

A Casualty of Political Transformation? The Politics of Energy Efficiency in the Japanese Transportation Sector

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*The Democratic Party of Japan (DPJ) came to power in 2009 promising significant transportation sector reform, but it has struggled to implement its proposals. I argue that the DPJ's initiatives faltered due to the legacy of "efficiency clientelism." Historically, Japanese transportation policy combined two imperatives: (1) encourage efficiency by raising the cost of energy-inefficient transportation, and (2) redistribute benefits to supporters of the incumbent Liberal Democratic Party (LDP). Because of the legacy of efficiency clientelism, DPJ campaign pledges—designed to appeal broadly to the general public by reducing transportation costs—ran up against the prospect of sharp declines in revenues and energy efficiency. Efficiency clientelism was well suited to political realities in Japan prior to the 1990s, but recent developments have undercut its viability. This raises profound questions about the sustainability of Japan's energy efficiency achievements. **KEYWORDS:** Japan, Japanese politics, energy policy, energy efficiency, transportation, gasoline, highways, elections, electoral reform, Democratic Party of Japan*

SINCE THE EARLY 2000S, THE DEMOCRATIC PARTY OF JAPAN (DPJ) HAS placed heavy emphasis on transportation sector reform. In its first campaign manifesto, published in preparation for the 2003 lower house election, the DPJ proposed to eliminate highway tolls, abolish government funds earmarked for road construction, and drastically reduce taxes related to automobile ownership (Democratic Party of Japan 2003). The 169th Diet session held in 2008 became known as Gasoline Kokkai (gasoline Diet), as the DPJ maneuvered aggressively for a reduction of the gasoline tax.¹ The DPJ came to power in 2009 campaigning on a platform that heavily emphasized transportation sector reform—for example, in the 2009 DPJ manifesto, measures related to transportation constituted 23 percent of projected costs associated with policy proposals through FY 2013, second only to the child allowance, which accounted for 49 percent.²

In light of the DPJ's enthusiasm for transportation reform as a minority party, it is striking how little change occurred once the party came to power. The gasoline tax, the subject of a heated showdown with the LDP in 2008, has been retained in all but name, replaced with a CO₂ tax that leaves gasoline prices virtually unchanged. Plans to eliminate highway tolls were scaled back dramatically, with selective reductions occurring in 2010 on an experimental basis, followed by cancellation of the program in 2011 in order to raise revenues for reconstruction following the Tohoku earthquake.³ Plans to eliminate various taxes associated with automobile ownership were reconsidered, with the automobile acquisition tax retained at status quo levels and the weight tax reduced modestly.⁴

What accounts for this puzzling pattern of DPJ policymaking in the transportation sector? Popular and media accounts have mostly focused on factors such as lack of leadership and the shortcomings of key individuals such as Hatoyama Yukio, Maehara Seiji, and Ozawa Ichiro.⁵ Such factors undoubtedly played a role in muddling the decisionmaking process of the DPJ once in office. However, in this article, I analyze the DPJ's transportation policies from a broader perspective, focusing on political changes over the past two decades (Lipsy and Scheiner 2012) and historical patterns of Japanese transportation policymaking.

More specifically, I argue that Japanese efficiency policies in the post-oil shocks period often followed a predictable pattern, which I call *efficiency clientelism*. Efficiency clientelism coupled the achievement of energy efficiency goals—an important national prerogative for Japan after the 1970s oil shocks—with the political survival of the Liberal Democratic Party (LDP). Policies were implemented consistent with two outcomes: (1) impose diffuse costs on the general population in the direction of encouraging greater energy conservation or energy efficiency, and (2) redistribute the revenues or economic rents attributable to higher costs in order to benefit narrow, organized supporters of ruling politicians.

Efficiency clientelism was effective precisely because of the symbiosis between energy efficiency goals and Japan's postwar political arrangements—an electoral system that encouraged particularism over broad, public appeal (Rosenbluth 1989; Sakakibara 1991; Ramseyer and Rosenbluth 1993; McCubbins and Rosenbluth 1995; Scheiner 2005), LDP one-party dominance, and an elite bureaucracy with considerable autonomy and agenda-setting power (Johnson 1982; Okimoto 1990). However, these elements of postwar Japanese politics have weakened over the past two decades. Electoral reform in 1994 shifted the incentives of politicians from narrow targeting of interest groups toward broad, public appeal (Cox, Rosenbluth, and Thies 1999; Hirano 2006; Rosenbluth et al. 2009; McElwain 2012; Scheiner 2012). This has made it in-

creasingly difficult to justify policies that generously benefited narrow groups such as rural residents and infrastructure-related industries at the expense of the general transportation user. The bureaucracy, which has played an important role in designing and implementing energy efficiency measures, has been severely delegitimized by repeated scandals (Pharr 2000; Ozeki 2009), and administrative reforms have gradually shifted power in favor of politicians. Finally, the DPJ emerged as a serious, credible competitor of the LDP and finally took over the reins of power in 2009 (McElwain 2012). In effect, important underpinnings of Japanese energy efficiency in the transportation sector have been undermined by political changes over the past two decades.

Ironically, the elements that made efficiency clientelism effective prior to political transformation also became a liability as the DPJ gained power. As a minority party, the DPJ targeted its message to Japan's new electoral realities by adopting policy positions designed to appeal broadly to the general public. In the transportation sector, this meant attacking traditional mechanisms that raised costs and delivered benefits to core LDP supporters. However, once in power, the DPJ was confounded by the "efficiency" dimension of efficiency clientelism—dismantling status quo policy arrangements in the transportation sector would lead to a sharp deterioration in energy efficiency. This dilemma put the DPJ in an awkward position. On the one hand, the DPJ has appealed to the environmentalist sensibilities of its urban support base by advocating steep reductions in CO₂ emissions. On the other hand, policy measures such as elimination of highway tolls and gasoline taxes would lead to greater transportation activity and fossil fuel consumption, increasing pollution and emissions.⁶ This conundrum forced the DPJ to scale back and ultimately abandon its core policy objectives in the transportation sector.

DPJ transportation policymaking has been constrained by two additional factors attributable to the evolution of Japanese politics over the past two decades (Lipsky and Scheiner 2012). First, in recent years, the policy positions of the LDP and DPJ have moved toward convergence, motivated by an electoral system that emphasizes the preference of the median voter (Scheiner 2012; McElwain 2012). By the time the DPJ came to power, LDP reformists had partially implemented several of the DPJ's transportation initiatives, eliminating some low-hanging fruit and limiting the scope of DPJ reform once in office. Particularly important was the 2008 decision by LDP prime minister Fukuda Takeo to transfer transportation revenues from the Road Improvement Special Account to the general account budget. This severed the explicit connection between transportation taxes and redistribution to traditional LDP supporters—any reduction in transportation taxes under a DPJ government would di-

rectly impact general revenues. Consequently, the DPJ's transportation reform initiatives encountered strong intraparty resistance from budget hawks and the Ministry of Finance.

Second, each major party in Japan remains internally divided due to disincentives against switching parties (Scheiner 2012), and organized, particularly local, interest groups continue to exert important influence over national-level policymaking vis-à-vis both parties (Shimizu 2012). As I discuss in this article, the DPJ's plans for highway tolls came under heavy intraparty contestation during the implementation process, not only from budget hawks, but also from politicians closely tied to labor unions of alternative transportation industries. These groups feared the adverse effects of cost advantages gained by automobile transportation. The DPJ's highway toll plan was modified repeatedly to accommodate such interests.

