China Environmental Science & Sustainability (CESS)
UBC-Research Group

Working Paper #1

Challenges for Effective Policy Implementation toward a Sustainable Coal Sector in China

Case Study:
The Closure Policy of Township and Village Coal Mines (TVCMs)

Esteli Reyes
Master of Arts-Asia Pacific Policy Studies
Institute of Asian Research
University of British Columbia
Tel: 604-779-6400
esteli@interchange.ubc.ca

June 2007, Vancouver B.C.

INDEX

1. Introduction

China in the last years has experienced rapid economic growth and an equally rapid increase in energy use. As a result, environmental degradation by energy use has augmented, especially in its urban areas. When this fact is coupled with China's requirements for further economic expansion to meet the growing needs of its population, it is clear that the country faces great challenges in balancing its goals of economic growth with energy efficiency and environmental sustainability.

The exploitation and use of coal is one of China's major sources of atmospheric and water pollution. Therefore, a fundamental tension exists between energy efficiency and environmental aspirations in one hand, and the imperative of economic growth and the reality of huge domestic coal reserves on the other. Since 1997 the Chinese government has openly encouraged a reduction in the role of coal in its energy sector. Government energy officials have been traveling around the world to secure shares in foreign oil developments and to negotiate import agreements. Plans for the construction of domestic ports equipped to handle and refine oil, natural gas, and liquefied natural gas are in progress.

Furthermore, as part of this strategy at the national level in June 1998 the production target for the year of coal was reduced by 70 million, later in August it was announced that 22, 000 mines without licenses would be closed by 2000 so as to reduce output by the 200 millions tons necessary to bring down supply closer to demand. Recently, in February 2006, China's National Development and Reform Commission (NDRC) revealed a plan to restructure China's coal sector and reduce the fragmentation in the industry. The goal is to

establish five to six giant conglomerates in China's main coal producing provinces, and close down all small coal mines, also known as township village coal mines (TVCMs) by 2015.[1]

However, even when the government has revealed the intention to reduce the role of coal in its energy sector due to sustainable objectives, the available projections suggest that domestic demand for coal will increase by 50-100 % between 2002 and 2020. It means that coal will continue to dominate China's primary energy consumption, despite its progressive substitution by other fuels.

In this same direction, the closure policy of TVCMs until the date has not been successfully implemented. Recently, Chinese government inspections found that many local government officials had not bothered to enforce the closure order and did not have any measures in place to prevent TVCMs from opening again.[2] Additionally, since the deficiencies and complexities in the institutional framework and regulation for the TVCMs continue - which also affects the environmental regulation- it has been difficult to make an effective policy implementation towards the coal sector on the ground.

From this perspective, there is an evident gap between Chinese leader's aspirations for environmental sustainability and the real job done within the coal sector towards this purpose. Therefore, key questions for this paper are: Does China really want to do

[1] China's coal industry has traditionally been extended among large state owned coal mines, local state-owned coal mines and thousands of town and village coal mines. More detail in this paper at: "The growth of township and village coal mine sector". Source: International Energy Agency (2006) *"China's Power Sector Reforms, where to next"* OECD/IEA: 33-63.

[2] The inspection team visited Northwest China's Shanxi Province; they found that provincial officials had only shut down about half of the small mines that should have been closed last year (2006). The province had targeted 80 mines for closure last year, but only managed to follow through on 44 of them. The crackdown targets are mines with an annual production capacity of less than 30,000 tons. Such mines are to be either shut down or merged to form bigger ones. Source: Ying, Gao. "Many Mines flouting crackdown". *China Daily*. Available at: www.chinaview.cn

something about its dependency on coal and the environmental issue? Why is it hard to make an effective policy towards the coal industry? What are the challenges?

In the current paper I approach the challenges for effective policy implementation toward the coal sector and its environmental impact. My framework of analysis is the closure policy of TVCMs in 1998. Here, I argue that central government goals for administrative reform towards a more sustainable coal sector have failed during the process of policy implementation by the influence of Chinese local government officials who stand to lose with the reform outcomes, and by the complexities and deficiencies in the Chinese institutional structure and regulatory framework of the sector.

The objectives are twofold: 1) to indicate that the environment has to be treated as a regulatory challenged for individual industries such as coal; and 2) to point out that in order to promote a sustainable coal sector, it is necessary an effective policy implementation for TVCMs; which requires to raise the commitment and environmental awareness of government's officials; and a better institutional and regulatory framework for TVCMs.

In order to explore these objectives: First, I will present an overview of China's energy sector, its current and future statistics. Second, I will illustrate the environmental impact of the energy sector, with special emphasis on the damage caused by the TVCMs. Third, I will expose the Chinese central government's inability to eliminate many of townships and village coal mines (TVCMs), which is associated with layers of government bureaucracies. I conclude with reflections on what I have deduced from my research.

2. China's Energy Sector: Energy Data, Future Statistics and Analysis

2.1 China's Recent Energy Supply and Demand

China's economic growth and industrialization has required an exceptional increase in energy supply. Since 1980 the annual consumption of commercial energy has risen by approximately 250 per cent (Figure 2.1), which has provided the government with a major policy challenge. It responded by introducing measures to raise the output of coal, the most readily accessible form of primary energy in the country.

China has the world's third largest reserves of coal and has been the largest producer of coal since 1991 when it overtook the USA. From 1980 to 1990 the contribution of coal to China's energy sector rose from 72 per cent to 76 per cent before falling sharply in the late 1990s.[3] (Table 2.1) At the same time the government invested heavily in hydro electricity and to a lesser extent in nuclear power. The output of crude oil and natural gas also rose, but their share of energy consumption only started to increase significantly in the late 1990's.

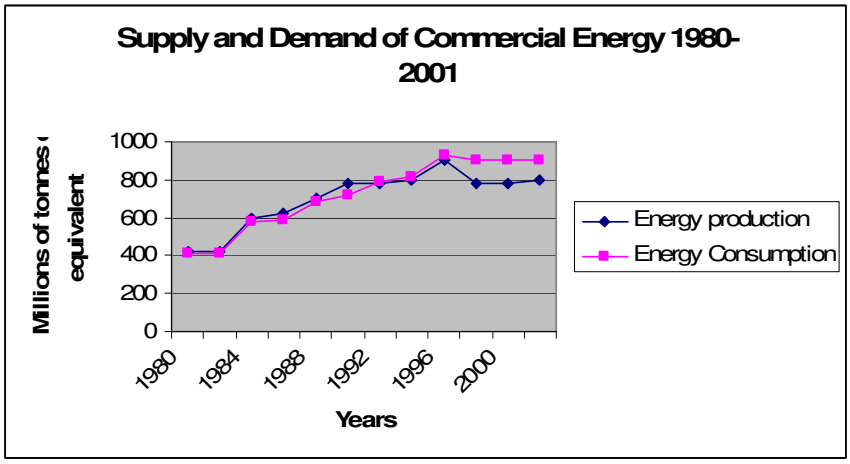
Supply and demand for primary energy stayed almost in balance until the mid 1990s when demand began to exceed supply. The gyration of the production curve from the late 1990's (Figure 2.1) reflects a combination of government policy and unreliable statistics, relating in both cases primarily to coal production. The ability of China to provide for most of its own energy requirements from domestic sources has depended as much on increasing the efficiency of energy use as on producing more energy.

[3] World Coal Institute (2006) "Coal –Providing Secure Energy" *Coal: Secure Energy*. Available at: www.worldcoal.org

Though still high by the standards of developing countries, China's energy intensity has declined during the last twenty years.[4] The reasons that have contributed to the reduction of energy intensity are: First of all that the structure of the economy has changed; the role of the service sector has grown, at the same time the balance between heavy and light industry is generally shifting toward light industry; and second, the government has introduced measures to increase the efficiency of energy end-use.[5]

The middle and late 1990 saw two dramatic changes in the balance of energy supply and demand. The first change occurred in 1993: China's consumption of oil exceed its domestic production for the first time. China went from exporter to importer. The level of net imports has steadily increased since then. (Figure 2.2) The second interruption occurred in 1998 and 1999 when energy consumption in China fell for two successive years. (Figure 2.1) This fall in energy demand is best explained by a combination of general economic slowdown related to the Asian Crisis, a decline in output from energy-intensive industries, closures of inefficient state factories and a general increase of end-use efficiency.

Figure 2.1

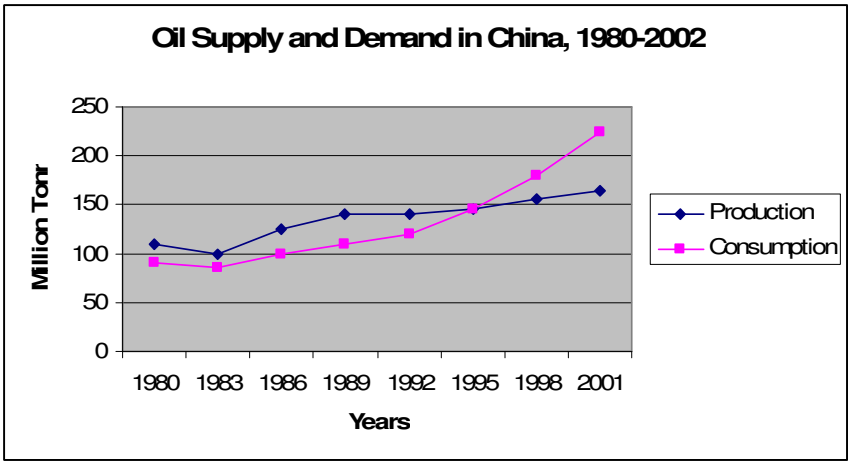


[4] Sinton, J.E. and Fridley D.G. (2000) "What Goes Up: Recent Trends in China's Energy Consumption", *Energy Policy* (28): 671-687
[5] Sinton, J.E. Supra note 4.

