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Embedded interests and the managerial local state: methanol fuel-switching in China

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No. 152

**Embedded Interests and the Managerial
Local State:
Methanol Fuel-Switching in China**

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Abstract

This paper analyzes the determinants of alternative automobile fuel regulation and development support with a particular focus on methanol fuel. We find that embedded interests, bureaucratic reforms, and political circumstances in the Chinese national, provincial, and municipal governments have all shaped policy outcomes in this area. The paper seeks to explain why at the national level, support for alternative fuels has waned and finds that the concerns of state oil majors and disorganization during the process of national bureaucratic restructuring have been the deciding factors. Interestingly, at the sub-national level promotion of methanol continues unabated in some places. At the local level, business relationships as well as the embedded economic and personal interests of local leaders help to explain managerial local government behavior and sheds light on why government officials actively create and manage methanol fuel business opportunities through local standardization, subsidies, and hands-on management of SOE opposition. The switch towards methanol fuel was more successful in localities where individuals, either government officials or enterprise managers, formed an alliance and made this their 'pet projects'. The analysis draws on 55 interviews conducted between June and October 2010 in Shanxi, a major coal-producing province which has supported methanol fuel-switching programs for over ten years. The findings contribute to debates about the condition of the local state in China. The argument put forward in this paper is that because of limited state capacity at the central level and insufficient concerns for the development of alternative fuels in the short-term, some sub-national governments with strong embedded interests promote certain alternative fuels by taking on active managerial roles, adopting creative and ad-hoc strategies to fill in the national level policy gap at the local level.

Key words: China, local state, policy implementation, energy policy, governance, alternative fuel

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1 Introduction

This research analyzes recent developments in the Chinese methanol fuel and automobile industry, and examines the constellation of actors and interests driving these changes. It rejects conceptions of the Chinese state as a single unified actor, and instead focuses on actors and interests at the national, provincial and municipal levels and examines the varying support levels of methanol business development in these different jurisdictions. National and sub-national leaders promote or fail to promote different energy alternatives, and this research highlights the explanatory factors.

The findings show that at the local level policy-makers form coalitions with enterprises and promote low level blend methanol fuel as an alternative to gasoline based fuel because it fits with their embedded business, economic, social and personal interests. Local governments act relatively independently of the national government because their interests are embedded with respect to the locality. Managerial behavior, as described by Clarke and Newman(1997), is characterized by government actions which involve planning, organizing, or leading economic development. This research finds that local cadres adopt managerial behavior and act as ad-hoc problem solvers by assisting in the planning of business ventures, supporting selected companies by offering access to preferential resources, creating new local methanol standards when these are stalled by opposition at the national level, and negotiating with different state-owned enterprises (SOEs) and other stakeholders to get wider support for the methanol fuel-switching initiative. They do so regardless of the weak to nonexistent regulation and support for blended methanol fuel at the national level caused by opposition from powerful business interests from major state oil companies and intermittent failures in regulatory capacity during reform.

At the central level, energy administration reform and supportive policies for coal-based fuels, including methanol have been stalled by pressure from central SOEs. Standards for low level blend methanol fuels, the most commonly used form of methanol fuel, were seemingly blocked by large state oil companies' opposition. Methanol standards would provide a basis for regulation, quality control, and ultimately the legitimacy of the fuel market. The oil majors' decisive influence in the formulation of such standards highlights the increasingly powerful role played by SOEs. From 2004 to 2010, there were many different government bureaus and agencies in charge of methanol and coal-based fuel promotion which created an atmosphere of pervasive bureaucratic uncertainty. Methanol policy files developed by the National Development Reform Commission (NDRC) were dropped during bureaucratic reforms in 2008, followed by two years of unclear responsibilities and a transition period for new administrators to take them on. By contrast, local governments took charge of blended methanol fuel despite unclear directives and national de-emphasis.

The case study looks at methanol fuel switching in China because it is an especially relevant alternative fuel in China given the domestic natural resources and industrial structure. Methanol can be derived from coal, which China possesses in abundance, and natural gas, among other energy sources. Methanol is produced in the process of making fertilizer and these fertilizer enterprises supply methanol to be used as automobile fuel. Methanol automobile fuel can be used as pure methanol (M100) or as mixes of petrol, additives, and methanol from 5 percent methanol (M5) to the most common mix of 15 percent (M15) up to 85 percent (M85). M5 through M30 are often more widely used as they can be used as fuel in automobiles without significant engine conversions. Both local companies producing and mixing fuel and national SOEs are capable of supplying mixed methanol fuel to the general public, however,

given the supply infrastructure and market dominance of large oil SOE's, oil majors are often the only enterprise players which can distribute the fuel on a large scale.

The analysis of methanol fuel itself illustrates the different benefits and disadvantages of methanol fuel that cause divergent interests among government levels. While not as clean as automobile fuel-switching options like electric, hydrogen, or dimethyl ether (DME), pure methanol fuel (M100) is still cleaner than diesel or petrol, with respect to carbon monoxide and nitrous oxide emissions. Also, emissions from the use of methanol fuel have around half the atmospheric reactivity of those from gasoline which results in less smog (Dolan, 2008). Both of these are strong reasons for sub-national governments to support the fuel, especially for governments that face pressure to address serious local air pollution. On the other hand, although the use of coal-based methanol automobile fuel reduces local air pollution by lowering carbon monoxide and nitrous oxide emissions, blended methanol fuel produces overall greenhouse gas emissions that are twice that of gasoline (Dolan, 2008). This is in conflict with national goals of reductions in carbon intensity.