I proceed in my discussion as follows. In the next section, I present an overview of Japan's energy efficiency policies and place them in historical and cross-national context. In particular, I illustrate that Japan's energy profile in the transportation sector stands out from its international peers. I then characterize the historical pattern of policymaking in Japan vis-à-vis transportation energy efficiency, which I call efficiency clientelism. A set of case studies follows, illustrating how efficiency clientelism promoted energy efficiency in Japan's transportation sector. I then discuss the DPJ's transportation policies in light of this historical context and political changes over the past two decades. I conclude with a discussion of the implications of this study for the future of energy efficiency policymaking in Japan.

Japanese Energy Efficiency in Comparative Perspective

Since the oil shocks of the 1970s, Japan has been a global leader in energy efficiency. Japan's economy is extremely energy efficient based on a variety of measures such as energy intensity and CO₂ intensity, and Japanese energy efficient technologies are among the most advanced in the world (Barrett and Therivel 1991; Barrett 2005). Cooperation on energy efficiency has also been a major Japanese foreign policy objective. Japan has leveraged its strong record on energy efficiency by, among other things, taking an active role in facilitating international agreement on the Kyoto Protocol restricting CO₂ emissions and promoting energy efficiency as a major component of its foreign aid program (Tanabe 1999; Seki 2002; Hamanaka 2006; Oki 2007; Ministry of the Environment 2007).

However, to date, the politics of Japanese energy efficiency has been an underexplored topic. Most existing accounts of Japanese policymak-

ing in this area have focused on either energy security issues (Eguchi 1980; Samuels 1983; Nemetz, Vertinsky, and Vertinsky 1985; Kim and Shin 1986; Bobrow and Kudrle 1987; Samuels 1987; Hein 1990) or on broader environmental policy (Simcock 1974; McKean 1981; Reed 1981; Iijima 1984; Reich 1984; Broadbent 1998; Tsuru 2000; Funabashi 2006; Miyauchi 2006; Nakazawa 2006; Terao and Otsuka 2007). Those analyses that do deal explicitly with energy efficiency tend to be descriptive in nature and focus on technical and engineering aspects of the issue rather than political and policymaking processes (Nagata 1993; Kasahara et al. 2005; Ministry of Economy, Trade, and Industry [Japan] 2007; Wicaksono 2008; International Energy Agency, various years; Kiang and Schipper 1996).

Because energy efficiency is a multifaceted issue spanning multiple sectors, it is affected by a range of factors. It is worth emphasizing at the outset that I am not claiming that the theoretical account that follows is the only mechanism that has contributed to energy efficiency in Japan, or even the most important one. Many factors account for Japan's relative efficiency, and several important policy initiatives fall outside the scope of this analysis. For example, Japan's stringent fuel economy standards owe a great deal to the interests of domestic automobile firms, which specialize in fuel efficient automobiles and are therefore relatively supportive of strong regulatory standards compared to automobile firms in other countries. Close, frequent, and informal consultation between bureaucrats and private sector actors allows for realistic regulatory measures that may be more difficult to implement in legalistic societies such as the United States (Lipsky 2009).

In addition, some factors unrelated to politics are also important contributors to Japanese energy efficiency (Kiang and Schipper 1996). For example, Japan's geography plays a role in making energy conservation measures feasible; with densely populated urban centers in relatively close proximity to each other, Japan is much more suited to high-speed rail transportation than more sprawling countries such as the United States or Canada.⁷ Japan's climate is also relatively temperate, which implies less energy used for heating and cooling than Russia or Singapore. Some observers also point to Japanese culture, which has purported advantages such as being more frugal, collectivist, or in tune with nature.⁸

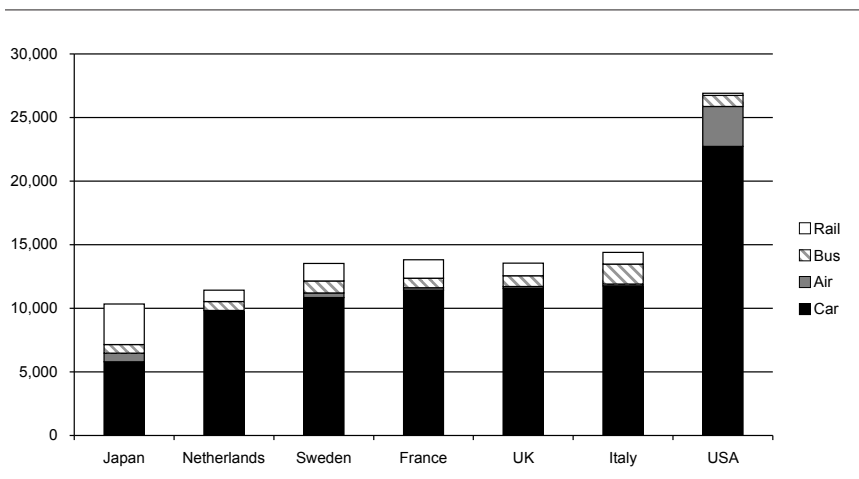
In this article, I focus on energy efficiency in the transportation sector for several reasons. First, transportation reform has been a key policy platform of the DPJ and, more broadly, a major source of contention in Japanese politics in recent years. Second, because of the complex, multifaceted nature of energy efficiency, limiting the analysis to a single sector makes

it more feasible to gather in-depth information from relevant databases and policymakers. Third, Japan clearly stands out in transportation sector energy efficiency in several respects. The Japanese government often promotes the fact that Japan has maintained the most stringent fuel economy standards and consequently has the most fuel efficient automobile fleet of any developed economy. However, Japan is somewhat weaker in actual, realized automobile energy efficiency due to greater traffic congestion compared to other countries (Lipsy and Schipper 2012).

Where Japan truly stands out is in aggregate distances traveled and transportation mode share (see Figure 1).⁹ Compared to other developed countries, a far greater percentage of Japanese transportation is accounted for by rail, which is generally the most energy efficient mode of transportation currently available.¹⁰ On a per capita basis, automobiles account for a much lower share of passenger kilometers in Japan, even compared to countries with similar geographic and demographic characteristics. In addition, Japanese citizens travel shorter distances compared to their international peers. As Figure 1 shows, on a per capita, annualized basis, Japanese travel about 25 percent less than the French and 62 percent less than Americans.

There are good reasons to suspect these transportation outcomes are at least partially a consequence of government policies. As illustrated in Tables 1 and 2, highway tolls and taxation of automobiles in Japan have

Figure 1 Passenger Kilometers per Capita by Travel Mode, 2007



Sources: Various national sources.

Table 1 Highway Tolls, 2002

	Japan	France	Italy	United States	United Kingdom	Germany
Toll highways (as a percentage of total)	100	74.8	86.2	8.9	0	0
Average toll (US\$/km)	\$0.21	\$0.07	\$0.05	n/a	n/a	n/a ^a

Source: Japan Public Highway Corporation.

Note: a. Germany started imposing a toll only on trucks, equivalent to \$0.12/km, in 2005.

Table 2 Automobile Taxation, 2002

	Japan	United Kingdom	France	Germany	United States
Tax per automobile (US\$)	\$5,800	\$4,700	\$3,750	\$3,300	\$1,500

Source: Japan Automobile Manufacturers Association.