Table 2.1 Structure of primary energy consumption, 1980-2001

	1980	1985	1990	1995	1999	2001
Coal	72.20%	75.80%	76.20%	74.60%	66.10%	67.70%
Oil	20.70%	17.10%	16.60%	17.50%	23.20%	23.60%
Natural Gas	3.10%	2.20%	2.10%	1.80%	2.20%	2.50%
Hydro-electricity	4.00%	5.10%	5.10%	6.10%	6.60%	6.90%

Figure 2.2



2.2 China's Future Energy Demand

Most projections foresee that China's primary energy consumption increases by at least 200 per cent during the twenty years from 2001 to 2020.[6] The lower estimate is related to low levels of economic growth and energy efficient strategies. The higher estimates envisage faster economic growth and a more business-as usual energy approach to energy efficiency.

[6] Gao, Shixian. (2000) China, in P.B. Stares (ed), *Rethinking Energy Security in Asia*. Tokyo: Japan. Center for International Exchange.

Recent trends and analyses suggest that the coming twenty years will see a rise in proportion of oil and gas consumption and the use of renewables at the expense of coal. By the year 2020 coal is likely to account for about 60% of China's primary energy consumption, down from the current level of 65-67 per cent, and way below its peak of 76 per cent in 1990.[7] (See Table 2.1) However, coal will continue to dominate China's primary energy consumption, despite its progressive substitution by other fuels. The limited ranges of available projections suggest that domestic demand for coal will increase by 50-100 per cent between 2002 and 2020. (See Table 2.2)

Table. 2.2. Projections of future coal demand in million tonnes.

	2002	2005	2010	2015	2020
IEA, 2006		1,269-1,516	1,449-2,005	1,582-2,541	1,710-3,156
GAO,2000			1,400-1,450	1,805-1,876	

Key determinants of the absolute level of coal consumption in China over the next twenty to thirty years will include:

- the rate of economic growth and the structure of the economy;
- the rate at which investment can be made in the develop of new large-scale coal mines and in infrastructure to transport coal to domestic markets and to ports for export;
- the constraints on the import of foreign coal to coastal provinces;
- the future effectiveness of energy efficiency and energy conservation policies, particularly in the industrial and residential sectors;

[7] Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.

- the speed at which environmental policies can drive through the substitution of coal by natural gas and hydro-electricity;
- the speed at which central policies- such as the closure policy of TVCMs- can be effectively implemented at the local level.

The exploitation and use of coal is one of China's major sources of atmospheric and water pollution, as is discussed below. Therefore, a fundamental tension exists between energy efficiency and the imperative of economic growth, which is supported by the reality of huge domestic of coal reserves in the territory.

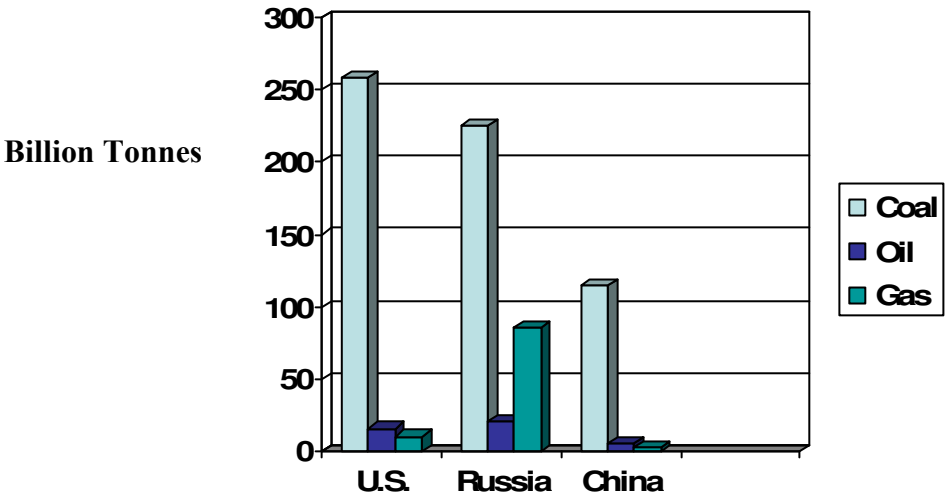
2.3 China's Future Energy Production

Regardless of origin, all forecasts, scenarios and plans concerning energy production in China point to decades more of coal's dominance. A major energy strategy study released in 2004 is typical finding that, under varying assumptions, coal may account for between 59 per cent and 70 per cent generation capacity in 2020.[8]

Coal together with electricity generated from both coal-fired power stations will continue to provide the vertebrae of China's energy sector for the foreseeable future. With more than 114 billion tonnes (See Table 2.3) the country has the third largest reserves of coal in the world after the USA and Russia.[9]

[8] China Energy Development Strategy and Policy Research Group, 2004, quoted by: International Energy Agency (2006). Supra note 1.
[9] World Coal Institute. Supra note 3.

Table 2.3 Location of the World's Main Fossil Fuel Reserves



Source: World Coal Institute 2006

Provided investment in new coal production capacity is forthcoming, domestic production should keep pace with forecast demand and rise at least by 50 per cent by 2020. (See Table 2.2). As the economy continues to grow and modernise the rate of growth of power generating capacity and of electricity, demand will continue to rise sharply, possibly doubling in the coming years to 2020. The share of hydro-electricity in China's power generation is set to rise during the coming years, especially when the Three-Gorges dam is commissioned in the year 2009. During the following years it is hoped that hydro-electricity will account for up to 20-22 per cent of power generation, up from 18 per cent in the 1990s.[10]

On the other hand, China's proven recoverable reserves of oil and gas (See Table 2.3) are modest by international standards, amounting just 6 and 3 billion tonnes respectively.[11] However this apparent similarity between oil and gas covers a fundamental difference. Most of the oil-bearing basins in China are well-explored and the largest oil

[10] International Energy Agency (2006).Supra note 1.
[11] World Coal Institute. Supra note 3.

fields have been producing for thirty years or more, while systematic exploration for natural gas in China only started in the mid 1990s. This means that China's remaining reserves of oil downwards and of gas upwards.

Therefore, since coal reserves are significantly more abundant and much more widely and evenly dispersed than any other fossil fuels, coal is and will remain as the main energy resource in the country, and as the largest emitter, by far, of some of the most important airborne pollutants in China.

3. The Environment

"Energy policy and environmental policy are, or should be intimately entwined in any country, especially in the rapidly growing economies of South and East Asia".[12] In the case of China, the impact of the energy sector on the environment is exacerbated by the high proportion of coal in the primary energy consumption mix, the relative backwardness of much energy production, conversion and energy using technology, and the rapid growth of road transport. Indeed the energy sector is arguably the major contributor to environmental damage in China.[13]

Local pollutants include sulphur dioxide, nitrogen oxides and suspended particulates. The main source is coal used by industry and households, with vehicle emissions and natural dust being subordinate contributors. Levels of these pollutants in many Chinese cities are well above the maximum levels recommended by the World

[12] Brandon, C. and R. Ramankutty (1993) *Towards and Environmental Strategy for Asia,* Discussion Paper No.224. Washington D.C: World Bank.
[13] World Bank (2001) *China, Air, Land and Water. Environmental Priorities for a New Millennium..* Washington D.C: World Bank.

Health Organization and place the air in some of the cities among the most polluted in the world, especially in winter when coal burning reaches a peak.[14]

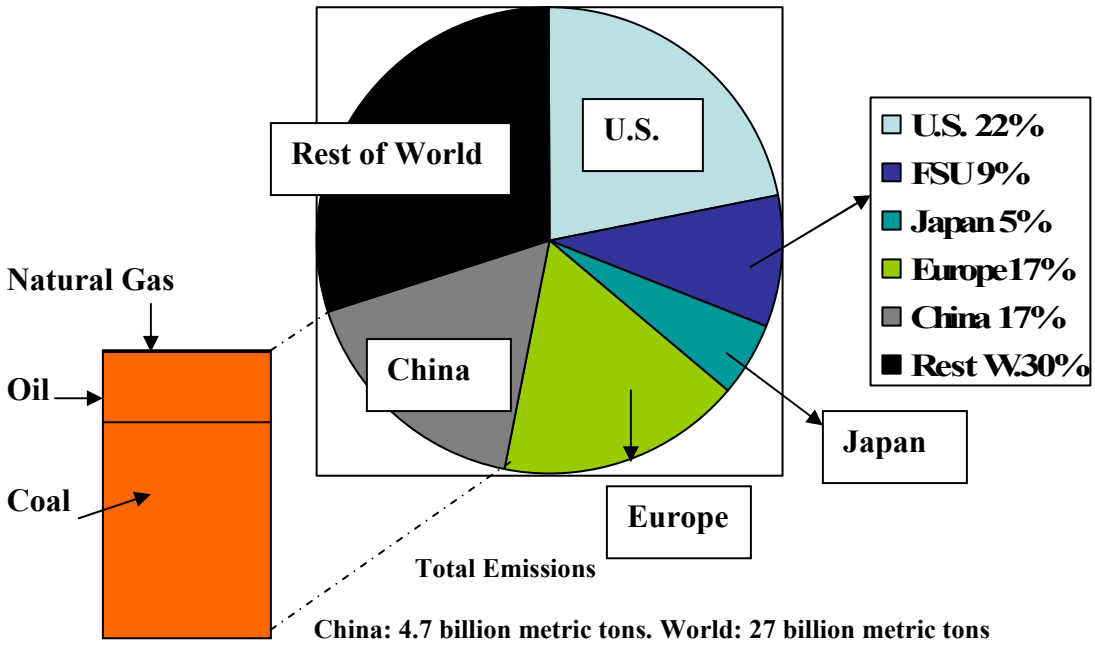
The global threat from China's energy sector is the focus of much international research. The scale of China's energy demand and its rate of growth, combined with its continued dependence of fossil fuels are almost certain to result in China becoming the world's largest contributor to carbon dioxide emissions. (See Figure 3.1)