This analysis concentrates primarily on Shanxi province, which is currently China's second largest coal producer and has a very energy-intensive industrial structure. Shanxi has had national, provincial, and municipal methanol programs for over ten years, in addition to a handful of recent methanol promotion activities in other areas of China, such as Guizhou, Shaanxi, and Zhejiang. The analysis is based on a data set of 55 interviews conducted with government officials and business managers at the national level and at the provincial, municipal, and county levels in Shanxi between June and October 2010. Interviews were conducted with officials from the National China Association of Alcohol and Ether Clean Fuel and Automobiles, provincial and municipal methanol offices, local Economic Commissions, Environmental Protection Bureaus, and Development and Reform Commissions, as well as industrial enterprises involved in methanol-fuel production or distribution, such as fertilizer companies and fuel distributors. Interviews were semi-structured and provided an understanding of overall implementation at the provincial, municipal, and county levels. The analysis also draws from government policy documents, statistical yearbook data, internal enterprise reports, and company visits. The next section introduces concepts and arguments relevant to explaining methanol fuel switching practices at different government levels. The subsequent part provides an historical overview of the methanol automobiles and fuel market in China before focusing on government-enterprise coalitions at the provincial and municipal level in Shanxi over the last ten years. The last section summarizes the key findings and places the analysis in a larger context.

2 Literature Review

In the following, we propose an alternative interpretation of the 'collusion phenomenon' (Zhou 2010) or 'experimentation under hierarchy' (Heilmann 2008) debate. We argue that the so-called collusive or flexible behaviors are triggered by the *absence* of well-defined and appropriate central directives, whereby local officials have no choice but to step in to fill this policy 'vacuum'. Because of a lack of viable short-term policies from above, insufficient resource provisions, and large policy time lags caused by China's long chain of governmental hierarchy, local states increasingly act in an ad-hoc managerial and problem-solving capacity, handling the competing local demands and interests. Central level agencies are not able or willing to micro-manage processes and stalled economic reforms give rise to local governments to act as strategists and entrepreneurs, forming and enabling local linkages with businesses to get things done.

2.1 Central level: Stalled national reform and SOE interests

The assumption is often made that in China a strong central state provides clear directives and mandates to local governments. The problem only lies in the unwillingness or inability of local governments to implementing upper government mandates. This, however, is not always the case, as argued in this paper. A debate has emerged about the unfolding nature of state capitalism in China and recent evidence suggests that further economic reforms become increasingly difficult as the profitability and economic clout of the largest SOEs has grown markedly in recent years. As a growing number of scholars note (Pei, 2006, Downs, 2008a, Eaton, forthcoming in 2011), the SOEs' burgeoning wealth has itself brought a number of new policy challenges. As a powerful interest group, the SOE executive class exerts an increasing measure of control and independence over the policy agenda in many areas and, in some eyes, their influence threatens to freeze China in a partial reform equilibrium. Major state oil majors such as Sinopec and Petrochina have inserted major influence in decision-making practices at the central level, lobbying for their interests and protection of markets. In other words, in the last decade, economic (and political) reforms were shaped in large measure by government leaders' interests in cementing their patronage ties to the state sector (Eaton, forthcoming in 2011).

2.2 Local level: Government behavior, collusion, and flexibility

Previous research has found that many different types of local states exist in China. Scholars have characterized local government behavior as 'developmental' (Shue, 1988, Oi, 1995, Blecher and Shue, 2001), 'entrepreneurial' (Duckett, 1998), 'state corporatist' (Oi, 1992), 'clientelistic' (Wank, 1995, Pearson, 1997), 'predatory' (Bernstein and Lü, 2003, Pei, 2006), 'paralyzed' (O'Brien, 1994), or 'booty socialist' (Lü, 2000). Some scholars have emphasized the role of local governments as intervening in the allocation of capital and labor flows through a strong bureaucracy, high levels of government ownership, and practices associated

with the government's own business ventures (Shue, 1988, Oi, 1992, Duckett, 1998); others have called attention to the fragmented authority in the Chinese bureaucracy (Lieberthal and Oksenberg, 1988). Local governments act as 'independent kingdoms' and factions (Hillman 2010), behaving according to their self-interest and, as a result, frequently collude to mandates and directives from higher authorities. Hillman (2010) explains political behavior in local China through competition over 'spoils', organized around a relatively stable system of factionalism. Zhang and Liu (2010) show that local officials first and foremost seek to advance their self-interests which results in the delay, modification and blockage of reform policies to fit local officials' demands. Along similar lines, Zhou (2010) argues that local governments develop coping strategies that often sidetrack or sabotage national directives, or impose their own interpretation in the implementation process. According to Zhou, collusion among governments is the result of the institutional logic of the Chinese bureaucracy itself, such that with increased decision-making authority and resources concentrating in the centre, "top-down decision making and subsequent resource allocation will depend on correspondingly longer administrative links and different levels of the bureaucracy to *flexibly* implement policy" (2010: 73). China's authoritarian decentralized structure (Landry, 2008) and centralization of resources thereby provide both the organizational basis and the institutional environment for collusive behavior. Zhou admits that it is "difficult to distinguish collusive behaviors and reasonable flexibility in the actual process of policy implementation, with the latter having broad legitimacy" (2010: 72). Succinctly, the so-called collusive behaviors might under certain circumstances reflect local officials' efforts to get jobs done through *flexible* implementation of state policies. The flexible characteristics and experimentalist nature of local policy implementation in China has been pointed out by Heilmann (2008, 2009), who argues that experiment-based policymaking at the local level and 'experimentation under hierarchy' aids the incorporation of local knowledge into the national policy process.