Note: Assumes ownership for nine years, with the following vehicle characteristics: 1800cc, 1100kg, purchase price of 1.8 million yen.

been maintained at extremely high levels compared to other states. Travel is generally expensive in Japan regardless of mode share, and among modes, automobile travel is particularly costly in comparison to other developed economies. Naturally, this imposes both an income effect (less total travel) and a substitution effect (opting for nonautomobile travel) on the Japanese traveler. In sum, although factors such as geography and culture may make Japan particularly suited to energy conservation, government policies also stack the decks in favor of short travel distances and away from automobile transportation. The following section lays out my theoretical perspective on how Japanese political arrangements have facilitated this transportation profile.

Efficiency Clientelism in Japan

One important element of Japanese energy efficiency policy that emerged after the 1970s oil shocks was what I call efficiency clientelism. In this section, I describe efficiency clientelism and how it contributed to the

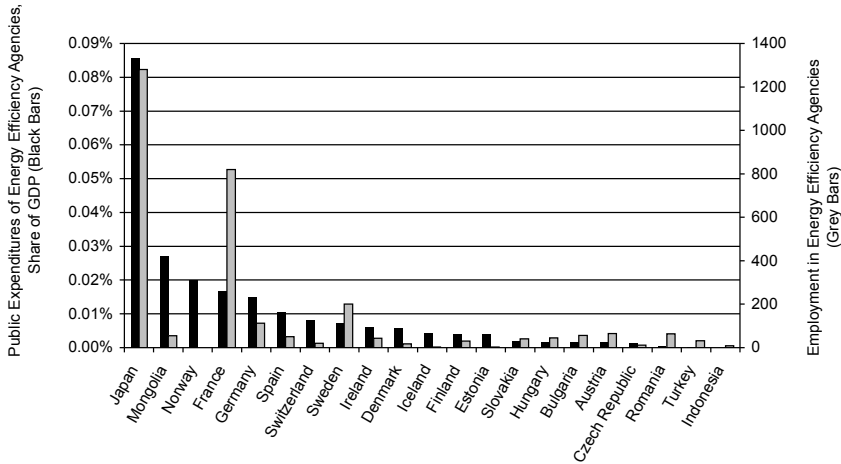
maintenance of overall energy efficiency in Japan. To be effective and sustainable, any policy measure promoting energy efficiency must be compatible with the political realities of the country in which it is implemented. Under efficiency clientelism, a policy measure has two principal effects: (1) to impose diffuse costs on the general population in the direction of encouraging greater energy conservation or energy efficiency, and (2) to redistribute the revenues or economic rents attributable to higher costs to benefit narrow, organized supporters of ruling politicians.

The first element of efficiency clientelism stems from Japan's experience in the 1970s oil shocks, which highlighted the country's dependence on foreign energy sources and consequent economic vulnerability. Japan's response was shaped by its political institutions, characterized by close cooperation between an elite bureaucracy, politicians, and private sector actors (Johnson 1982; Samuels 1987; Okimoto 1990). Energy efficiency emerged as a centerpiece of Japan's response.¹¹ In recent years, an additional motivation has been provided by environmental concerns and Japan's international treaty obligations concerning CO₂ emissions reductions.

In the transportation sector, the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) has been primarily responsible for developing efficiency policies in coordination with the Ministry of Economy, Trade, and Industry (METI) and the Ministry of the Environment (MOE).¹² Since the 1970s, these bureaucracies have acted as important advocates for energy efficiency within the Japanese government, and bureaucrats have steered policy outcomes toward efficiency through their influence over specific regulatory design and enforcement.¹³ Although the bureaucracy has advocated for efficiency measures in part because of broader public policy considerations, there were also direct benefits to the bureaucrats themselves. Efficiency policy was frequently designed to facilitate *amakudari*—employment destinations for retired bureaucrats—by benefiting private firms and quasi-public institutions in closely related fields.¹⁴

Japan stands out cross-nationally in the emphasis placed on energy efficiency by the public bureaucracy as well as the historically influential role bureaucrats have played in policy design and implementation. One indicator that underscores this point is the amount of public sector resources devoted to energy efficiency. Figure 2 plots information from the Energy Charter Secretariat, which collects data on national energy efficiency agencies.¹⁵ As the figure shows, Japan is virtually *sui generis* in terms of both spending per GDP and number of public employees devoted to energy efficiency-related activities. The only country that is somewhat comparable is France, which employs slightly more employees per capita than Japan but devotes considerably fewer public resources.

Figure 2 Energy Efficiency Spending and Employment by Government Agencies, 2005



Source: Energy Charter Secretariat.

The second element of efficiency clientelism is largely consistent with clientelist models of Japanese politics (Curtis 1971; Scheiner 2005; Kitschelt 2000; Fukui and Fukai 1996; Woodall 1996; Richardson 1997). By its nature, transportation policy is wide ranging in its effects and politicized. Virtually all citizens in developed countries utilize some form of motorized transportation in their daily lives. The provision and maintenance of transportation infrastructure requires considerable fiscal outlays and a large labor force, making it a common mechanism through which governments channel resources to preferred constituencies. For this reason, in Japan, as is customary elsewhere, politicians have played an important role in directing the allocation of transportation budgets to benefit their political supporters. This is exemplified by Tanaka Kakuei's Nihon Retto Kaizo Keikaku (Japan reforming plan), which emphasized the construction of road and rail infrastructure to promote the economic development of rural areas and also formed the basis for much of Japan's redistributive politics toward the end of the twentieth century (Tanaka 1972).

Japan's electoral system and fiscal centralization long favored policies designed to benefit particularistic interest groups at the expense of the general public (Rosenbluth 1989; Sakakibara 1991; Ramseyer and Rosenbluth 1993; McCubbins and Rosenbluth 1995; Scheiner 2005).

These electoral incentives allowed governments under the LDP to impose high, diffuse costs on transportation use by the general public but nonetheless retain office by securing support from narrow, organized groups. As I illustrate in the next section, Japanese transportation policies frequently established a direct link between high costs for the general user, which encouraged energy conservation, and redistribution in favor of LDP constituents. Special accounts were established to channel revenues from transportation taxes toward favored groups such as rural residents and the construction industry. Onerous highway tolls on heavily utilized urban routes subsidized road construction and maintenance in rural areas. Exceptions to high costs, such as those for lightweight vehicles, were designed to favor small-business owners and rural residents.

Efficiency clientelism as practiced in Japan developed incrementally over time as the incentives of politicians, constituencies, and bureaucrats lined up in favor of policies serving the dual objective of energy efficiency and clientelistic redistribution. One illustrative example is the *shinkansen* bullet train network. The *shinkansen* predates energy efficiency concerns, with the first route between Tokyo and Osaka completed in 1964. However, the expansion of the network came to be justified and defended on redistributive and efficiency grounds. The classic expression of the redistributive dimension was the expedited construction in 1982 of the *Joetsu shinkansen*, which connects Tokyo to Niigata, the home prefecture of Tanaka Kakuei. LDP politicians saw the *shinkansen* as a mechanism to revitalize rural economies, from which they drew a disproportionate share of their political support. However, expansion of the *shinkansen* network has also been promoted by the bureaucracy as a means to enhance energy efficiency and, in more recent years, reduction in CO₂ emissions, by shifting passenger volumes from less energy efficient air and automobile travel.¹⁶

In sum, Japan's political institutions led to a pattern of policymaking that encouraged energy efficiency by diffusely raising the cost of inefficient transportation, while also redistributing resources to organized supporters of the LDP. In the following section, I examine several specific policy areas that illustrate how efficiency clientelism facilitated energy conservation in Japan.