Recently, the International Energy Agency announced that China will surpass the United States in 2009 as the biggest emitter of the main gas linked to global warming, nearly a decade ahead of previous predictions.[15] Therefore, China's rise fuelled heavily by coal, is particularly troubling to climate scientists, because as developing country is exempt from the Kyoto Protocol's requirements for reductions in emissions of global warming gases.

The Chinese government has taken several steps to improve environmental conditions in the country. Among these is the new Law on Renewable Energy, which took effect on January1, 2006. The new law seeks to promote cleaner energy technologies, with a stated goal of increasing the use of renewable energy to 10 % of the country's electricity consumption by 2010 (up from roughly 3 per cent in 2003).[16]

[14] Byrne, J. (1996) "The challenge of Sustainability: Balancing China's Energy Economic and Environmental Goals" *Energy Policy*: 24 (5): 455-462.
[15] International Energy Outlook 2006.
[16] International Energy Agency 2006. Supra note 1.

Figure 3.1 Carbon Dioxide Emissions from Energy Activities, 2004



Source: EIA International Energy Annual

On the other hand, because coal mining itself causes substantial local damage to land and water in the immediate vicinity of mines, some central policies adopted by the Chinese government have been oriented towards the TVCM sector. Lately, in February 2006 China's National Development and Reform Commission (NDRC) revealed a plan to restructure China's coal sector and reduce the fragmentation in the industry, with the goal of establishing five to six giant conglomerates in China's main coal producing provinces and closing down all small coal mines, also known as TVCMs by 2015.

Another collection of research approaches to the environmental damaged has been set internationally with the collaboration of the Chinese. It includes:

- raising the energy efficiency of energy conversion plants;
- investing in clean and renewable energy sources;
- introducing coal practices and technology in mines and coal burning plants;

- expanding the production and use of natural gas;
- improving the effectiveness of implementation of environmental policy and regulations.

According to these challenges, the environment is to a great extent related to the energy industry. This makes clear that environmental concerns are tied at the heart of the energy policy and individual industries. Thus, the next section attempts to quantify the environmental impact of the TVCM sector.

3.1 The Environmental Impact of TVCM

A report published by the World Bank[17] suggests that TVCMs have had a significant environmental impact in China at the national level, especially in the form of solid waste. This report indicates that coal-producing town and village industrial enterprises (TVIEs) lead the discharge of solid waste, and that TVCMs in general are major contributors to waste water disposal. (See Table 3.1) Furthermore, the cement, brick, tile, and ceramic plants at the township and village level, many of which are fueled by poor-quality coal from TVCMs, constitute a major source of atmospheric pollution.

[17] Nygrad, J. and Guo Xiaomin (2001). *Environmental Management of China's Township and Village Industrial Enterprises.* Washington D.C.: World Bank.

Table 3.1 Different types of pollution from TVIE mining activity in 1995 showing ranking compared to other TVIE activities, percentage of all TVIE pollution, and total quantity of pollution. (mmt= million tonnes; mt= thousand tonnes)

Pollutant	TVIE Activity	Rank	Percent	Quantity
Waste water	Mining	2nd	12.3	727 mmt
SO2	Non-metal mineral production	1st	50.3	2,249 mt
Soot	Non-metal mineral production	1st	64.4	5466 mt
Industrial dust	Non-metal mineral production	1st	76.7	10,133 mt
Solid waste discharged	Coal mining & processing	1st	42.2	74 mmt

Source: Nygrad, J. and Guo Xiaomin (2001). *Environmental Management of China's Township and Village Industrial Enterprises.* Washington D.C.: World Bank

An unequal amount of all of these forms of pollution occurs in the poorer provinces of western and central China. The 60 per cent of the solid waste discharged from TVIEs is reported from just five provinces, Shanxi, Yunnan, Hunan, Hebei, and Sichuan, all of which have important TVCM activity. Roughly half of this discharge occurs in Yunnan and Shanxi. It is therefore probable that a significant amount of the solid waste pollution generated in these five provinces originates from TVCMs.

For example in Shanxi Province, which accounts for some 25 per cent of China's total coal output the current conditions are:

- 13 per cent of the total land area of the province is affected by coal mining;
- 650 square kilometers of land is subject to subsidence;
- more than 200 square kilometers of land is occupied by coal refuse tips totaling more than 270 million tonnes in weight;

- more than 20, 000 square kilometers of land required rehabilitation as a result of coal mining.

This data illustrates the scale of the rehabilitation problem in Shanxi Province alone, due to the coal mining activity, where the TVCMs account for a substantial proportion of the land damage. While the Chinese government policy to close unsafe and illegal TVCMs in 1998 was an attempt to reduce the environmental degradation of land and coal resources, some local governments and their communities have not implemented the closure policy yet, which represents the persistence of the negative effects of TVCMs, such as the ecological damage.

From this perspective, the Chinese government might have a clear intention to reduce its dependence on coal and the corresponding ecological damage; however administrative reforms towards this purpose, such as the closure policy of TVCMs, have failed during the process of policy implementation. Then, since local governments are the foot soldiers of policy implementation, local bureaucrats and the regulatory structure for small coal mines are determinants in how public policy is implemented at the local level. Therefore, to understand the rationale of the local actors and their behaviour within the institutional structure opens a window into the process of policy implementation in China.

4. Who Decides Public Policy and How? : Challenges From Below

A major issue in studying central-local relations in China is the increasing resistance and distortion of central government policies at local levels. Given that policy initiatives in China are imposed in a top-down manner, where policy implementation is a specific task for county and township governments, "sometimes county and township public servants or bureaucrats will engage in purposive behaviour during this stage, shaping or distorting administrative reforms towards their utility, and there are probably some elements in their utility other than the general welfare and the interests of the state".[18]

The Rational Choice Theory[19] plays a central role understanding the bureaucrat's behaviour and its influence on bureau policy. This theory sustains that what bureaucracies do can be understood by viewing bureaucrats as self-interested utility maximizers. William Niskanen and Patrick Dunleavy are main exponents of the rational theory of the self-maximizing behaviour.

Niskanen paid detailed attention to what bureaucrats sought to maximize. For example, the rational assumptions of economics argue that in making decisions and taking actions, an individual seeks to maximize personal utility. In economics, utility works with the idea of decisions that give more of something, i.e. wages, profits, and consumption opportunities are presumed to increase utility. From this perspective, Niskanen argued that most of these variables are tied to the budget of a given agency. If such things as salary,

[18] Niskanen, William. (1973) *Bureaucracy: Servant or Master? Lessons from America*. Great Britain: The Institute of Economic Affairs: 20

[19] "Rational Choice Theory is neoclassical economy theory applied to the public sector. It seeks to build a bridge between microeconomics and politics by viewing the actions of citizens, politicians, and public servants as analogous to the actions of self-interested producers and consumers" Buchanan, 1972 quoted by: Frederickson, H.; Kevin Smith. (2003) *The public Administration Theory Primer.* U.S.: Westview Press.

power and prestige are tied to the overall budget of an agency, the rational bureaucrat therefore should struggle to make that budget as large as possible.[20] Then, Niskanen suggested that budget-maximization serves as a good alternative for the utility of the bureaucrat.

Additionally, Patrick Dunleavy proposed "the bureau shaping model".[21] He assumes that bureaucrats maximize self-regarding utilities in making official decisions. Official's influence on bureau policy is always extensively rank-structured, with those near the top being most influential. Thus, bureaucrats, especially the more senior, put less stress on the components of their utility function, such as income, job security or bonus. Instead, they place more emphasis upon non-pecuniary utilities: such as status, prestige, patronage and influence. Therefore, when many officials shape a bureau's policy, budget-maximization is a collective rather than an individual way of increasing bureaucrats' welfare.