2.3 Local level: The managerial state and embedded local interests

With China growing rapidly and becoming increasingly integrated with global markets, social, economic, political or environmental issues have become more complex and highly inter-linked. This, naturally, brings along structural and institutional realignments, but importantly, this also changes how agents work in these changing structures. It is often the local states that need to deal directly with the tensions and dilemmas of rapid and unpredictable social, political, economic changes. Government officials manage fast-changing and often contradictory policy agendas and need to handle an ever increasing number of injunctions and mandates from the central government. Government cadre need to be able to create and adapt a range of different managerial practices to create strategies to respond to emerging complex dilemmas (Kostka and Hobbs, 2010). As argued in this paper, the concept of 'local managerialism' helps to identify a distinctive set of managerial practices which form one of the underpinnings of an emergent political settlement.¹ To manage, a verb deriving from the Italian *maneggiare* (to handle) refers to a wide scale of functions, including creating ideas, developing visions, planning, negotiating, staffing, organizing, commanding, coordinating, supervising, controlling, all with the purpose of accomplishing a goal (Oxford Online Dictionary, 2010).

¹ This concept of the 'managerial state' has been discussed by Clarke and Newman (1997), looking at public service transformation in social welfare in the United Kingdom.

Local officials handle different local demands and negotiate between the ‘embedded interests’ of other actors and stakeholders. ‘Embeddedness’ is a concept drawn from political sociology research which describes states as an integral part of their jurisdictions, which influences political decision-making and implementation through social and other interests of actors outside of the formal bureaucratic system. Peter Evans (1995) suggests that the delicate balance between autonomy and embeddedness is the key to government-business relations and successful economic development. A government should have roots in the society (‘embeddedness’) but, also has to have its own will and power (‘autonomy’). ‘Embedded interests’ refers to economic, political and social interests of societal actors. For example, local leaders might promote particularly policies which benefit certain industries under their local jurisdictions. In this paper, the embedded interests of local governments, and the relative autonomy of the national government from methanol fuel business interests, are used to explain the pro-active managerial behavior of local governments in the absence of strong national support. These interests provide incentives outside of the formal bureaucratic structure and motivate the local governments to promote methanol well beyond the limited national efforts that have been impeded by bureaucratic reforms and the political influences of Chinese oil majors. As national initiatives have been stalled by the dynamics of partial reform, local governments have emerged as important sources of innovation. The following case study on methanol fuel therefore analyzes the embedded interests, bureaucratic reforms, and political circumstances of Chinese national, provincial, and municipal level governments and the impacts of these influences on alternative automobile fuel regulation and development support.

3 Context: The Development of Methanol Fuel and Automobiles in China

There have so far been three phases of methanol fuel development in China. Development began with foreign joint ventures which facilitated technology transfer, moved to nationally-supported pilots, and has now reached pilots supported and arranged by sub-national governments. The following section aims to place the analysis into a historical context. It highlights the changing roles of different levels of the Chinese government.

3.1 Phase 1: 1980 – 2002 – Early development and Sino-American cooperation

The first phase was characterized by national domestic research and international cooperation. Methanol automobile fuel first received Chinese national attention in the early 1980s when the Chinese National Transport Ministry listed M15 (gasoline blended with 15 percent methanol) research as a national research project. The Chinese Academy of Sciences subsequently listed M85 (gasoline blended with 85 percent methanol) research in their key projects for the 7th Five Year Plan during 1986-1990 (Methanol Cooperation, 2006). In 1996, the Chinese Ministry of Technology and Science initiated a research project on methanol fuel, partnering with the Massachusetts Institute of Technology (MIT), Ford, Volkswagen, the Tsinghua University Department of Chemical Engineering, and the Chinese Academy of Sciences. Ford Motor Company donated a renovated engine and by the end of 1996, with the help of Ford engineers, the Shanxi Datong Automobile Factory was able to produce China’s first methanol

automobile. This cooperation led to a series of national methanol automobile projects which started in 1998 and continued through 2010.

3.2 Phase 2: 1998 – 2008 – National project emphasis

During the second phase, national ministries conducted pilots in selected areas in China and created incentives for using methanol fuels through toll fee reductions and tax allowances. The national emphasis spurred automobile development in several provinces. This was followed by the national government's near disappearance from methanol fuel development beginning in 2008.

This national level project emphasis phase began in 1998 when the Sino-American cooperation helped launch the Methanol Clean Fuel Pilot in Yuci, Shanxi, chosen as a pilot due to Shanxi province's coal-dependent resource base. The Shanxi Provincial Economic Commission coordinated the project and contracted a local company, Jiaxin, to convert engines of 50 city mini-buses to allow them to use M85. Buses traveled on routes between Yuci and Taiyuan, which are very close to each other, to limit the scope of methanol fuel distribution. As reimbursement for participating in the pilot, the participating buses were exempted from road tolls and the bus company received subsidies for each engine conversion. In 2005, the national government approved an '863' project which involved the engine conversions of 100 buses and 200 taxis.² Like the previous pilot project, bus and taxi drivers were exempted from road tolls and subsidized for engine conversions. This experiment continued through 2010. During this phase, large automobile manufacturers responded to these test projects and the national emphasis behind them and produced several models of flexible fuel vehicles (FFVs). These automobile manufacturers included large players like Anhui province's Chery, Shanghai Automobile Industry, and Chongqing's Chang'an Motors.