Efficiency Clientelism in Practice

In this section, I illustrate how efficiency clientelism operated in practice by examining three policy areas: gasoline and automobile taxes, highway tolls, and subsidies for lightweight automobiles. Each of these policy

areas illustrates a distinct mechanism through which efficiency clientelism operated: (1) taxation of energy inefficient automobile transportation, with revenues explicitly earmarked for activities that benefited LDP supporters; (2) the administration of expensive highway tolls through the creation of quasi-government monopolies, which redistributed toll revenues from urban to rural routes; and (3) subsidization of energy efficient automobiles in a manner that disproportionately benefited rural residents. While the specific mechanisms varied, each of these policy measures met the dual objectives of efficiency clientelism: encourage energy efficiency by the general transportation user while delivering asymmetrical benefits to core constituents of the LDP.

Gasoline and Automobile Taxes

Japan briefly experimented with a gasoline tax in the pre–World War II period, but the first continuous taxation policy was established in 1949 in the *Kihatsu Yuzeiho* (gasoline tax law).¹⁷ In 1974, in the aftermath of the 1973 oil shock, the tax was increased on a *zantei* (temporary) basis to raise revenues and encourage the conservation of gasoline (Ministry of Land, Infrastructure, Transport, and Tourism 2002). Aside from the gasoline tax, Japan has imposed a variety of hefty, direct taxes on automobile ownership. All purchases of automobiles are subject to a vehicle acquisition tax of 3 percent. In addition, the *jidoshajuryo zei*, or automobile weight tax, is assessed every three years. The weight tax was established in 1971 and raised sharply during the oil shocks. Although the precise calculation of the tax is complex, a standard compact car is generally assessed 45,000 yen (US\$600) every three years, with heavier (generally less energy efficient) vehicles taxed at higher rates.

The revenues from these automobile-related taxes were specifically earmarked for clientelistic purposes.¹⁸ All revenues from the temporary gasoline tax were designated to the Road Improvement Special Account, which benefited the construction industry and rural residents disproportionately by supporting expansion and maintenance of the road network. Similarly, three-fourths of the revenues from the automobile weight tax were assigned to the Road Improvement Special Account, and one-fourth was designated directly to local governments in rural areas (*shichoson*) (Ministry of Land, Infrastructure, Transport, and Tourism 2002).

These taxes proved durable because they served the dual purpose of energy conservation and redistribution of resources to rural residents and the construction industry. After the oil shocks, raising the cost of gasoline and automobile ownership was seen as an effective means to encourage energy conservation (Furukawa 2007). In more recent years, the

taxes have been defended by environmentally oriented politicians and members of the bureaucracy on the grounds that they will help Japan reduce CO₂ emissions and meet its commitments under the Kyoto Protocol.¹⁹ The taxes also directly benefited key constituencies of the LDP, particularly the construction industry and rural residents, who benefited from expansion and maintenance of the road network.

Gasoline and automobile taxes, however, impose diffuse costs on the Japanese public, directly through higher prices of operating automobiles and indirectly through higher costs associated with the production and distribution of goods. The gasoline tax is deeply unpopular—for example, in a *Toyo Keizai* 2010 poll, although 59 percent of respondents recognized the need for future tax increases, and 46 percent supported an increase in the consumption tax (generally considered the third rail of Japanese politics), only 17 percent supported an increase in gasoline taxes.²⁰

Highway Tolls

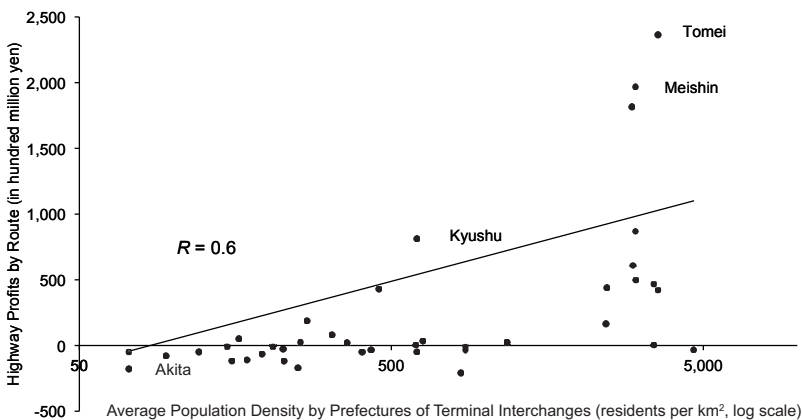
Toll roads have existed in Japan since at least 1871, when the Meiji government promulgated Dajo Kanfukoku No. 648, allowing for the collection of duties on private roads for the purposes of construction and maintenance (Furukawa 2009). However, highway tolls are a much more recent development: Japan had no highways until the construction of the Meishin Expressway, which connected Nagoya and Osaka, in 1963. In 1956, the Japanese government invited World Bank economist Ralph J. Watkins to chair a commission on road improvement. Watkins lamented, “The roads of Japan are incredibly bad. No other industrial nation has so completely neglected its highway system.”²¹ He recommended the establishment of highway tolls as an economical means to realize the rapid development of Japan’s road infrastructure (Hagen et al. 1956).

Acting on these recommendations, the Japanese Diet passed national highway legislation in 1956, which established the Japan Highway Public Corporation (JHPC), a quasi-public “special corporation” to construct and administer Japan’s toll roads. Construction on the Meishin Expressway was initiated in 1958 (Japan Automobile Manufacturers Association 2006). The JHPC was created for two primary reasons: (1) to coordinate road construction and maintenance, which would otherwise be administered separately by the Ministry of Construction and prefectural and local governments; and (2) to supplement public funds with private financing, which the JHPC could raise directly (Furukawa 2009). The JHPC, along with three regional special corporations,²² effectively monopolized Japan’s highways and set toll levels in close consultation with the Ministry of Transport and Ministry of Construction.

During the initial phase of development in the 1960s, highway tolls were established on a road-by-road basis, with the general presumption that tolls would be reduced or eliminated as construction costs were recouped. For example, initial plans called for the elimination of tolls on the Meishin Expressway by 1988, when loans from the World Bank would be fully repaid (Furukawa 2009; Sato 2010). However, in 1972, as part of Tanaka Kakuei's Nihon Retto Kaizo Keikaku, revenues from highway tolls were pooled to support the development of highway infrastructure in rural areas (Sugimoto 2004). This effectively served to redistribute the revenues from profitable routes within and among urban centers such as Tokyo, Osaka, and Nagoya, toward uneconomical routes in rural areas, which doubly benefited from improved infrastructure and the associated construction and maintenance employment. As a consequence, tolls remained high on the heavily utilized Tomei and Meishin routes connecting Japan's metropolitan areas, even after the relevant loans were paid back in full.