We might wonder why the rational self-maximizing bureaucrat behaviour exposed by Niskanen and Dunleavy has an explanatory value for the Chinese case. The reason is that in the *budget maximizing model* and the *bureau shaping model* bureau organizations are representing as top- down structures, which has significance for the Chinese state, given its hierarchical structure from central government to village level. To make clear this point, it is valuable to mention the Chinese concept of local government. "It corresponds to an *integrational model,* whose purpose is to be a vehicle for the implementation of policies and decisions made by the central governments. In contrast to an *autonomous model*, whose main purpose is to achieve the aspirations of the communities".[22]

[20] Niskanen, William. Supra note 19: 20
[21] Dunleavy, Patrick. (1991). "The Bureau-Shaping Model": *Democracy, Bureaucracy and Public Choice; Economic Explanations in Political Science.* London: Harvester Wheatsheaf: 174-209.
[22] Sharpe, L.J. (1974). "Theories and Values of Local Government", *Political Studies* 18 (2): 153-74.

The *integrational model* of local governments in China is evident since county and township/ town governments still do not enjoy much institutional autonomy and are still primarily policy-implementations tools of the central and provincial governments.[23] For example, local government policy priorities in China reflect intimately the policy priorities of its central government. Currently, these include: economic growth, social and political stability and party construction.[24]

Then, if the Chinese local government is essentially an agent of the state, the perspective of local officials as rational actors provides an appropriate framework for analysis.

Historically, the Chinese government with the post-Mao reforms sought to give some independence to the local governments through various decentralization reforms. These included an extension of financial autonomy, delegating decision-making powers and fostering a more flexible approach to local economic development. Through these reforms local governments and their bureaucrats got some "autonomy" from the central government. For example, with the growth of township and village enterprises (TVEs) many local bureaucrats and private actors were able to accumulate economic wealth, political power and prestige. However, some authors argue that "(…) even thought decentralization ought to have increased Chinese local government's fiscal independence, in reality it had not necessarily freed the localities from their dependence on budgetary subsides and transfers from the center".[25]

---

[23] Zhong, Yang. (2003*) Local Government and Politics in China: Challenges from Below*. London: M.E. Sharpe: 128.
[24].Zhong, Yang. Supra note 23.
[25] " (…) the expenditures handed down to the localities were often greater than the revenues the center returned to the local level, therefore many local government soon found themselves worse off than before and in some cases facing fiscal starvation". Source: Wedeman, Andrew (2000) Budgets, Extra-budgets, and Small Treasuries: illegal monies and local autonomy in China. *Journal of Contemporary China*, 9 (25), 489-511.

Currently, in the third decade of reforms, the Chinese government has embarked on a new round. It includes offloading local government enterprises onto private or corporate entities, a rationalization of local bureaucracy, and some recentralization of power as the national government seeks to build a regulatory and fiscal framework suitable for market economy.[26] It means that the central government now wants the control back. However, those localities that were benefited during previous reforms are unwilling to relinquish their new found-making powers.[27]

Through the premise of Chinese local government as an agent of the state, Niskanen and Dunleavy models assume that public servants are limited in what they can gain personally from reforms, limitations imposed centrally, such as salary levels, fringe, benefits, etc. Therefore, as rational actors - self maximizers- they will "shape" the bureau policies whenever they stand to lose or to gain.

In the Chinese case there is evidence to suggest that such restrictions on the power of Chinese local officials to divert resources for community interest and even personal welfare have been seriously challenged by the "role conflict" or dilemma that officials face in implementing the new market oriented reforms. "A failure by leading county and township/town officials to meet these policy goals will disqualify them from further promotion even if they perform exceptionally well in all other areas".[28] However, since county and township governments are the foot soldiers of policy implementation, some local officials have been able to ignore or omit the new central policies whenever they perceive them as a threat to their political carriers or economical powers.

---

[26] Cheung, Anthony. B.L, (2005). "Bureaucrats-Enterprise Negotiation in China's Enterprise Reform at the Local Level: case studies in Guangzhou", *Journal of Contemporary China* 14(45): 695-720.
[27] Cheek, Timothy (2006). *Living with Reform, China since 1989.* Global History of the Present: 108-109.
[28] Zhong, Yang. Supra note 23 : 132

Furthermore, policy implementation in China has depended on an institutional structure that has showed little improvement in effectiveness over the last years. The complexity and disjointed system of the Chinese institutional structure (different levels of government and agencies) have made very difficult for higher levels of government to drive the implementation policies on the ground (i.e. the environmental regulation of TVCMs). The effort to adhere to all the relevant regulation is too great that some local officials do not fully implement it. In addition, it is extremely difficult, if not impossible for the superiors or higher levels to monitor local official's actions. Thus, policy non-compliance and cheating by the bureaucrats are very likely to occur.

And this situation appears to be just as applicable to the Chinese coal sector and the TVCM closure program of 1998. It is one of the few examples in recent years in China's domestic energy sector of a policy initiative driven by the political elite in a top-down manner, which has experienced an incredible resistance and distortion at the local levels. Therefore, to analyze the closure policy of TVCMs provides a useful insight of the challenges for an effective implementation policy for the coal sector and its environmental impact.

4. 1. Case Study: The Closure Policy of TVCMs

The TVCM sector is one that repeatedly makes the headlines and rise to the top of the Chinese government's agenda. The persistent failure of government to address the issue of concern in the sector may provide an observer with a window into the fundamental and long-term strengths and weaknesses of government policy formulation and implementation.

From the later 1970s to the mid 1990s the output from these mines supported China's economic growth. In the last few years they have become outcasts from China's economy firstly because of the oversupply of coal, which has threatened the viability of the large state coal mines and secondly, because of their poor safety and environmental record. As a result the TVCMs have been subject to one of the most vigorous and sustained programmes of enterprise closure seen in modern China.

According to official statistics some 60,000 TVCMs were closed in the years from 1998 to 2001, with the loss of hundreds of thousands of jobs and a reduction in output of some 400 million tones, equivalent to nearly 30 per cent of the country's total coal production in 1996. However, some lines of evidence suggest that the gap between reality and official statistics concerning the closure of TVCMs is substantial, and that a large and unquantifiable number of illegal TVCMs are still in operation.

4.2 The TVCM sector

Coal mines in China are traditionally classified in terms of size and ownership: major state-owned coal mines (MSOCM); local state-owned coal mines (LSOCM); and small-scale township and village coal mines (TVCM). In 2002, there were 119 MSOCM each producing on average 598, 300 tonnes annually; nearly 2,000 LSOCM each producing on average 132,000 tonnes annually; and 32,000 TVCM each producing on average 13,000 tonnes of coal annually. In 2002, MSOCM provided 51% of China's coal production, the LSOCM provided another 19%, and the TVCM accounted for the

remaining 30% of coal production.[29](Appendix 1-Table 4.1 shows the total coal mine output in China from 1980 to 2004.)

Regarding the TVCMs, a large proportion of them are owned and controlled by local governments at township and village level. A substantial minority of TVCMs, usually the smaller ones, are privately-owned. Other TVCMs are owned by state agencies.[30] This ownership rights, in particular those in hands of bureaucrats have caused a conflict of interests between central and local governments.

In terms of their distribution across China, although nearly all thirty two provinces, municipalities and regions had some TVCMs, about 92 per cent of these mines lay in just 16 provinces.[31] In these provinces the TVCMs output as a proportion of total coal output varied from as little as 29 per cent in Hebei in the north as much as 82 per cent in Guizhou in the south. (Appendix 2-Table 4.2)

Historically, the output of China's TVCMs increased one hundred-fold from about 6.5 million tonnes in 1957 to 659 million tonnes in 1995 when the sector reached its peak nearly forty years later.[32] The growth of these mines depended both on the state of the economy as a whole and on the policies towards these mines. As a result a number of periods of rapid output growth can be identified, separated by periods of relative stagnation.

The 1950s was the year when the first rural collective coal mines were established after the Communist Party came to power. The demand for energy for the local

[29] Creedy, D. and Wang Lijie. (2006) "Transforming China's coal mines: A case history of the Shuangliu Mine" *Natural Resources Forum* (30): 15-26
[30] Creedy, D. Supra note 29, p.16
[31] Zweig, D. (1997) *Freeing China's Farmers. Rural Reconstruction in the Reform Era*. New York: M.E. Sharpe: 256.
[32] Horri, N. (2001) "Development of Small- Scale Coal Mines in Market Transition and its Externality", in N. Horri and Gu Shuhua (eds) *Transformation of China's Energy Industries in Market Transition and its Prospects.* Japan: Institute of Developing Economies: 23-63.

communities during the Great Leap Forward[33] resulted in an increase in coal output from these small mines from 6.5 million tonnes to 22 million tonnes during the period 1957-1960.[34] However, the chaos of the early years of the Cultural Revolution and the focus of government policy on the development of large mines contributed to limit the expansion of the small coal mines during the 1960s.

In the 1970's the government decided that the large and the small coal mines should equally contribute to the nation's energy supply. It was called the "two legs policy". In this time, the output of the small collective coal mines grew from 31 million tonnes to 114 million tonnes, which represented the 18 per cent of national coal production.