In addition to these national-level programs, specific leaders pushed forward overall methanol fuel development agendas. One deputy prime minister, Zeng Peiyan, especially emphasized the necessity of developing methanol fuel (Peng, 2008). Also, one national level minister, the former head of the Ministry of Machinery and Industry, He Guangyuan, was so adamant in his support that the Chinese media dubbed him the 'minister of methanol' (*jiachun buzhang* 甲醇部长). He Guangyuan and six other officials recommended methanol fuel projects to Hu Jintao and Wen Jiabao after their taking office in 2003. However, despite some ministers' strong support, methanol fuel development has received steadily decreasing national emphasis of late.

A gradual national de-emphasis on methanol projects began in 2008 notably for reasons related to the toxicity and concerns about the position and profitability of Sinopec. In 2008, the finance ministry discontinued national financial subsidies for engine conversions, and, with the exception of the 863 project which came to an end in 2010, the methanol car pilots became provincial projects. The road toll exemptions were also eliminated after many drivers received exemptions without actually using methanol fuel. In 2009, the National Development and Reform Commission (NDRC) postponed or indefinitely suspended 22 million tones/year of planned methanol capacity because of declining demand and margins (Chinese Chemical Information Service, 2010).

In 2010, the Ministry of Industry and Information (MII) announced its position that electric automobiles should be the main direction of the Chinese automobile industry. Their develop-

² China's National 863 Program offers financial support to foster technology innovation in China.

ment plan excludes methanol automobiles (Chemnet, 2010). A key shift also occurred in August 2010, when the chairman of Sinopec, Wang Tianpu, announced that Sinopec would not expand M15 sales to the rest of the Chinese automobile fuel market. Official reasons cited by Sinopec include toxicity concerns and methanol fuel's potential to disrupt Sinopec's stable and profitable gasoline business (Chen, 2010). Numerous interviewees confirmed the latter reason is of particular importance.³ The withdrawal of support from major oil companies will ultimately affect the ability to promote methanol fuel on a large scale, given the SOE's supply infrastructures and market dominance. One week after Sinopec's announcement, Shaanxi (note: Shaanxi is not Shanxi, both are separate provinces) postponed its plans to launch its methanol fuel strategy in October 2010.

3.3 Phase 3: Since 2006 –Sub-national promotion

In the third phase, given the absence of national M15 standards, other methanol policy documents or subsidies, some sub-national governments actively created and managed local methanol programs. Despite the national de-emphasis of methanol automobiles in 2010, provinces in Guizhou, Shaanxi, Shanxi, and Zhejiang set up provincial methanol offices to plan and promote methanol. Inner Mongolia, Hebei, Ningxia, Shandong, and Xinjiang are in the process of setting up offices and continue to show great interest in development methanol fuel.⁴ The majority of provinces such as Shaanxi, Shanxi have locally based coal production, but others, such as Zhejiang do not.

Among the different provincial governments, Shanxi has shown the most interest in methanol fuel business development. Tentative Shanxi provincial support began in 2002 when the Shanxi Economic Commission expanded methanol fuel pilot projects to four other municipalities in the province, Taiyuan (the provincial capital), Yangquan, Linfen, and Jincheng. The Shanxi Methanol office continuously negotiated with local companies, and, as a result, the scale of the initial pilots rose and expanded to other areas. The government then negotiated with Sinopec to provide low level blend methanol, M15, on a large scale. The government was able to win Sinopec's provincial branch as a partner in 2006 after local officials threatened to offer methanol fuel sales rights to local stations and, at least at first, condoned Sinopec's sales of cheap methanol blend fuel as normal 'No. 93' gasoline. The Shanxi provincial government also set up incentives to promote methanol. It offered engine conversion subsidies in 2008 and 2009, giving 5000 Yuan, or 50 percent of cost, for bus conversions and 1000 Yuan, or 20 percent of cost, for taxi conversions. After the road toll exemptions were eliminated in 2008, the Shanxi government exempted tax levies on M85 and M100. During this period, Jiaxin Company, a local private company contracted for both national and provincial pilots continued to receive preferential provincial subsidies, and preferential access to supply methanol to Taiyuan gasoline stations.

In addition to nationally and provincially-supported methanol car programs, municipal governments also fostered the development of home-grown engine conversion companies. One municipality in Shanxi in particular, Yuncheng, gave strong support to a small, privately-owned engine conversion enterprise, Beston, and achieved relative success in the promotion of M85 and M100 compatible automobiles. The municipal government did so by stepping in

³ Interview 25, July 2010, Shanxi Transportation Methanol Project Office; Interview 70, China Association of Alcohol and Ether Clean Fuels and Automobiles, September 2010.

⁴ Interview 70, China Association of Alcohol and Ether Clean Fuels and Automobiles, September 2010; Chemnet (2010).

during crisis situations, serving as a go-between for the enterprise and its suppliers, and also for the methanol enterprises and the provincial government. For example, during 2006, after Sinopec's entry into the market and unrelated international market disturbances, methanol fuel prices briefly rose to the point that methanol fuel became slightly more expensive than gasoline. In Yuncheng, the municipal Economic Commission convinced a local methanol producer to temporarily supply local methanol stations at reduced, but still profitable, prices to maintain methanol fuel's price advantage over gasoline, thus protecting the continued development of the local market.⁵ Drivers in other municipalities reverted their engines to their original settings during the brief price rise and refused to try the fuel again, even after prices returned to normal levels.⁶

The rapid changes beginning in 2008 during national reform are especially significant. After 2008, national support wanes and some local states step in to actively manage methanol fuel market development themselves. The next section summarizes the behaviors and embedded interests of government actors since the mid-2000s, drawn from both the political, economic, and environmental considerations of methanol fuel use. This is followed by an analysis highlighting the interconnectedness of interests and policy decisions, and the managerial, proactive behavior of sub-national governments.