Figure 3 provides one illustration of how Japanese highway tolls acted as a redistributive mechanism. The x-axis of the graph is average population density of the prefectures where the terminal interchanges are located for each highway.²³ For example, the Tomei Expressway, which connects Tokyo and Nagoya, is plotted with a population density that is the average of Tokyo and Aichi in the graph.²⁴ The y-axis is highway profitability by route, measured in hundreds of million yen as of 2001 and inclusive of op-

Figure 3 Profitability of Highways and Population Density, 2001



Sources: Sugimoto (2004); Statistics Bureau, Ministry of Internal Affairs and Communications.

erating costs and interest payments associated with construction loans.²⁵ As the graph indicates, unprofitable highway routes in Japan are concentrated in rural areas with low population density—for example, the Akita Expressway, which connects two sparsely populated regions in Iwate and Akita prefectures. In comparison, major urban routes such as the Tomei and Meishin deliver the bulk of profits to the highway system, even though loans associated with initial construction have been repaid.

This pricing structure facilitates energy efficiency in Japan's transportation sector by suppressing intercity automobile transport and shifting passengers to more energy efficient rail.²⁶ Consider, for example, travel between Tokyo and Osaka versus travel between San Francisco and Los Angeles in California.²⁷ In Japan, driving is made highly unattractive by highway tolls: the cost of tolls and gasoline alone come to about \$200, and the trip takes around six hours, assuming no traffic.²⁸ In comparison, the *shinkansen* bullet train costs about \$170 with a total trip length of 2.5 hours. Flying has become competitive in recent years, with prices ranging from \$145 to \$275, depending on the carrier, but given the time required to reach airports and to board planes, the *shinkansen* is generally faster for most business travelers within a 500-mile travel distance.²⁹ In comparison, in the United States, rail travel is impractical: a trip between San Francisco and Los Angeles takes eleven hours and costs \$53. Driving is faster and cheaper—about six hours and \$30 for the cost of gasoline; flying is more expensive but much faster—about \$100–\$250 and roughly three hours, even accounting for time spent at airports.

Lightweight Automobiles

One unique element of Japanese policy in the transportation sector has been the promotion of *keijidosha*, or kei-cars. Kei-cars are defined by restrictions on engine displacement and car size and are subject to a variety of incentives such as lower taxes and insurance costs and relaxed registration requirements. For example, in 2010, compared to a regular compact vehicle, a kei-car purchased for personal use was subject to reductions in taxes as follows: 2 percent reduction in automobile acquisition tax, \$530 reduction in automobile weight tax, and \$270 reduction in yearly automobile tax.³⁰ Government support for kei-cars was initially implemented in Japan after World War II as a means to advance motorization.³¹ However, government support continued and expanded even after Japan became one of the largest automobile markets in the world.

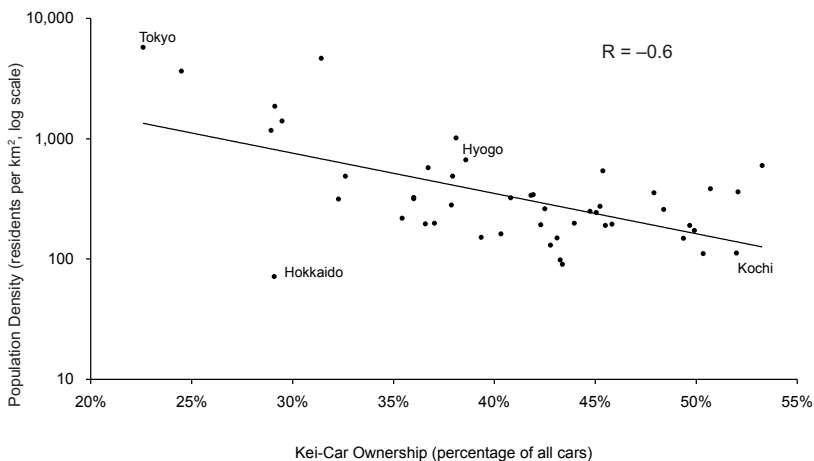
Kei-cars, because they tend to be lighter and smaller, are generally more energy efficient than regular automobiles. In 2006, regular automobiles in Japan emitted about 0.19 kg CO₂ per passenger kilometer,

compared to about 0.15 for the average kei-car (Lipsy and Schipper 2012). For this reason, MLIT officials have advocated for the maintenance of public support for kei-cars as a means to facilitate automobile fuel efficiency and reduce CO₂ emissions.³² This government support has contributed to the expanding share of kei-cars in Japan's automobile fleet despite economic development, which generally pushes consumers toward more expensive, larger automobiles; the proportion of kei-cars in Japan's fleet has increased from about 10 percent in the 1970s to above 25 percent by 2007 (Lipsy and Schipper 2012).

Subsidization of kei-cars has also been politically attractive because it serves a key constituency of the LDP—residents of rural areas. Government subsidies for kei-cars are particularly generous in rural areas of Japan, where the absence of practical public transit means that many households own two vehicles. According to surveys, kei-cars are particularly popular in rural areas as a second vehicle, which housewives use for errands and chores (Ozeki 2009). In addition to the benefits mentioned, kei-car owners in rural areas receive a 20 percent discount on highway tolls and a waiver on the mandatory registration of parking space associated with the vehicle.

As Figure 4 illustrates, kei-car ownership in Japan is inversely related to population density. Ownership is highest in rural prefectures such

Figure 4 Kei-Car Ownership and Population Density, in Japan's Prefectures



Sources: MLIT; Statistics Bureau, Ministry of Internal Affairs and Communications.

as Kochi, Nagasaki, Shimane, and Okinawa, where kei-cars account for over 50 percent of automobiles. In comparison, in Tokyo-to, which has the lowest share, kei-cars account for only 23 percent of automobiles (Miyazaki, Hikaru, and Akaba 2009). Hence, a major justification for maintaining subsidies for kei-cars is to assist the economic well-being of rural areas by facilitating the availability of cheap cars.³³

Kei-car subsidies provide a clear illustration of how efficiency clientelism has functioned in Japan. The subsidies long predate concerns about energy efficiency and CO₂ emissions. However, the policy was sustained and reinvigorated well after the initial goal of motorization was accomplished, as officials recognized the utility of promoting automobile fuel efficiency in rural areas, where public transportation is relatively underdeveloped. The policy proved durable as the benefits accrued disproportionately to rural residents—a crucial, overrepresented constituency of the LDP under Japan's prior electoral system.

Efficiency Clientelism and the DPJ

Across the policies associated with efficiency clientelism, an important consideration was compatibility with core constituencies of the LDP—for example, rural residents, the transportation industry, and the construction industry. Japan's energy efficiency measures in the transportation sector were designed to redistribute resources from the general public to this narrow support base of the incumbent party. Over the past two decades, several changes to the Japanese political system have undermined the sustainability of these redistributive arrangements and upended Japan's transportation policymaking.