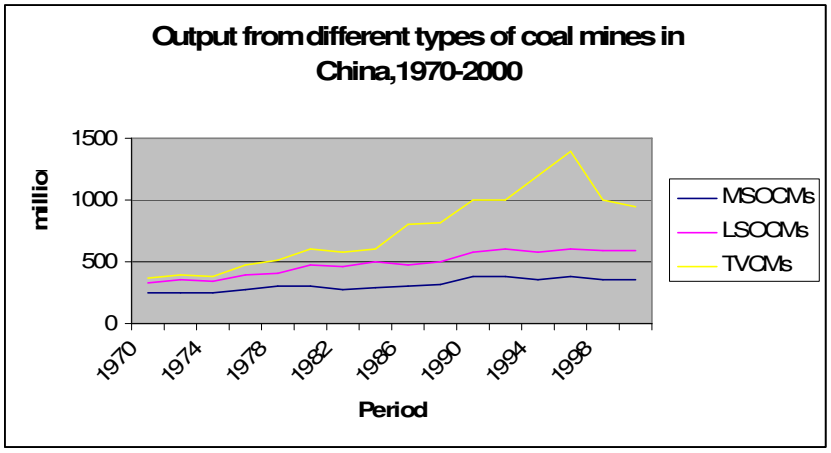
In the 1980s a number of successful measures were specially designed to promote the development of TVCMs, such as higher level of subsides, tax allowance, investment in infrastructure and fund for the maintenance for the mines. The main objective was to increase the level of national coal output by whatever means were necessary, and to encourage coal production for local consumption and therefore ease the pressure on the railways and waterways. Additionally, "in 1983 the township and village enterprises (TVEs) were promoted as part of the strategy of stimulating the economic activity at this level" .[35]

In general, with the policy implementation of the 1980s, 400 million tonnes were reached by 1991 and, after a slowdown from 1989-199, output peaked at 659 million tonnes

[33] The Great Leap Forward was an economic and social plan used from 1958 to early 1962, which aimed to use China's vast population to rapidly transform China from a primarily agrarian economy into a modernized, industrialized communist society. Mao based this program on the theory of productive forces. For more information look at: http://www.mtholyoke.edu/courses/sgabriel/economics/china-essays/4.html
[34] Horri, N. Supra note 32: 23-63.
[35] Zweig, D. Supra note 31:256.

in 1995. By this time the TVCMs produced 48 per cent of the nation's coal.[36] (See figure 4.1)

Figure 4.1



TVCMs= township and village coal mines; LSOCMs= local state-owned coal mines; MSOCMs= major state-owned coal mines.

Source: Thomson, E. (2003) *The Chinese Coal Industry: An Economy History*. London: Routledge Curzon.

However, the last stage of growth was the most remarkable. When coal prices were released from state control in 1993, the TVCMs output rose 180 million tonnes in the years from 1993-1995, accounting for 90 per cent of the national incremental output.[37] (See figure 4.1). In sum, the policy measures of the mid 1980s succeeded in lifting enormously the level of China's domestic energy production, but at the same time they created a complex sector that was really difficult to manage.

[36] Thomson, E. (2003) *The Chinese Coal Industry: An Economy History*. London: Routledge Curzon.
[37] Thomson E. Supra note 36.

4.3 The Closure Policy of TVCMs

Why are they really closing the mines?

Since 1998 the Chinese government has adopted the national policy to close TVCMs where possible, and replace them with more modern, large scale operations. From one perspective this campaign was announced as part of China's intention of making China's coal industry more sustainable[38], although in 1998 senior government officials were quite explicit that the campaign to close TVCMs was directly influenced by the need to reduce the oversupply of coal generated by them and to protect the state-owned mines.

In 1997 there was a decline of total primary energy consumption and it was certain to continue. This drop of demand particularly affected the coal industry, and stock piles reached levels in excess of 200 million tonnes. By 1999 the end-use of coal had fallen to 37 per cent below the level for 1996.[39] This substantial oversupply of coal posed a major threat to the larger state owned mines into which large amounts of government investment had been directed over the previous years. The obvious perpetrators were the township and village mines which were able to sell at prices below the costs of the state owned mines. Facing this situation, Chinese senior officials were clear that the campaign to close the TVCMs was mainly influenced by the need to reduce the oversupply of coal and to protect the state-owned mines. Other consideration included the need to close illegal and unsafe TVCMs.

The TVCM closure policy of 1998 was part of a wider program of coal industry

[38] As an attempt to eliminate some of the high costs generated by the TVCMs such as waste of natural resources, poor safety and environmental record, besides the fact that workers in TVCMs receive low wages, not benefits and inadequate training. See for more detail: Creedy, D. Supra note 29.
[39] Sinton, J.E. Supra note 4.

reform which included the closure of some larger mines and the bankruptcy of selected large coal mining enterprises. The plan was announced by the central government to close some 25,800 illegal and "irrational" mines (mainly TVCMs) by the middle of 2000 in order to reduce output by 250 million tonnes per year.

Categories of TVCMs targeted for closure included: [40] Mines with neither mining nor production licenses; 2) mines opened within the licenses areas of state-owned mines since 1st January 1997, which, by law, could not have been granted a mining licenses; 3) mines opened within the licenses areas of state-owned mines before 1st January 1997 which had mining licenses but which lacked production licenses; 4) mines opened within the licenses areas of state-owned mines before 1st January 1997 which had mining licenses but which had a negative impact on the state-owned mines; 5) mines exploiting coal with high sulphur and ash content, and without appropriate countermeasures; and 6) mines operating outside the licenses areas of state-owned mines, which had mining licenses but not production licenses.

According to government policy, compensation would be paid only to mines in category 4, as they were the only fully legitimate mines on the list. Mines in category 6 were given the opportunity to raise their technical and safety standards and apply for a production license before the end of February 1999. The smaller mines in this category were encouraged to merge with other mines to provide the financial and technical benefits of scale.[41]

The key levels for the implementation policy were the provincial and county governments. Provincial governments had the responsibility to prepare a strategy for the

[40] UNDP, World Bank Energy Sector Management/ Assistance Programme (ESMAP) (2006) "Toward a Sustainable Coal sector in China" : 31-32
[41] UNDP, World Bank Energy Sector Management Supra note 40.

province and to negotiate or allocate closure targets for lower levels, while county governments had the task of implementing the closures.

5. Why has the TVCM closure policy failed?

5.1 Policy Implementation at County and Township Levels

As I mentioned it before, county and township town governments in China still do not enjoy much institutional autonomy and are still primarily policy- implementation arms of the central and provincial governments. Even though decentralization has been a major theme in post-Mao reforms during the last two decades, the local governments still dependent from the center. Hence, "it is difficult to achieve an adequate understanding of public policy implementation in China without bringing in local levels, particularly county and township/ town government policies: the foot soldiers in implementing central government policies in China".[42]

5.1.1 Chinese Local Officials as Rational Actors

A major issue in studying central-local relations in China is the increasing resistance and distortion of central government policies at local levels. It is too simplistic to say that central government policies are just ignored or distorted. Policy implementation in China is more complicated. Much depends upon policy issue areas, which is interconnected with ***the***

[42] Zhong, Yang. Supra note 23: 128.

rational career behaviour of local government officials; just as it was exposed by Niskanen and Dunleavy models of self-maximizers' behaviour.

Then, the dilemma for local official is: On one hand, local officials are legally and politically obligated to implement polices passed on to them. Administrative punishments or even removals from office remain the most effective mechanisms by which higher authorities force local government officials to carry out and comply with central or provincial government policies. On the other hand, there are many personal and community interests that local officials have to take into consideration when implementing policies from above. How to balance the two skillfully is an art that local government officials must master in order to enhance career advancement.

In the case of the coal sector and the closure policy of TVCMs the self interest of local bureaucrats has been affected by the closure campaign; but also due to the "Cadre contract system" local officials have experienced political pressure to demonstrate successful reduction of coal production from small mines in order to fulfill planned targets. As a result, unofficial statistics show that local government officials have been cheating during the implementation stage, providing false statistics about coal production and the number of closed mines. Therefore, even when the Chinese government has declared the closure campaign as a political success, it has not achieved its main objectives on the ground.

Local Officials and the Self-Interest Behaviour

The "role conflict" or "dilemma" experienced by local officials through the closure campaign of TVCMs permeates the entire township and village enterprise (TVE) sector in China. Historically, the great economical growth of the TVCMs in the 1980s implied the strategy of promoting the development of others TVEs. The idea behind was to promote the local investment, because township and village levels of government received little or no funding from above.[43] As a result of this strategy, enormous benefits were generated for the local communities and their officials. They sometimes acted as owners of the TVCMs and TVEs. Therefore, since the closure campaign of TVCMs has been declared, many local officials have been unwilling or unable to implement the closure policy.

By the mid 1990s the number of TVCMs probably exceeded 80,000 and they employed between 2 and 4 million people.[44] In many remote and otherwise poor locations, the TVCMs provided a vital engine for economic growth and development. New industries were developed to supply and service the coal mines (and in response to the growing supply of cheap energy); which improved local infrastructure and facilities, and provided the employment of significant numbers of otherwise redundant agricultural workers.

Thought many TVCMs and TVEs were officially collective owned by the residents, in reality many local governments acted as owners of the enterprises within their jurisdictions. The role of private ownership varied greatly from province to province. (See appendix 2, Table 4.2) TVCMs in provinces with a strong industrial base and a powerful presence from state coal mining companies tended to be owned by collectives (for example

[43] Zweig, D. Supra note 31:256.
[44] UNDP, World Bank Energy Sector Management Supra note 40.

in Shanxi and Hebei Provinces). In more rural provinces such as Yunnan and Guizhou, private individuals owned as many as 80 per cent of the TVCMs.