4 Multi-Level Analysis of Governments and Interests

As described above, the national, provincial, and municipal levels managed regulation and support for methanol fuels differently. At the national level, the vested interests of the oil majors, Sinopec and Petrochina, worked against the formulation of effective bureaucratic regulation and management of methanol fuels. SOE influence was compounded by the shuffling of bureaucratic responsibilities during administrative reforms and the disorganization and confusion caused by it. The national de-emphasis can further be explained by a preference for experimental, long-term and non-redistributive policies, along with increasing national emphasis placed on reducing carbon emissions. Conversely, at the sub-national level, the embedded interests were sufficiently strong that provincial and municipal governments took on aggressive, managerial roles outside of the bureaucratic structure. This analysis thus argues that sub-national governments continued to effectively manage and actively promote methanol fuels despite the SOE interests and national level administrative confusion because of localities' embedded, non-bureaucratic interests.

⁵ Interview 43, Methanol Engine Conversion Company, July 2010.

⁶ Interview 38 and 39, July 2010, Yuncheng Economic Commission; Interview 43, Methanol Engine Conversion Company, July 2010.

Table 1. A Multi-layered government level analysis- Factors influencing methanol policy outcomes			
Government Level	Perspectives		Other factors influencing policy outcomes
	Benefits	Disadvantages	
National: De-emphasis of methanol fuel	<ul style="list-style-type: none"> • Energy security • Short-term SOE profits (when selling methanol as normal fuel), • Long-term ‘clean’ potential when made from CO₂ or biomass 	<ul style="list-style-type: none"> • GHG emissions (climate change, carbon intensity targets) • Competition for major SOEs (long-term profits, market destabilization), toxicity • Low acceptance, price fluctuations 	<ul style="list-style-type: none"> • Reform and Bureaucratic Restructuring • Preference for long-term, experimental energy development such as electric cars
Provincial: Variation-selective support	<ul style="list-style-type: none"> • Market expansion and diversification for coal and fertilizer ent., improved air visibility, less local air pollution (Shanxi priorities, esp.) 	<ul style="list-style-type: none"> • Toxicity, low acceptance, price fluctuation 	<ul style="list-style-type: none"> • Government-enterprise partnerships
Municipal Variation – selective support	<ul style="list-style-type: none"> • Market expansion for local fertilizer enterprises, improved air visibility and less local air pollution 	<ul style="list-style-type: none"> • Toxicity, low acceptance, price fluctuation 	<ul style="list-style-type: none"> • ‘Pet projects’ (leadership emphasis), government-enterprise partnerships, ‘social stability’ (protests)

Source: Based on interviews 25, 43, 51, 51, 53, and 70 with multiple provincial and municipal-level energy conservation offices and methanol offices, the Shanxi Transportation Methanol Project Office, Beston Automobile Conversion Company, Jinzhong Jiaxin Automobile Conversion Company, Huadun Methanol Production Company, and China Association of Alcohol and Ether Clean Fuels and Automobiles during July to October 2010.

4.1 National level: Experimentation with pilots, SOE interests, bureaucratic restructuring, and long-term strategy

Methanol fuel received strong national support from the 1980s through 2008. The central government emphasized the early research and development of methanol fuel and automobiles, and set up pilot projects to test their use. National ministries and universities cooperated with foreign partners, facilitating technology transfer and domestic production. Also, the government, with the help of the oil majors, created standards for high level blend M85 and M100 methanol fuels. Yet, since 2008, this support has stalled. National engine conversion subsidies, pilot projects, and road toll exemptions were discontinued or passed to provincial governments. Sinopec, which realized significant profits from M15 sales, withdrew from the market in 2010 and delayed the formulation of M15 fuel standards. Also in 2010, methanol fuel was excluded from the development plan of the Ministry of Industry and Information. These actions could be considered a natural and calculated withdrawal, given that young industries must at some point prove their competitiveness and ability to survive without government support, but the sudden and unexpected withdrawals over the past two years seem to contradict this, reflecting a sudden shift in policy focus as opposed to a more gradual withdrawal.

The following analysis argues that the national government's benefits from promoting methanol fuel, including energy security and the long-term potential from clean forms of methanol, were not enough to overcome (a) the opposition of state oil majors due to low level blend methanol's potential to profitability and gasoline market share concerns, (b) the mismanagement and emerging policy gap during bureaucratic restructuring, and (c) national preferences for long-term and experimental energy development plans, including those related to reducing carbon emissions.

(a) Opposition of state oil majors

The first explanation for the limited national support and the recent de-emphasis is that central government officials are exposed to the business interests of Chinese oil majors, who had numerous reasons for opposing the widespread use of methanol fuel. Sinopec was asked by the central officials to take the lead in methanol fuel development and methanol standard creation, but delayed progress to protect their own business interests. Sinopec willingly created standards for high-blend methanol fuels such as M100 and M85 that not threaten Sinopec's gasoline business because using such high blended fuels requires engine conversions. However, the SOE reportedly impeded the development of M15 fuel standards and M15 fueling stations, because low blended fuels can be used with existing engines and methanol fuel would stand in direct competition to Sinopec's and Petrochina gasoline sales. This is because domestic producers have a large methanol production capacity, and given that private gasoline stations could establish a sufficient supply network, Sinopec and Petrochina would experience strong domestic competition.

In addition to this, although Sinopec was able to sell the M15 fuel as normal No. 93 gasoline for several years and achieved large profit margins, it was forced to correctly label the fuel after complaints from the public. Sinopec's 'M15' fuel prices reflected the addition of cheap methanol fuel, lowering profit margins and partially removing one of the primary incentives for the SOE to sell methanol. Also, if Sinopec had expanded its sales of M15 fuel, they would have potentially destabilized Sinopec's and Petrochina's relatively stable gasoline market.