First, electoral reform in 1994 replaced the old single nontransferable vote/multimember district (SNTV/MMD) system with a mixed system placing greater emphasis on plurality voting in single-member districts. This has shifted the electoral strategy of politicians away from narrow appeal to particularistic interest groups—the construction industry, for example—toward broader appeal to the median voter (Rosenbluth and Thies 2010; Scheiner 2012). Second, as the status of bureaucrats has declined with adverse economic performance and a series of scandals (Pharr 2000; Ozeki 2009), initiatives have been implemented to shift power away from the bureaucracy to politicians. This has diminished the influence of the bureaucracy, which has been an important advocate for efficiency measures. Finally, the DPJ emerged as a serious competitor to the LDP and finally took over control of the government in 2009.³⁴

These changes have affected basic elements of Japan's transportation policy. In an electoral system that incentivizes politicians to seek broad support from the electorate, high, diffuse costs associated with transportation have increasingly come under attack. Public opinion polls have generally found dissatisfaction with high prices. According to a *Kyodo* poll, 72 percent of the general public opposed the gasoline tax in 2007.³⁵ A poll by the Cabinet Office in 2005 also found significant opposition to highway tolls, with 30 percent saying current levels were satisfactory or tolerable, compared to 52 percent who supported lower tolls.³⁶ Similarly, a survey by the Japan Automobile Manufacturers Association (JAMA) found that 57 percent of survey respondents supported elimination or reduction of the automobile weight tax.³⁷

Japan's old SNTV/MMD electoral system allowed politicians to largely sidestep such diffuse opposition from the general public. For example, the temporary gasoline tax rate was raised repeatedly in 1976, 1979, and 1993. As a result of these tax hikes, the gasoline tax in Japan rose roughly 90 percent between 1974 and 1993. In comparison, the tax rate has never been raised since electoral reform in 1994. This is in contrast to Europe, where governments have continued to raise gasoline taxes as a means to facilitate reductions in CO₂ emissions.³⁸ This stagnation since 1993 has lowered Japan's relative gasoline tax rate from about 80 percent of the Organisation for Economic Co-operation and Development (OECD) average rate in 1980 to about 60–70 percent in recent years.³⁹

As a minority party, the DPJ sought popular appeal by attacking the high cost of transportation, portraying existing arrangements as wasteful giveaways to special interest groups. The DPJ took up the banner of transportation reform most clearly in 2003, when it adopted a set of proposals formulated by Yamazaki Yasuyo, a former partner at Goldman Sachs who had run unsuccessfully for governor of Tokushima prefecture in 2002. Yamazaki argued that elimination of highway tolls would stimulate economic activity by reducing transportation costs, while the costs could be covered by eliminating waste and converting Japan Public Highway Corporation bonds into Japanese government bonds, which carried a lower interest rate (Yamazaki 2003). Yamazaki was named MLIT minister in the DPJ's shadow cabinet, and the party adopted his ideas in its first campaign manifesto, prepared for the 2003 lower house election.⁴⁰

From that point on, transportation reform remained a central element of the DPJ's policy platform. In 2008, the DPJ manufactured a political showdown with the LDP over extension of the temporary gasoline tax. Having replaced the LDP as the largest party in the upper house election of 2007, the DPJ refused to approve the extension. Under Japan's parlia-

mentary rules, the LDP could utilize its two-thirds lower house majority to overrule the DPJ, but it had to wait until sixty days after the upper house had rejected the relevant legislation. The DPJ held up the legislation and forced a brief repeal of the temporary gasoline tax in April during the sixty-day waiting period.⁴¹

The DPJ took maximum advantage of the political theater surrounding gasoline. Yamaoka Kenji, chair of the Diet Affairs Committee, referred to the ongoing Diet session as the Gasoline Kokkai (gasoline Diet) and remarked that he would force the LDP into a Gasoline Kaisan (gasoline dissolution of Parliament). The DPJ formed a Gasoline Nesagetai (gasoline price cut unit), composed of fifty-two lower house members and led by Kawauchi Hiroshi. The unit spread out across the country to publicize the issue and picketed the Diet building in an attempt to thwart gasoline-related legislation.⁴²

Importantly, the LDP was subject to similar electoral incentives during this period (Scheiner 2012; Lipsy and Scheiner 2012; McElwain 2012). Both parties faced strong incentives to adopt populist policies with broad appeal to the general public, and given the unpopularity of status quo transportation policies, it was natural that electorally minded reformists in each party seized upon the issue. In the LDP, Prime Minister Koizumi Junichiro made reform of the transportation sector a key element of his *seiiki naki kozo kaikaku* (reform without sanctuaries). Koizumi boosted his popular appeal by portraying traditionalists within his own party as *teikoseiryoku* (the forces of resistance), and he succeeded in privatizing Japan's major highway corporations in 2004. In 2008, LDP prime minister Fukuda Takeo co-opted a DPJ policy proposal to shift revenues associated with the Road Improvement Special Account to the general account budget (Furukawa 2008). This effectively severed the connection between highway tolls and gasoline taxes on the one hand and road construction and maintenance on the other, putting an end to the redistributive element associated with these policies. LDP prime minister Aso Taro similarly implemented a reduction of highway tolls in March 2009, although it was limited to weekends and holidays on nonurban routes.

Elimination of highway tolls and gasoline taxes remained popular, and they were retained as central components of the DPJ's 2009 campaign manifesto.⁴³ However, by the time the DPJ came to power, reforms by the LDP had obviated the relationship between transport taxes and tolls on the one hand and redistribution to particularistic interest groups on the other. In effect, transportation taxes were stripped of their explicitly clientelistic character by 2009. What remained was the environmental and fiscal impact of dramatically cutting government taxation on automobile transportation.

Once in power, the DPJ was confounded by the “efficiency” dimension of efficiency clientelism. The DPJ, with its urban support base, sees itself as more of a green party compared to the LDP.⁴⁴ One of Prime Minister Hatoyama’s signature announcements upon entering office was a 25 percent CO₂ emissions reduction target, which was considerably more aggressive than any previously proposed by the LDP. However, the DPJ’s campaign pledges related to transportation clearly ran counter to these environmentalist goals. In general, reduction of highway tolls and gasoline taxes encourage automobile travel versus more energy efficient modes of transportation, primarily air and rail.⁴⁵ Thus, simulations indicate that elimination of highway tolls would raise Japanese CO₂ emissions immediately by about 4 million tons per year (Yai 2009). Similarly, expiration of the temporary gasoline tax is projected to raise CO₂ emissions by about 8 million tons immediately and 24 million tons per year by 2015, as consumers adjust their purchasing decisions and behavior in response to the price shift (Ministry of the Environment 2008). In combination, these policy changes would increase Japan’s transportation sector CO₂ emissions by more than 10 percent per year.

These environmental externalities posed a major roadblock to the DPJ’s transportation reform proposals. Along with environmentally oriented party members, the Social Democratic Party, the DPJ’s coalition partner, vocally objected to the elimination of highway tolls on the grounds that they would run against emissions reduction goals.⁴⁶ Furthermore, major intraurban and interurban highway routes, including the Meishin and Tomei, were removed from proposed reductions due to the potential for an adverse environmental impact. MLIT minister Maehara Seiji explained that these urban routes were left out because they “are likely to become congested, with adverse effects for CO₂ emissions.”⁴⁷ However, recall that these are the most utilized routes that should have been become toll-free earliest as World Bank loans were repaid. Perversely, environmental concerns transformed the DPJ’s highway toll-reduction plans into an updated version of Tanaka Kakuei’s *Nihon Retto Kaizo Keikaku*—high tolls on heavily utilized, urban routes, coupled with toll-free rural routes. Unsurprisingly, popular support for the DPJ’s highway toll policy plummeted.⁴⁸

The fact that revenues from transportation taxes were now earmarked for the general budget also engendered objections from the Ministry of Finance and budget hawks within the DPJ. One of the signature initiatives of the new DPJ government was the *jigyo shiwake*, a process by which individual government programs were screened and streamlined. MLIT’s proposed budget for elimination of highway tolls and gasoline taxes became candidates for rationalization under the *jigyo shiwake*. Finance Minister Fujii Hirohisa and Senior Vice-Minister of Finance Noda Yoshi-

hiko argued that the cuts should be scaled back dramatically.⁴⁹ The budget allocation for highway tolls was ultimately reduced to about a sixth of the original proposal (Yamazaki 2010).