In the jurisdictions where local governments acted as owners of the TVCMs and TVEs, they were able to collect a range of benefits from TVCMs such as, higher levels of employment, tax revenues, and income according to their status as owners of TVCMs. This in turn allowed local governments to make forward local development at a rapid pace. (See appendix 2, Table 4.2 and the information about GDP per capita and rural income per capita.).

The local government's leaders provided a vital support to the TVCMs in the form of preferential access to low interest loans. They had the power to redistribute revenues between TVCMs, to provide tax breaks, to appoint managers and to permit the systematic under-reporting of economic activity. Thus, a close relationship between local governments and their TVCMs was created by the ambiguous nature of the ownership rights. At the same time, the families of the local officials, in their private capacity, have succeeded in gaining control over the TVCMs. As a result, the self-interest of local government's officials progressively replaced the community interests as the driving force behind the success of the TVCMs.

Consequently, the close relationship between government and TVCMs (ownership rights) created a fundamental conflict of interest between lower and higher levels of government. Then, when the closure policy of TVCMs was adopted without consultation (including local officials and environmental agencies), and without planning for mitigation, the most affected were the local officials and their communities, who were economically tied to the growth of the TVCMs. Those affected included:

- Local government, which experiences a decline in revenue, so reducing its capacity to invest in new infrastructure and facilities.
- Mine owners, including local government owners, who receive little or no compensation for lost assets and were only entitled to compensation if deemed a wholly legal operation.
- Redundant mine workers who have few opportunities to find sustainable, alternative employment.
- Local farmers for loss of compensation for use of land by TVCMs and no likelihood of reclamation or rehabilitation of polluted land and water.
- Local energy users who, in the absence of locally available low-cost coal, may be tempted to cut down trees for firewood and damage the environment.

Provincial governments were charged with formulating the compensation policies for the category 4 mines. (See Categories of TVCMs targeted for closure at previous section) In Jiangsu, for example, the government decided that 100,000 Yuan should be paid for each 10,000 tons of capacity closed. However, there are indications that few provinces declared a compensation policy, let alone actually paid out money. No compensation appears to have been offered to owners of mines in other categories. Private individuals and local governments, many of whom had invested in good faith, believing that their enterprises were legitimate, have lost substantial amounts of money. At present, legal claims through the courts are not a practical.

Therefore, in order to keep those benefits generated by the TVCMs and avoid the economical negative impacts on their personal interests and the communities, local officials have been reluctant to implement the closure policy; sometimes providing false statistics

about the number of mines closed and coal production; while some other mines have been re-opened after the central government inspections ordered to close them.

Local Officials and the "Chinese Cadre Contract System"

The other side of the "role conflict" or "dilemma" experienced by the Chinese local officials is that they are legally and politically obligated to implement polices passed on to them from above. It is dictated by the "Chinese cadre contract system" *(Zhengzhi zeren zhi)*, a political version of the popular economic production contract system, which was adopted in rural China in the early 1980's. "Leading Party and government officials sign a contract with their superiors in which specific numeric targets area laid out for policy fulfillment and performance evaluation at the year's end".[45]

Three crucial policy issues usually integrated this political contract. These are: (1) Maintaining local social and political stability, (2) economic development, and (3) population control. "The three issues are often refereed to as "veto issues", meaning that failure by leading county and township/towns officials to meet policy goals in these three areas will disqualify them from further promotion even if they perform exceptionally well in all other areas".[46]

Even though the county Party secretary and the township / town Party secretary and the township/ town Party secretary are not direct participants of the performance contract, they are however legally responsible for any failure to fulfill the crucial policy targets since they are also held responsible for implementing these crucial policy issues. Deputy country magistrates and township/town mayors who are specifically in charge of these policy issue

[45] Edin, Maria (1986). "The political incentives of Local Cadres in the PRC", *Journal of Social Sciences*, Hong Kong: 45-66.
[46] Zhong, Yang, Supra note 23: 132.

areas, are directly responsible for any policy failure in their charged areas and area targeted for punishment.

The closure policy of 1998 was announced as an open attempt to reduce the oversupply of coal generated by the TVCMs and to protect the state-owned mines. Since then, the closure policy has been imposed in the policy programs for provincial, county and township governments. What it has implied is that village party secretaries and villagers' committee chairs have signed responsibility or performance contracts with the township/town government, even though these village "*cadres*[47]" or officials are not officially state cadres or employees. For this reason, since 1998 the Chinese central government has been promoting nationwide verifications of coal mine production capacity as a way to secure those cadres or local officials have been meeting the targets of the closure campaign.

Even though the cadre contract system as practiced at the local levels has helped the central government and provincial authorities in China to achieve some specific policy goals and policy obedience from township/ town and village officials (such as those in charged of implementing the closure policy of TVCMs), this system has also caused policy cheating and distortions in Chinese local areas.

"Policy cheating is mostly likely to occur when the policies of higher governmental authorities clash directly with local governments interests, or when specified quantifiable policy goals are simply out of reach".[48]

[47] The most broad and general definition of a cadre is someone who is a paid state employee. Hence, the official term for the cadre concept is "state cadre" or *guojia ganbu*. Yet cadres also include rural village (*cun*) and urban street (*jiedao*) officials who are formally not state employees. Zhong, Yang, Supra note 23: 95.
[48] Zhong, Yang. Supra note 23:143

Policy cheating

The relationship between Chinese higher level officials and local officials resembles the principal-agent relationship between politicians (principal) and bureaucrats (agents) in the West, just like Niskanen and Dunleavy models of bureaucrat's behaviour explained it. The politicians, or elected officials, are decision-makers (superiors) while the bureaucrats (subordinates to politicians) implement policy decisions made by politicians. However, cheating in policy implementation by local officials (bureaucrats) is a common phenomenon in China today.

Policy cheating primarily involves deliberately false reports and number fabrication.[49] For example, according to a study made by the UNDP-World Bank Energy Sector Management[50], even when the central government's view appears to be that the TVCM closure program has been doing well; it is likely that the actual extent of mine closures and production abatement is significantly less than reported.

Official data from the central government say that 63,000 mines had been closed by the end of 2002, with a consequent drop in TVCMs output from 710 million tonnes in 1996 to 255 million tonnes in 2001. The level of annual national coal production was reduced from nearly 1,400 million tonnes in the mid-1990 to about 1,000 million tonnes in 2001.[51] Thus, from the central government's perspective the main objective of protecting the state-owned mines has been achieved with the closure campaign of TVCMs. However, the study by the UNDP-World Bank Energy Sector Management says that previous official data are not reliable, since has been accounted that local officials were submitting false statistics

[49] Zhong, Yang. Supra note 23:143.
[50] UNDP,World Bank Energy Sector Management Supra note 40
[51] UNDP,World Bank Energy Sector Management Supra note 40

during the closure campaign.

Since TVCMs provided an important source of employment and revenue from taxes and fees, local officials were tempted to lie about the number of closed mines and coal production. Thus, some reports were deliberately falsified and others were inexact because closed mines had subsequently been re-opened. Large numbers of mines were continuing to operate illegally even in 2006. For instance, one mine in Hancheng city, which supposedly closed in 1999, was still operating despite four attempts to close it; a gas explosion there in February 1 2006 killed two people and injured another two.[52]

In this same argument, a substantial divergence between official figures for coal production and consumption in China since 1998 were provided. For example, some year 2000 estimates of coal production determined by comparing supply and sales data suggested a total coal output of 500 Mt from China's TVCMs, while the official statistics based on local government estimates was about 200 Mt. This difference is a result of false statistics, a consequence of political pressure on local officials to demonstrate successful reduction of coal production from small mines to fulfill planned targets.

As a result, Chinese local officials have been widely criticized for lax enforcement of the closure policy and colluding with coal mine owners to protect local tax revenues, or even profits from their own shares in the lucrative business.

[52] "Coal mine operators ignore closure order", *China Daily*, http://www.chinadaily.com.cn/china2007-02/15/content_809981.htm.

