts by the central government to close many of these mines between 1998 and 2002 were met with active resistance, false reporting and feigned compliance. As a consequence the government has run on a more rigorous closure campaign since 2005. Though this has met with considerable success, the same local obstacles continue to arise.¹⁸⁸

¹⁸⁷ Economy (2004); Ma and Ortolano (2000); Andrews-Speed (2004).

¹⁸⁸ Andrews-Speed (2004); Andrews-Speed and Ma (2008); Wright (2009).

Environmental protection remains a longstanding problem in China, not least in the energy sector. Despite extensive environmental legislation and despite the progressive upgrading of the status and staff of the Environmental Protection Agency to a Ministry, a lack of regulatory resource and authority, weak penalties and local resistance continue to ensure that China has some of the world's most polluted skies and rivers.¹⁸⁹

When the Energy Conservation Law was introduced in 1997, it had almost no impact. A few provinces passed local regulations which were just slightly modified from the national law, but little effort was expended in enforcement.¹⁹⁰ The current nationwide programme to enhance energy efficiency appears to have succeeded in overcoming obstruction at Provincial level, but is still meeting resistance from lower levels of government and state-owned enterprise.¹⁹¹

The drive to achieve ambitious targets may also have undesirable side-effects in the form of inefficiencies, as has been seen recently in the case of wind power. At the end of 2005, total installed wind power capacity was about 1 Gigawatt (GW). Since then the rate of growth has been dramatic. Total capacity reached 12 GW by the end of 2008 and is set to reach 20 GW by the end of 2009. During 2009, China's wind power capacity took it to fourth in the world, behind the USA, Germany and Spain. In 2007 the target set for the year 2020 was 30 GW. The target for 2020 currently (late 2009) stands at 100 GW and might be raised yet again. Two undesirable side-effects of this target-driven culture have been overcapacity in the manufacturing of components as companies seek to expand their market share and a low average generation rate of just 20% for wind farms. This low rate is a consequence of poor siting, unreliable technology and unwillingness of grid companies to despatch the power. In addition, many wind farms experience long delays to be connected to the grid.¹⁹²

That being said, it would be incorrect to assume that all policy initiatives in the field of energy are doomed to fail or to generate undesirable side-effects. This is clearly not the case. One important reason, as discussed above, is the authority of the Communist Party. The Party is all pervasive, at all levels of government, in state-owned enterprises and also in the private sector. The Party is the glue which holds the fragmented system together, along with networks of relationships between individual officials and managers.¹⁹³ The importance of the Party and of loyalty to national interests is best illustrated by the career progress of officials both in government and

¹⁸⁹ Economy (2004); Ma and Ortolano (2000); Andrews-Speed (2004).

¹⁹⁰ Andrews-Speed (2004).

¹⁹¹ Andrews-Speed (2009a).

¹⁹² McElroy et al. (2009).

¹⁹³ Lieberthal and Oksenberg (1988, p.151-160); Lieberthal (1995, p.208-214).

in state-owned enterprises. Successful and loyal officials at lower levels of government are promoted to higher levels of government. Thus the top leadership has tended to be drawn from those who were previously governors or Party Secretary Generals of Provinces or Mayors of major municipalities such as Beijing, Shanghai and Tianjin.¹⁹⁴

Although the most senior leaders tend to emerge from a career in the Party apparatus, in the Ministries or in Provincial-level government, a number of senior officials from the state owned energy enterprises have also been promoted to high government positions. Before he became Prime Minister in 1987, Li Peng had been Minister for Electrical Power. More recently Zhou Yongkang moved from his position as President of CNPC to be Minister for Land and Resources, then Party Secretary General of Sichuan Province and later Minister for Public Security. Mr Zhou is currently, in 2009, on the Politburo Standing Committee, is a State Councillor and is Chairman of the Party Central Political Legislative Committee.¹⁹⁵

The prospects for promotion to the highest level from all streams of government and state enterprise combined with the essential requirement to be a Party member to rise through the ranks, ensures that policies critical to the survival of the Party and to the security of the state are likely to be implemented with at least some degree of success. It is because inadequate energy supply is now seen as a serious threat to the economic interests of the country and therefore to the interests of the Party that the government is expending so much effort in implementing the new energy efficiency policies. It is thus to be expected that many government officials who have long-term political ambitions will indeed seek to implement China's emerging energy policies.