Internal divisions also impeded the implementation of DPJ transportation initiatives. Constraints attributable to first-past-the-post electoral rules, the nearly coequal status of the upper house, and newfound political leverage exerted by local politicians have left both the DPJ and LDP internally divided between reformers and traditionalists in recent years (Scheiner 2012; Shimizu 2012). These divisions led to speculation during the initial stages of Koizumi's term of office that he might split the LDP to join ranks with reformist elements in the DPJ. For example, Kan Naoto of the DPJ noted in 2001, "If Koizumi submits his reform proposal to the Diet, and it is something we can sympathize with, the DPJ will support it. Even if the DPJ and part of the LDP support the proposal, it will likely be rejected in the Diet. At that point, the Prime Minister must decide whether he gives up or takes his case to the people."⁵⁰ However, Koizumi ultimately pursued reform within the LDP, campaigning against traditionalist politicians in his own party (Reed, McElwain, and Shimizu 2009).

Just as Koizumi encountered resistance to transportation reform within his own ranks, the DPJ faced significant internal divisions between politicians hoping to please the broad electorate and those catering to local interests. Particularly fierce resistance was encountered from politicians with close ties to labor unions associated with Japan Railways,⁵¹ ferry operators,⁵² and bus operators.⁵³ These groups feared that highway toll reductions and automobile-related tax reductions would lead to a shift away from their businesses in favor of private automobile transportation. The DPJ repeatedly modified its proposals to accommodate these groups—for example, by increasing the tolls on the bridges connecting Honshu to Shikoku to accommodate ferry operators (Yamazaki 2010).

The DPJ's transportation policy gradually moved toward *de facto* maintenance of the status quo with minor adjustments. The automobile acquisition tax has remained unchanged. The automobile weight tax, which was slated for elimination, was instead reduced modestly.⁵⁴ The gasoline tax was replaced by a new CO₂ tax, implemented beginning in 2011 over a three-year period. The revenues from the tax were directed to support the development of green technologies such as renewable energy. However, this was a largely symbolic gesture, since revenues generated from the gasoline tax had already been transferred to the general account budget. The tax effectively replicates the preexisting gasoline tax in all but name. According to forecasts, gasoline prices are projected to rise by about 0.76 yen per liter (about 3 cents per gallon), and the ex-

pected reduction in CO₂ emissions associated with the tax is only about 1 percent cumulatively by 2020.⁵⁵

The March 11, 2011, Tohoku earthquake, which devastated northeast Japan and led to a nuclear crisis at the Fukushima Dai Ichi plant, put a decisive end to the DPJ's plans to eliminate highway tolls. Plans for toll reductions had already been scaled back dramatically by early 2011. After the earthquake, the DPJ chose to "freeze" plans to eliminate highway tolls in order to raise revenues for reconstruction. However, senior MLIT vice-minister Ikeguchi noted, "The government cannot quite say that it is abandoning [the toll elimination policy], so it wrote 'freeze,' but in reality, it is a foregone matter."⁵⁶ Toll roads remained free only for the disaster-affected Tohoku region through March 2012 and for those displaced by the nuclear accident at Fukushima through September 2012.

Conclusion: The Future of Energy Efficiency in Japan

Japan's economy stands out for being remarkably energy efficient. In this article, I have argued that one important pillar of Japanese energy efficiency policy has been destabilized by political developments over the past two decades. Under what I call efficiency clientelism, policies served a dual role: to promote energy efficiency while delivering economic benefits to key constituencies of the LDP. Political changes since the 1990s have diminished the feasibility of such arrangements. In particular, electoral reform, which incentivizes broad public appeal, has made it more difficult to sustain policies that encourage energy efficiency by imposing diffuse costs on the general public. The DPJ pursued an electoral strategy that sought popular support by attacking policies associated with efficiency clientelism, such as high highway tolls and gasoline taxes. However, this put the DPJ in a conundrum once in power; its policy initiatives in the transportation sector ran directly counter to its ambitious environmentalist objectives.

Political change over the past twenty years leaves Japanese transportation energy efficiency policy in a state of uncertainty and flux. Although policies that facilitated efficiency in the past remain under challenge, no credible alternative mechanisms have emerged. Unlike previous policies under efficiency clientelism, there is no clear political constituency in Japan for new measures such as a CO₂ tax. Surveys indicate that popular support for the CO₂ tax has ranged between about 25 percent and 40 percent in recent years.⁵⁷ Officials indicate that the only enthusiastic supporter of the CO₂ tax is the Ministry of Finance, which favors the measure from a revenue standpoint.⁵⁸ Although unions associated with alternative transportation industries played an important role in reducing

the scope of highway toll reductions under DPJ rule, there are also compelling interest groups on the other side of the issue—for example, the automobile industry and affiliated unions. Green energy producers are hardly a formidable political constituency on par with rural residents and the construction industry in the heyday of LDP rule.

Will Japan be able to remain a global leader in energy efficiency despite these shifts? Besides these political challenges, Japan faces the more practical difficulty of diminishing returns. Because Japan has already achieved relatively high levels of energy efficiency, incremental improvement is expensive and sometimes impractical. For example, one initiative MLIT has been working on is shifting commercial freight from trucks to rails.⁵⁹ However, as a practical matter, further improvements have proved challenging. Japan has already achieved high utilization on existing rail tracks, which means there is very little spare capacity open for commercial use. This is a particularly difficult problem once freight trains arrive in major metropolitan areas such as Tokyo and Osaka. In urban areas, there is no idle capacity during peak hours in the morning and evening, so commercial trains must stop. Between Tokyo and Osaka, trains must also pass through several urban areas, and moving through these areas without delay is difficult. Because land is scarce in Japan and population densities in urban areas are high, further expansion of the capacity of the rail network will take an excruciatingly long time. A major shift from truck to rail freight in Japan is highly unlikely precisely because Japan already relies so heavily on rail transportation.

However, there are some trends in Japan that will likely have a beneficial long-term impact on energy efficiency and CO₂ emissions. Japan's demographic profile—an increasingly older and smaller population—is often cited as a negative factor for its economy and international standing. However, Japan's demographics are helpful when considering energy use and CO₂ emissions. A shrinking population will require less energy over time. The elderly tend to drive less than the young. The continuing movement of people into densely populated urban areas, such as Tokyo, means greater use of more energy efficient public transportation. In addition, *kuruma banare* (moving away from cars) among young Japanese is frequently reported by the media, and government surveys indicate that ownership of automobiles by Japanese below the age of forty has declined sharply in recent years.⁶⁰ There are therefore some important factors, largely orthogonal to efficiency policy, that are moving Japan toward greater energy efficiency and lower emissions.

It is also important to emphasize again that efficiency clientelism is not the only policy model that has contributed to Japanese energy efficiency.

Japanese fuel economy standards are the most stringent in the world and will likely remain so for the foreseeable future. Also of note are policy innovations such as the “top-runner” program. The top-runner program, introduced under the Energy Conservation Law in 1998, has been applied to a range of areas including fuel economy standards. The program is designed to automate improvements in efficiency over time by setting target improvements based on the current highest-efficiency product in each sector. It is the first program of its kind and is widely recognized as an important innovation in energy efficiency policymaking. It is an open question whether the bureaucracy will continue to retain the initiative and autonomy necessary to maintain the effectiveness of programs such as top-runner, but to date, the program appears to enjoy the support of the DPJ government.