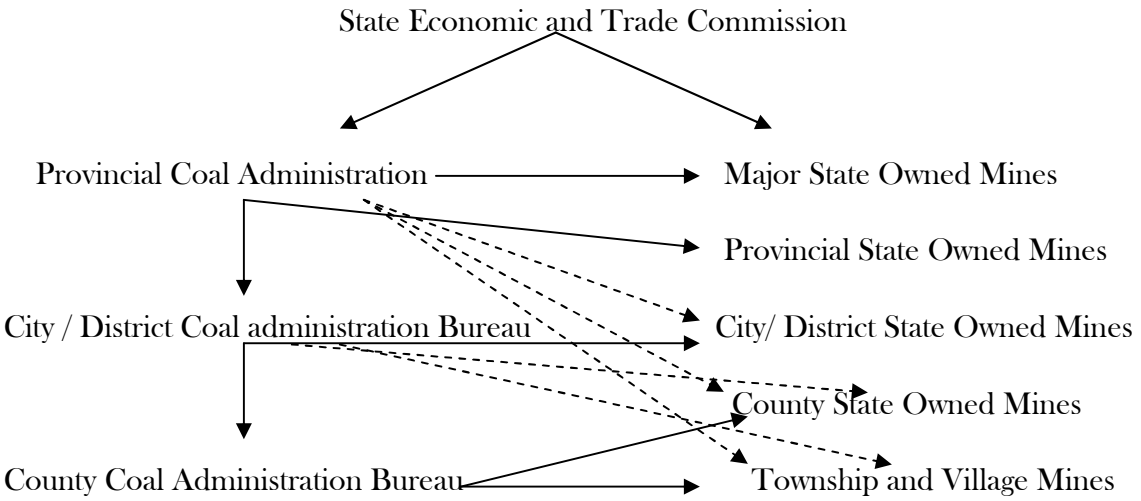
5.1.2 The Institutional Structure & Body of Regulations for TVCMS

The Institutional Framework for Implementation

Cheating by local government officials (bureaucrats) is made even easier at county and township/town levels due to the extreme complex of the institutional framework for implementation. In the vertical dimension, two levels of government are interposed between the central government, which attempts to outline and impose regulation, and the county governments, which have the prime responsibility for implementing regulation on the two subordinate levels at township and village level. (See Figure 5.1)

In the other dimension, at least three vertical lines of government agencies have a direct interest in regulating the TVCMs: those reporting to the Ministry of Land and Natural Resources; those reporting to the State Environmental Protection Agency (SEPA); and the Coal Administration Bureaus at different levels of government. Not only does each reporting line have their own distinct spheres of activity, but al three seek to be involved in environmental regulation. Furthermore, the manager of the township or village mine may be required to report to ten or more additional offices within the township; for example, for water, electricity, health, forestry, and finance. The result is a complex web of overlapping lines of reporting, which is further exacerbated by a substantial, multifaceted and unpredictable burden of taxes and levies to be paid to local governments.

Figure 5.1 A scheme showing how different levels of government were involved in the regulation of different types of coal mine in China in 1998. A bold line indicates direct responsibility. A dashed line indicates overall supervisory responsibility.



Source: Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.

The complexities and deficiencies in the institutional structure have had two major consequences: 1) It is very difficult for the higher levels of government to drive the implementation of TVCMs policies on the ground; because is hard, if not impossible, for the principals to monitor the bureaucrat's actions at the local level and to assess all the information that the agents possess; and 2) the effort to follow all the relevant regulation regarding the TVCMs, such as the environmental regulation, is too huge, that the manager of TVCMs and local officials do not apply it.

Additionally, policy cheating during the closure of TVCMs has made even easier due to the lax of effective auditing and monitoring mechanism and systems due to the complexity of the system. It explains the current action of China's National Development

and Reform Commission (NDRC), which in 2006 issued an urgent notice announcing a planned re-examination of recent verification work on the production capacity of the country's coal mines, especially in TVCMs[53]. The data collected provide important first-hand material for strengthening management and structural adjustment in coal mine companies. However, serious lapses have surfaced during the verification process. Some verification institutions lack professional skills to do the job, while others file false reports on coal mine reserves in collaboration with coal companies.

In fact, regardless the "cadre contract system" and its cadre evaluation system, so far, there are not records about punishments applied to the local officials and TVCMs' managers that have not implemented the closure campaign yet. Those that have been sentenced by Chinese courts are just managers where occurred fatal coal mine gas explosions that killed their mine workers.

Laws and Regulations related to TVCMs

It has been explained that policy implementation in China relies on an institutional structure which has showed little advance in effectiveness over the last years. However, it is in the energy and natural resources sectors that the negative impact of such administration has been particularly pronounced. The ineffective regulation of the TVCMs and its institutional structure have made really difficult for higher levels of government to drive the implementation policy of TVCMs on the ground; especially those policies oriented to improve the environmental performance of the sector.[54]

The structure in which China's small-scale coal mines operated suffered from a

[53] "China to probe coal mine production capacity" (2006-12-01) Available at: http://www.chinadaily.com.cn/china/2006-12/01/content_748630.htm
[54] Andrews. P. Supra note 7.

number of deficiencies. These may be considered within two titles: relating to the regulations of the mines by government and to the support provided to the mines by the government.

A substantial body of law related directly and indirectly to TVCMs now exists in China. These may be grouped under the following four titles: The regulation of rights to the mineral resources (Appendix 3- Table 5.2); the regulation of coal mine operations, including safety (Appendix 3- Table 5.3); the regulation of environmental protection and land management (Appendix 4-Table 5.4); and the regulation of township and village coal mines (Appendix 4-Table 5.5)

The weakness of these laws is that they have been developed and promoted by different agencies at various levels of government with noticeably different agendas, which had led both to duplication and inconsistency; features that are typical for Chinese laws and regulations.

An additional deficiency is that much of the content of these documents refers either to mining in general or to coal mining at all scales, and are quite unsuited to TVCMs. Only from the mid-1990s did detailed regulations and measures relating to TVCMs start to merge. Though they are a great improvement over their predecessors, even these documents seem to have been designed with little concern for the end-user, namely the government officials at county and lower levels and the TVCM managers. For example, issues such as access to mineral rights, land management, water pollution, soil conservation and land reclamation are either omitted entirely or addressed in a superficial way. Therefore, any mine manager or township or village official seeking to understand the legal framework for TVCMs has to become familiar with all the body of law listed in Tables 5.2 to 5.5 as well as local subsidiary regulations. Rather than produce a simple, coherent and coordinated

package of documents encapsulating all aspects of TVCM regulation which may be easily implemented on the ground, the new regulations retained many of the unfortunate characteristics of the earlier regulations.

The ineffective regulation of the TVCMs provides an excellent example of the complex and disjointed system of government at work. Consensus may have been reached on the need to produce more coal at township and village level during the 1980's, but not such consensus existed concerning the environment; and such consensus still does not exist during the closure campaign of TVCMs.

The closure campaign of TVCMs was carried out without following any rule or coherent environmental planning. Those local officials responsible for the campaign referred to a quick implementation involving dynamiting the shaft, blocking it up with cementer or bricks, removing machinery, cutting off utility supplies, destroying buildings and just erecting a sign declaring the mine was closed. There was not consideration about the disturbance or pollution of underground or surface waters.

Finally, the current administrative process to ensure that land affected by mining is restored is ineffective and needs urgent overhaul. There are no severe penalties for those managers, owners of TVCMs and local officials that fail to meet its reclamation obligations, and, even if there were, they may not have enough funds to pay. Currently, not party is accepting responsibility for post-closure surface dangers (gas emissions, surface collapses, and mine water emissions). In fact, there is still no recognition of the potential problem. While these problems could arise at any size of mines, they are likely to be the most severe around closed TVCMs.

6. Conclusions

The study of the closure policy of TVCM provides a good insight into the problems that China faces in reducing its coal production and coal-generated pollution. Essentially, it illustrates the central government's inability to enforce its own law order and eliminate many TVCMs and its environmental impact, associated with corruption among government officials at local and other levels, which is further complicated by a difficult institutional structure.

From this perspective, while China is increasingly active in the area of climate change mitigation, the ecological issue has not yet risen to prominence in domestic policy. For example, the TVCM sector has been detected as the major contributor to waste water disposal, and solid waste in the country. Yet, many of the administrative policies oriented towards the reform of the sector have failed on the implementation stage.

If Chinese leaders are willing to move towards a more sustainable coal sector, it is necessary to have policy implementation at the local level, requiring: First, the central government has to implement compensation policies for actors and communities that have been affected by the TVCM closure campaign. The available evidence suggests that the negative socio-economic impact of the TVCM closure policy has not featured highly in the list of priorities for the higher levels of government and that little or no attempt has been made to address the inevitable impact on communities. Indeed, it is the lack of attention to these issues which has led to the formidable and continued resistance to the closure policy by local governments and their communities. As a result, policies designed for a more sustainable coal sector have failed at these levels.

Second, it is necessary to raise the environmental awareness of TVCM's managers,

local governments and local officials. In my opinion it is especially important to look at the government and its officials, because their environmental awareness and attitudes are decisive in designing and implementing policies, such as growth patterns, which will have a huge impact on the landscape. At the local level, when implementing policies, Chinese government officials are growth oriented and their main concern is coal production, as an essential revenue source that satisfies their own economical and political interests. It means that local government officials behave like bureaucrats-self maximizers. This attitude leads them to overlook problems, which can be very detrimental to the environment.

Additionally, if the "cadre contract system" makes pressure on government officials to fulfill economical and policy targets, then to set environmental standards at all government levels as part of the "veto issues", could be an alternative measure to resolve the ecological problem. It implies that local government officials through the cadre system should be responsible for the environment. Only stronger policies can have a major impact on coal use and emissions at this level. This is why strong enforcement should become an essential component of effective environmental regulations. In this way, local officials and mine management's noncompliance would imply substantial financial penalties.

Third, since environmental regulation accounts the ecological damage caused by the TVCMs, environmental concerns should lie at the heart of the coal industry.The complexity and disjointed system of the Chinese institutional structure (i.e. different levels of government and agencies) have made it very difficult for higher levels of government to drive implementation policies on the ground. The complex bureaucratic structure avoids the direct flow of information from upper to lower levels. It makes extremely difficult for higher government officials to monitor local official's actions. As a result, policy non compliance and cheating by the bureaucrats is very likely to occur.