¹⁹⁴ Lieberthal (1995, p.226-230).

¹⁹⁵ National Congress of the Communist Party of China (2007, p.217-219).

Implications for China's energy policy

This chapter has examined how decisions, actions and behaviors in China's energy sector are driven and constrained by critical variables such as the embedded institutions, the institutional environment, the central role of the energy sector, and new ideas. This analysis has demonstrated that the context in which policy is formulated and the processes of policy making and implementation in China result in the overall national energy policy being characterized by, on the one hand, continuity and path dependency and, on the other hand, by incremental, short-term adjustments which are often unpredictable in nature and in their consequences.

In the absence of a major economic or political crisis and in the absence of intense and sustained political effort on the part of the government, a sudden and fundamental change in the manner in which the energy sector is managed is most unlikely. Indeed, the same can be said of all industrialized or industrializing countries. Thus the paths of China's energy policy and energy consumption over the coming two decades are relatively predictable within certain bounds, and the most important determinants will be the scale and nature of economic growth. Despite the short-term success of the measures to enhance energy efficiency and to enhance the role of renewable energy, achieving significant and sustained impact will require major adjustments to many components of the economy and to the political structures. Setting aside the possibility of major domestic crises, it is to be expected that China's demand for energy will continue to grow, albeit at a rate which gradually declines.

Set against this path-dependency is a tendency for sudden minor changes in policy priorities, objectives and instruments. Many measures are short-term in focus, are reactive in character and are liable to rapid reversal or modification. These features, combined with the difficulties associated with policy implementation, render the path of China's energy policy and the outcomes highly unpredictable in the short-term. Further, any unwillingness on the part of the government to keep energy policy at or near the top of the agenda for sustained periods of time will render even the long-term impact of major policy initiatives uncertain. This has consequences both for those observing energy phenomena within China, as well as those engaged with the China's activities overseas.

In addition, the rapid and sustained growth in China's energy demand taking place in such a policy environment creates and sustains a number of fundamental tensions and contradictions within the energy sector. For example, the problem of keeping up with the rate of growth of demand and trying to keep each link in the energy supply chain expanding rapidly at the same pace and in a coordinated manner distracts policy makers from longer-term considerations. Secondly, policy proposals generally fail to address in a satisfactory and sustainable way how the fundamental tensions between the requirements of security of supply will be reconciled with those of social equity, those of economic competitiveness and efficiency, and those of environmental protection.

From the international perspective, China's greatest energy policy challenge is to put in place measures which can dramatically constrain and eventually reduce the total level of carbon emissions from its energy sector. A range of pathways has been described recently to show, in principle, how China can achieve levels of emissions by the end of this century which are consistent with global target. Each pathway depends on different combinations of structures for the economy and for energy supply, and on the application of different economic and policy instruments.¹⁹⁶ Although the introduction of new technologies will undoubtedly have a key role to play in the success of climate change strategies, the analysis presented in this chapter identifies and elaborates a number of features of China's society, economy and polity which may constrain the implementation of these plans.

The path-dependency of and internal inconsistencies within China's energy policies and institutions are not unique, neither is the failure to react to new challenges in a coherent and sustained manner. The energy crises of the 1970s may have succeeded in persuading the governments and societies of OECD countries to radically adapt their energy consumption patterns over just a few years, but many initiatives were reversed after energy prices fell in the mid-1990s.¹⁹⁷

In recent years, almost without exception, OECD governments have been very slow to adapt their energy policies to address the twin challenges of security of energy supply and climate change. The complexity of the challenges, the costs of policy implementation and an unwillingness to move ahead of the pack have combined to produce a collective paralysis.¹⁹⁸

That being said, the path of China's energy policy has more impact on the rest of the world than any other country, with the

¹⁹⁶ See, for example: Tao and Watson (2009); International Energy Agency (2009); Hallding et al. (2009); Oberheitmann and Sternfeld (2009).

¹⁹⁷ International Energy Agency (2006, p.24-25).

¹⁹⁸ Helm (2007).

exception of the USA. This arises from the scale of its energy sector and of its national oil companies, from the sudden short-term changes in energy and economic policy, and also from the lack of transparency in the policy-making process. These features of scale and unpredictability are exacerbated by distinct set of ideas, beliefs and traditions that frame the policy-making process.

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