Methanol prices at times fluctuate widely and are heavily sensitive to international market disturbances.

(b) Periodic restructuring of China's energy bureaucracy

The SOEs' opposition hindering market development was reinforced by bureaucratic turmoil and turf fights at the national level due to frequent restructuring of China's energy bureaucracy throughout the 2000s. Agencies in charge of methanol were not clearly appointed or lacked the authority, autonomy, and tools to govern the energy and fuel markets. As a result of the ongoing bureaucratic restructuring during the mid-2000s, a significant methanol policy gap emerged that deprived the methanol fuel market of central government management and coordination. For example, prior to the energy bureaucracy reforms in 2008, the NDRC drafted a policy file on methanol fuel and gathered opinions from different government departments and market actors, but this policy failed when bureaucratic responsibilities for the fuel were reassigned from the NDRC's Energy Bureau to the newly formed National Energy Administration (NEA). The failure of the initial draft policy was in part caused by an ongoing transition period during which new policy managers adapted to their responsibilities.⁷ Beyond this, although the NEA was better staffed than the NDRC Energy Bureau, there were only 112 employees working at the national level, far fewer than needed. By comparison, the United States Department of Energy has around 4,000 employees working on energy issues (Downs, 2008b). Also, the NEA was intended to resolve planning and coordination issues, yet it lacked the power to carry out many of its assigned tasks, lacking the authority to effectively coordinate the interests of ministries, commissions, and state-owned energy companies (Downs, 2008b). To improve coordination, a National Energy Commission (NEC) was set up with more than 21 members that ranked at a higher level than both NDRC and the National Energy Bureau in the hierarchy of power, but there was a considerable time lag before the new ministry started to operate. Throughout 2009, negotiations among key department leaders took place to agree on the so-called 'super ministry's' core leadership and tasks. Official NEC appointments were made only in January 2010 (Wan, 2010) and following up to the creation of 'super ministry' for energy, power struggles among different departments resulted in no clear lines of responsibilities and accountabilities. While in some areas there was significant double work among agencies to fight for territory, in other areas issues simply fell 'fell through the grid'. Methanol fuels were one example of the latter.

(c) Long-term energy development plans

In addition to the impacts of SOE's declining interests in methanol and periodic restructurings of China's energy bureaucracy, the overall preferences of the national government likewise influenced methanol fuel policy. The central government's withdrawal from the methanol fuel market corresponds with increasing promotion of electric cars and other long-term, non-fossil fuel options. This trend indicates a more long-term view of energy development, under the premise that enduring energy security and climate change mitigation efforts depend on decreased use of fossil fuels and increased reliance on renewable sources. This long-term approach to energy development is underscored by the central government's strengthened commitment to ambitious carbon intensity reductions by 2020, aiming to reduce carbon intensity by 40-45 percent based on 2005 levels. This in particular has important implications for methanol fuel because one the most attractive aspects of methanol is that it can be produced

⁷ Interview 70, China Association of Alcohol and Ether Clean Fuels and Automobiles, September 2010.

from China's abundant coal resources, yet greenhouse gas emissions from coal-based methanol are twice those of gasoline. Methanol fuel has many benefits, including low cost and lower emissions of some local air pollutants than gasoline, but it does not have the many clear potential advantages for emissions and energy security that electric cars would possess. Given China's politically powerful and relatively autonomous state-owned oil companies, combined with the existence of inter-departmental fragmentation in energy, it is difficult for the national bureaucracy to micro-manage policies which involve redistribution and drawbacks or do not impact core interests. According to Kong (2009), adopting and implementing redistributive policies at the national level in China is becoming increasingly difficult. National level decision-making on methanol fuel promotion is no exception, especially during institutional reform and transition. Ultimately, national promotion of methanol fuels in the late 1990s and early 2000s was primarily experimentation-oriented, and no recent concrete steps were taken by national government actors which threatened oil companies' interests or which would have been redistributive and difficult to implement within the formal bureaucratic structure. Without SOEs' support for methanol fuel switching, and as the central government's stand towards methanol business development gradually shifted from coordinated national support towards no direct policy, support for low level blend methanol fuels was eventually left up to the provinces.

4.2 Provincial level: Embedded economic interests, short-term strategies, and pollution considerations

Several provincial governments, including Shanxi province, have continued to support methanol fuel, despite the recent national level withdrawal. Significantly and in contrast to government inaction at the national level, provincial officials took aggressive steps to promote methanol, employing methods outside of the formal bureaucracy that were unaffected by the national reforms. For example, provincial leaders in Shanxi and Guizhou with embedded interests to promote methanol fuel exercised their political muscle and actively managed opposition from oil majors.⁸ Opposition from Sinopec in Shanxi was countered by threats and unofficial deals not granted to local suppliers that allowed Sinopec to reap significant profits from methanol sales. Also, Shanxi officials created methanol promotion offices, actively planned the methanol engine conversion pilots, and formed closed alliances with local companies, negotiating pilot expansions and distribution rights with them. As pilots expanded, establishing a M15 standard became increasingly necessary with many small producers entering the market, but there was no national action due to opposition from Sinopec. Shanxi, like eight other provinces, responded by developing its own provincial standard. It did so with the help of the local Huadun Company.⁹

In addition to planning, coordinating, and forming alliances, government officials also sought to persuade stakeholders and decision-makers to buy in to methanol fuel through *framing* the coal-based methanol fuel as a clean, cheap, and locally beneficial alternative to imported gasoline.¹⁰ This is despite the fact that Sinopec was allowed to sell M15 fuel at the same cost

⁸ Interview 70, China Association of Alcohol and Ether Clean Fuels and Automobiles, September 2010.