However, even if the regulatory deficiencies in China's TVCM sector could be addressed, the effective management and regulation for small-scale mines, including the ecological regulation, needs considerable resources. In China, the government agencies suffer from a shortage of staff and funding, and the environmental agencies in particular, lack sufficient status to do their work effectively. Therefore, funding is needed to provide adequate staffing and resources for the government agencies charged with managing and regulating the sector; as well as providing training for both agency officials and miners, and efficient systems for the dissemination of technology.

In conclusion, it is clear that in order to make a successful approach toward the coal sector and its environmental impact, especially in the small-scale mine sector, it is necessary effective policy implementation at the local level, which requires to increase the environmental awareness and commitment of government's officials, a simple system of laws and regulations, as well as a specific system of institutional support, which in turns needs a substantial and sustained level of funding.

7. References

Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.

Brandon, C. and R. Ramankutty (1993) *Towards and Environmental Strategy for Asia,* Discussion Paper No.224. Washington D.C: World Bank.

Byrne, J. (1996) "The challenge of Sustainability: Balancing China's Energy Economic and Environmental Goals" *Energy Policy*: 24 (5): 455-462.

Cheek, Timothy (2006). *Living with Reform, China since 1989.* Global History of the Present.

Cheung, Anthony. B.L, (2005). "Bureaucrats-Enterprise Negotiation in China's Enterprise Reform at the Local Level: case studies in Guangzhou", *Journal of Contemporary China* 14(45): 695-720.

Creedy, D. and Wang Lijie (2006) "Transforming China's coal mines: A case history of the Shuangliu Mine" *Natural Resources Forum* (30): 15-26

Dunleavy, Patrick. (1991). "The Bureau-Shaping Model": *Democracy, Bureaucracy and Public Choice; Economic Explanations in Political Science.* London: Harvester Wheatsheaf.

Edin, Maria (1986). "The political incentives of Local Cadres in the PRC", *Journal of Social Sciences*, Hong Kong: 45-66

Frederickson, H. Kevin Smith. (2003) *The public Administration Theory Primer.* U.S.: Westview Press.

Gao, Shixian. (2000) China, in P.B. Stares (ed), *Rethinking Energy Security in Asia*. Tokyo: Japan. Center for International Exchange.

Horri, N. (2001) "Development of Small- Scale Coal Mines in Market Transition and its Externality", in N. Horri and Gu Shuhua (eds) *Transformation of China's Energy Industries in Market Transition and its Prospects.* Japan: Institute of Developing Economies: 23-63.

International Energy Agency (2006) *"China's Power Sector Reforms, where to next"* OECD/IEA: 33-63.

Niskanen, William. (1973) *Bureaucracy: Servant or Master? Lessons from America*. Great Britain: The Institute of Economic Affairs.

Nygrad, J. and Guo Xiaomin (2001). *Environmental Management of China's Township and Village Industrial Enterprises.* Washington D.C.: World Bank.

Sharpe, L.J. (1974). "Theories and Values of Local Government", *Political Studies* 18 (2): 153-74.

Sinton, J.E. and Fridley D.G. (2000) "What Goes Up: Recent Trends in China's Energy Consumption", *Energy Policy* (28): 671-687.

Thomson, E. (2003) *The Chinese Coal Industry: An Economy History*. London: Routledge Curzon.

UNDP, World Bank Energy Sector Management/ Assistance Programme (ESMAP) (2006) *"*Toward a Sustainable Coal sector in China". Pp-223.

Wedeman, Andrew (2000) Budgets, Extra-budgets, and Small Treasuries: illegal monies and local autonomy in China. *Journal of Contemporary China*, 9 (25), 489-511.

World Bank (2001) *China, Air, Land and Water. Environmental Priorities for a New Millennium.* Washington D.C: World Bank.

World Coal Institute (2006) "Coal –Providing Secure Energy" *Coal: Secure Energy*. Available at: www.worldcoal.org

Zhong, Yang. (2003*) Local Government and Politics in China: Challenges from Below.* London: M.E. Sharpe.

Zweig, D. (1997). *Freeing China's Farmers. Rural Reconstruction in the Reform Era.* New York: M.E. Sharpe.

Additional sources:

"China to probe coal mine production capacity" (2006-12-01), *China Daily,* Available at: http://www.chinadaily.com.cn/china/2006-12/01/content_748630.htm

"China to pass U.S. in 2009 in Emissions", (2006-11-07) *The New York Times*, Available at:http://www.nytimes.com/2006/11/07/business/worldbusiness/07polute.html?ei=5070&en

"Coal mine operators ignore closure order", *China Daily*, Available at: http://www.chinadaily.com.cn/china2007-02/15/content_809981.htm.

8. Appendices

Appendix 1-Table 4.1. Output Share by Mine Management Type 1980-2004
STATE RUN MINES
Mt= million tonnes

Year	Total (mt)	MSOCM Output (mt)	MSOCM Percent	LSOCM Output (mt)	LSOCM Percent	TVCOM Output (mt)	TVCOM Percent
1980	620	344	55.5	162	26.1	113	18.3
1985	872	446	46.6	183	21	283	32.4
1990	1079	480	44.5	205	19	393	36.5
1995	1292	482	37.3	213	16.5	597	46.2
2002	1393	712	51.1	263	18.9	418	30
2003	1736	830	47.8	294	16.9	612	35.53
2004	1956	922	47.1	315	16.1	719	36.8

MSOCM= major state owned coal mines
LSOCM= local state owned coal mines
TVCM= township and village coal mines.

Appendix 2- Table 4.2. Statistical data on output and ownership for township and village coal mines in seven provinces in China in 1995; and selected economic and social data for 1997. t=tonnes; mt= thousands tonnes; Y= renminbi Yuan, Chinese currency.

		Shanxi	Hebei	Sichuan	Shandong	Yunnan	Guizhou	Jiangxi
Total TVCM output per year	mt	157,290	23,827	55,667	11,756	17,998	44,840	16,430
TVCM output/total coal output	%	45	29	58	22	64	82	57
Number of TVCMs		6,700	2,303	7,767	535	5,343	14,431	4347
of which: - collective	%	86	77	67		20	19	18
- private	%	10	16	27		80	79	80
							3,100	3800
Average TVCM output per year	t	23,500	10,300	7200	22,00	3,400		
Contribution of different scales of mine to toal TVCM output								
More than 30,000 t/yr	%		18	25	56			20
10,000-30,000 t/yr	%		62	41	36			31
less than 10,000 t/yr	%		20	35	4			49
Proportion of TVCMs at different scales								
More than 30,000 t/yr	%		4	5	33		1	2
10,000-30,000 t/yr	%		42	19	49		7	10
less than 10,000 t/yr	%		53	76	18		92	88
Net coal imports per year	mt	-235,000	31,000	-4,000	17,000	-100	-13,000	2000
Net coal imports/ total coal production		-68%	37%	-4%	20%	-0.30%	-21%	8%
GDP per capita (1997)	Y	4,774	6,077	3952	7,644	4000	2194	4171
Rural income per capita (1997)	Y	1,738	2,286	1,680	2,294	1357	1298	2107
"Minority"population (1997)	%			5		26.8	22.2	

Source: National Bureau of Statistics, (1998) *China Statistical Yearbook*, Beijing: China Statistics Press.
Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.

Appendix 3- Table 5.2. Laws, Regulations and measures relating to the rights to the mineral resources

Name of instrument	**Year**
Mineral Resources Law, amended	1986-1996
Rules for the implementation of Mineral Resources Law	1994
Regulations for Registering to Explore for Mineral Resouces Using the block system	1998
Regulations for Registering to Mine Mineral Resources	1998
Regulations for Transferring Exploration Rights and Mining Rights	1998

Appendix 3- Table 5.3. Selected relevant laws, regulations and measures relating to the operation of township and village coal mines

Name of instrument	**Year**
Law on the Coal Industry	1996
Administrative Measures for Coal Production Licenses	1994
Implementation Rules for the Management of Coal Production Licenses	1995
Regulations for Coal Businesses and Operations	1996
Law on Safety in Mines	1992
Regulations for Coal Safety Sup.	2000

Source: Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.

Appendix 4- Table 5.4. Select relevant laws, regulations and measures relating to environmental protection

Name of instrument	Year
Law on Water	1988
Law on Environmental Protection	1989
Temporary measures for the Management of Environmental Protection in the coal industry	1994
Law on Water and Soil Conservation	1991
Law on Prevention and Control of Water Pollution, revised	1996
Law on Land Administration, amended	1986-1998
Implementation Provisions for Law on Land Administration	1998
Regulations on Land Reclamation	1988
Implementation Measures for Regulations on Land Reclamation	1998

Appendix 4- Table 5.5. Selected relevant laws, regulations and measures relating to the operation of township and village coal mines

Name of instrument	Year
Circular of the State Council on the Implementation of Industrial Management of TVEM	1986
Administrative Measures for the Township and Village Enterprise Mines in Shanxi Province	1986
Measures for Reorganisation of the Township and Village Enterprise Mines in Shanxi Province	1986
Administrative Regulations for Township and Village Coal Mines	1994
Implementation measures for the Administrative Regulations for TVCMs	1994
Regulations for Small Coal Mine Safety	1996
Law on Township Enterprises	1996

Source: Andrews, P. (2004) *Energy Policy and Regulation in the People's Republic of China*. London/New York: Kluwer Law International.