⁹ Interview 52, Huadun Methanol Fuel Company, July 2010.

¹⁰ The concept of 'framing' originates from sociological research (Goffman, 1974) Frame analysis has been applied to the politics of environmental, energy, and climate change discourse and describes the effectiveness of linguistic 'reframing' of policies in dominating public perceptions of issues (Hajer, 1995, Scrase and Ockwell, 2010).

as gasoline, taking away the cost advantage for consumers, and also that methanol fuel is clean in terms of local pollutants but ‘dirty’ with respect to carbon emissions. Framing coal-based methanol as a clean fuel provided provincial leaders an extra rationale for steps taken against some national interests, protecting provincial action from the disapproval from the central government.

Two explanations help to explain provincial government’s aggressive, managerial support of methanol fuel: (a) a more short-term and localized view of energy development prioritizing economic benefits for local coal and fertilizer enterprises, and (b) local, visible pollution reduction benefits from the use of methanol which was especially important to provinces with national government and international media pressure to reduce air pollutants. Both economic interests and environmental concerns at the local level in some provinces outweighed the difficulties of promoting the fuel. Hence, these provincial governments were especially willing to continue support despite the shuffling of responsibilities which occurred during the bureaucratic restructuring and reform.

(a) Economic interests and a localized view of energy development

In terms of local economic interests in Shanxi, methanol fuel benefits primarily local coal and fertilizer industries, and methanol promotion policies do not negatively influence core business interests. For example, Shanxi as the second largest coal producer in China, favors the development and diversification of coal markets. Especially with new demands beginning in 2006 to increase GDP per unit of standard coal equivalent, the Shanxi provincial government faces pressure to increase the value-added of products manufactured from coal in the province. Methanol fuel profit margins are high and through the use of coal-based methanol fuel, the province can keep more profits within its borders. Also, the expansion of the methanol market has significant benefits for fertilizer companies as methanol fuel diversifies their product base and grants them greater market stability. In addition to embedded business interests, a thriving local methanol fuel business helps provincial government officials to meet their economic growth and employment targets. Although cadre evaluations include environmental and energy targets, economic growth is perhaps still one of the safest bets for cadres chasing promotions.

These economic interests are pressing and lead to short-term methanol promotion strategies. Unlike the long-term development of electric cars supported by the national level, methanol fuel is technologically within China’s grasp, and promotion of the fuel results in short-term, relatively immediate results for businesses and the economy. While the national level has few of these short-term incentives because of the many different provinces, most of which do not have the significant economic interests in methanol that coal provinces have, and is instead influenced by the interests of national oil majors, individual provinces can be strongly motivated to create short-term strategies to resolve the lack of management of the methanol industry by the national level.

(b) Pollution considerations

Pollution considerations also influenced Shanxi Provincial Government’s policy choice. Beginning in 2006 and continuing through the present, Shanxi has faced national and international media scrutiny on its air pollution. In 2006, the World Bank listed one of its municipalities as the world’s most polluted city (Chang, 2009). Methanol fuel may produce greenhouse gas emissions far greater than gasoline, but at the local level, it improves air quality and can result in less smog because of its emissions relative lack of atmospheric reactivity. For Shanxi

and other provincial leaders, there is perhaps a slight preference for air quality improvement programs with greater visibility to the general public, including the smog factor, especially as local Environmental Protection Bureaus (EPB)'s keep track of 'blue sky' days.¹¹ It is more obvious to the public that the government is 'doing something' and this is arguably of paramount importance to a government facing local, national, and international media pressure.

4.3 Municipal level: Local economic interests, government-business coalitions, and 'pet projects'

As at the provincial level, municipal government behavior on methanol promotion can be aggressive and managerial. The case study on Shanxi's Yuncheng municipality illustrates a municipal government's intervention and negotiation to protect the development of the methanol fuel market. The Economic Commission promoted and strengthened existing companies, supported petitioning to upper governments for additional funding, and intervened in at the moment of crisis by ensuring re-stabilization of prices. The managerial behavior of the government actors can be explained by embedded economics interests and the personal involvement of individual leaders, particularly individual leaders who took on methanol promotion as a 'pet project'.

In Yuncheng municipality, the local privately-owned Beston Company was originally an automobile repair shop, and in 2005 was working on engine conversions for liquefied oil gas at the time. Its entrance into the methanol engine conversion market was a combination of two distinct events. The first event was that in 2005 and 2006 the provincially supported Jiaxin Company had just undertaken the widespread promotion of its engine conversions, yet had run into serious technology issues. Beston saw the difficulties as an opportunity to enter the market. The second event was an alliance between the repair shop manager and an official in Yuncheng's Municipal Economic Commission. The two men were introduced through a classmate of the repair shop manager who had heard that the government official was interested in supporting the development of methanol fuel usage in the municipality. They developed a strong partnership and repeatedly petitioned the provincial government for financial support, eventually receiving an Environmental Protection Fund grant amounting to 200000 RMB.¹²

Over time, the enterprise and the economic commission, through the government official, developed a strong partnership. For example, while petitioning for subsidies, the official's support made it clear that Beston Company was not to be considered 'outside' the government, but in partnership with it. However, not all companies had this support from the 'managerial state', and in one locality this had a significant impact on the outcome of petitioning and protest there. One enterprise manager protested when his company did not receive promised subsidies. The result was that he was jailed for several days as he petitioned as an 'outsider' without government endorsement. He eventually gave up his petition. The Yuncheng Economic Commission support, in the form of a personal commitment from one of its high-ranking officials, was not limited to petition assistance, but also included negotiation and intervention during one major methanol price fluctuation, assistance that, according to the company, saved the methanol automobile market in the municipality. In 2006, after Sinopec's entrance into the market and international market disturbances, methanol fuel prices rose to

¹¹ Interview No. 7, July 2010, Shanxi Province Environmental Protection Bureau.

¹² Interview 38, July 2010, Yuncheng Economic Commission.

the point that the fuel became more expensive than ordinary gasoline, eliminating incentives for consumers to switch to methanol fuel. Taxi drivers protested, believing that they had been cheated. In response, and to protect the methanol automobile industry and Beston Company, who was taking the brunt of the public anger, the official from the economic commission negotiated a deal with a local fertilizer plant, under which the fertilizer plant supplied methanol at a reduced price to methanol gas stations. The drivers were placated and kept methanol engine conversions. This was essential to the successful promotion of methanol in Yuncheng because local car drivers new to the fuel had been uneasy about using a non-gasoline alternative.¹³ In other localities, the price rises resulted in drivers switching back to normal gasoline and being unwilling try the fuel again.

In Shanxi, municipal embedded economic interests that support methanol fuel are in line with those at the provincial level. Almost all municipalities have significant coal resources and fertilizer enterprises. Because of this, many municipalities have incentives to promote methanol similar to provincial incentives. Yuncheng, notably, does not have coal resources, but has many large fertilizer enterprises due to its proximity to coal-producing locations, and its importance as a provincial agricultural base. This is significant as the fertilizer enterprises benefit the most, more than coal interests, from methanol promotion in the short-term since they sell methanol directly to the market and diversify their consumer markets. These short-term benefits, or the short-term economic consequences of market stability once promotion of methanol has achieved a degree of success, create additional pressure to find short-term, reactive solutions to pressing market development issues.

Also, at the municipal level, government support for methanol can be tied to individual preferences of leaders than at either the national or provincial level. This leads to large variations in support for methanol fuel among municipals. For example, promotion in Yuncheng was especially interventionist, aggressive, and, ultimately, successful. The deciding factor in this was the government-business coalition and the enthusiasm of the economic commission official who took promotion and protection of the methanol industry on as a 'pet project'. This official had existing close connections to a large, profitable fertilizer enterprise and good relationships with provincial government officials. In addition, the existence of a independently successful local engine conversion company capable of competing with the dominant, provincially-supported Jiaxin made it easier to justify support. The company was able to provide high quality engine conversion products while Jiaxin correct product malfunctions in 2005. In this way, the municipal level government support and the local enterprise complemented provincial efforts and created increased market competition.

¹³ Methanol is acidic, wearing away the fuel lines of cars without appropriate equipment to handle the fuel, and many consumers believe it to be highly toxic. It is also sometimes hard to start a car running on the mixed methanol fuel in cold conditions.

5 Conclusion

This paper has argued that the embedded interests of local governments, ongoing bureaucratic reforms and the rising political influence of Chinese oil majors at the national level account for the pro-active managerial behavior of local governments in the absence of strong national support. Local embedded interests range from economic business interests to local pollution concerns and provide incentives outside of the formal bureaucratic structure that serve to motivate the local governments to promote methanol well beyond the limited national efforts. The attractiveness of methanol automobile fuel at the sub-national level is partly due to the enthusiasm of fertilizer producers in the jurisdictions who would like to diversify their consumer base and provide alternative markets during methanol price fluctuations. The embedded interests of local businesses were strong enough to motivate sub-national governments to take on managerial roles independently of specific national oversight or policies. This ‘local managerialism’ was crucial to the continued support of methanol fuel during reforms of the national bureaucratic institutions, especially from 2008 through 2010, and as SOE’s stalled government regulation and planning.

The multi-level case study of Shanxi province highlighted numerous managerial methods employed by local officials. In the absence of well-defined and appropriate central directives, local governments increasingly act in an ad-hoc managerial and problem-solving capacity, handling the competing local demands and interests by forming and enabling local linkages with business to advance their goals. Officials went so far as to threaten to allow independent, local providers to encroach on the SOE’s consumer markets if they did not supply low level blend methanol fuel. At the municipal level, local cadres exercised hands-on management and intervention, including inter-enterprise negotiations and representation of methanol interests to higher governments, which served to protect the methanol fuel industry during crisis. These actions by provincial and municipal governments were in addition to the provincial methanol fuel subsidies beyond those offered by the national government, and provincial M15 standards (i.e., standards for fuel blended with 15 percent methanol). These provincial standards were in direct response to Sinopec’s strategic inaction on creating standards for low level blend methanol fuels.

To place this analysis in a larger context, despite the ongoing bureaucratic restructuring at the central level and the growing influence of state-owned oil majors now capable of pushing their agendas on the central level policies, as evidenced by the delay of M15 standardization, local governments are not necessarily paralyzed by a national policy vacuum. In contrast, provincial and municipal governments display the ability to support and manage the development of markets beneficial to their embedded interests regardless of the state of affairs above them in the bureaucratic hierarchy. While the national government concentrates on and selectively pursues experimental, long-term strategies to energy security, research, and market development, such as that for electric cars, leaders at the sub-national level are often able to act to create short-term, ad-hoc solutions to the pressing issues surrounding strategic markets, which in this case were those for methanol fuel and engine conversions. These short-term solutions differ from the policy actions on methanol by national actors in that local actors actively plan, organize, manage, and negotiate the terms of the market according to the determinants embedded local interests, a degree of focus and decisiveness that was beyond the capacity of the national level.

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