Japanese policymakers may also be able to compensate for losses in transport energy efficiency by pursuing greater efficiency in other sectors. In transportation, the crucial choices that affect total energy consumption—how far to travel, whether to fly or ride the train, what kind of automobile to purchase—are decentralized, individual-level decisions. For this reason, it is difficult to facilitate efficiency without imposing higher costs on energy use by the general public. Maintaining such diffuse, high costs has become less feasible under Japan’s current electoral system. By contrast, in the industrial sector, energy efficiency is typically achieved by targeting a relatively small set of energy-intensive producers. Power generation lies somewhere in between—utilities are concentrated, but overall electricity consumption is determined by the autonomous decisions of individuals. Hence, the prognosis for Japanese energy efficiency in sectors aside from transportation may be more encouraging in comparison.

An obvious extension of this article would be to consider the relationship between electoral arrangements and energy efficiency in a wider set of countries. Elsewhere, I have examined two other episodes of electoral reform in the OECD—in Italy and in New Zealand—and found changes in energy efficiency consistent with the Japanese experience outlined here. Cross-national evidence also points to higher energy prices and greater transportation energy efficiency in nonmajoritarian electoral systems, where it is more feasible to design political arrangements imposing diffuse costs on the general population (Lipsky 2011).⁶¹ However, this remains a largely unexplored topic, and much research remains to be done.

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Notes

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1. The DPJ was able to force a temporary expiration of the *zantei zei* (temporary tax) in April 2008 due to its control of the upper house and parliamentary rules that forbade the lower house from overturning upper house decisions for sixty days.

2. Calculated from table on pages 6–7 of Democratic Party of Japan (2009).

3. An exception was made for the Tohoku region through March 2012 and for those displaced by the nuclear accident in Fukushima through September 2012.

4. Although the precise rate depends on automobile class and type, the reduction was about 20 percent for a typical compact vehicle. For more detail, see “Heisei 22 nendo zeisei kaikaku ni tomonau jidosha juryo zei no henko ni tsuite,” www.mlit.go.jp/common/000111305.pdf.

5. For example, see Yamazaki (2010); Mulgan (2010); and “Flip-flop on Highway Tolls,” *Asahi Shimbun*, April 24, 2010.

6. Kamioka (2010) provides an extensive technical treatment of this issue.

7. It is worth noting, however, that the degree of urban concentration is itself endogenous to policy choices over long time horizons. It is more feasible to live in suburban areas requiring long automobile commutes in the United States in part because automobile transportation is less costly compared to Japan.

8. For example, Alexander Jacoby, “Japan’s Culture Offers Hope for the Environment,” *Japan Times*, April 28, 2007.

9. Although I have opted for simplicity here for the purpose of illustration, Japan stands out even after controlling for potentially confounding factors such as land area, population density, urbanization, climate, and level of development. For a more detailed analysis, see Lipsy (2011) and Lipsy and Schipper (2012).

10. In some cases, rail may be inferior to other modes if ridership is consistently low, as is sometimes the case in rural areas.

11. Although Japan also pursued other strategies, such as source diversification and a buildup of nuclear energy, these are not directly relevant to transportation policy. For an early overview, see Samuels (1987, chap. 6).

12. Prior to administrative reorganization, the equivalent actors were the Ministry of Transport, Ministry of Construction, the Ministry of International Trade and Industry, and the Environmental Agency.

13. Personal interview, MLIT official, June 10, 2011.

14. Inose (2008) provides a particularly incisive critique of these practices in the transportation sector.

15. There are some problems with this type of data, such as inherent ambiguity about what tasks certain agencies perform and which of their employees are devoted to energy efficiency, although the charter has attempted to account for this in their data collection. Japan's high numbers are primarily driven by METI and the New Energy and Industrial Technology Development Organization (NEDO).

16. Personal interview, MLIT officials, September 22, 2010.

17. The full text is available at <http://law.e-gov.go.jp/htmldata/S32/S32H0055.html>.

18. Inose (2008) provides a detailed overview and critique.

19. Personal interview, MLIT official, June 10, 2011.

20. "Zoei wa fukahi to kangaeru hito wa roku wari jaku" [Nearly 60 percent see increases in taxes inevitable], *Toyo Keizai*, May 31, 2011.

21. For example, see discussion in Road Bureau of the Ministry of Land, Infrastructure, and Transport (2010).

22. They were: the Metropolitan Expressway Public Corporation (administration of highways in Tokyo and immediate vicinity), Hanshin Expressway Company (administration of highways in Osaka and immediate vicinity), and Honshu-Shikoku Bridge Expressway Company (administration of bridges between Honshu and Shikoku).

23. Data are from Sugimoto (2004).

24. This is an imperfect measure, as it does not capture variation in population density en route. However, most Japanese highways are short in distance and terminate at major or local population centers, so the measure should perform reasonably well as a proxy in most cases.

25. The Japan Expressway Holding and Debt Repayment Agency, established in 2005, no longer reports profitability figures by route inclusive of costs associated with highway construction.

26. See the extensive analysis in Yai (2009) and Kamioka (2010).

27. Distance and travel time information is obtained from Google Maps. Pricing information is obtained from relevant carriers and average local gasoline prices from Energy Information Administration and the Oil Information Center. All data as of June 2011. The distance between San Francisco and Los Angeles is somewhat greater, about 380 miles, compared to about 320 miles for Tokyo and Osaka, but this does not bear significantly on the results.

28. Trip based on travel between Kasumigaseki and Minatomachi during a regular business day. Tolls are 13,500 yen, and the cost of gasoline amounts to about 4,000 yen as of summer 2011. I use an exchange rate of 80 yen to the dollar throughout.

29. Personal interview, MLIT official, September 2010.

30. Dollar figures computed at 80 yen per dollar. The automobile weight tax is assessed every three years.

31. For an overview, consult Ozeki (2009).

32. Personal interview, MLIT officials, September 22, 2010.

33. Personal interview, MLIT officials, September 22, 2010.
34. Cross-national studies have found that increases in party competition tend to be associated with declines in clientelistic policies. For example, see Kitschelt and Wilkinson (2007).
35. "Naikaku shijiritsu 41 percent," *Kyodo Tsushin Yoron Chosa*, January 12, 2008.
36. Cabinet Office (Japan), "Doro ni kansuru yoron chosa," July 2005.
37. "Jidosha no zeikin ni tsuite," Japan Automobile Manufacturers Association Report No. 91, 2001.
38. For example, Germany implemented a gasoline tax hike of 10 cents per year between 1999 and 2003 as part of its Ecological Tax Reform (ETR).
39. Calculated based on prices for regular unleaded gasoline (US\$/liter in purchasing power parity [PPP]). Data from the International Energy Agency.
40. See, for example, Iwami (2008, 90); Yamazaki (2008).
41. See, for example, Linda Seig, "Japan Parliament Set to Clash over Gasoline Tax," Reuters, January 28, 2008; Sachiko Sakamaki, "Fukuda Renews Japan Gas Tax, Facing Down Opposition," Bloomberg, April 30, 2008.
42. "Minshuto 'gasoline nesagetai' hossoku," *Sankei Shimbun*, January 15, 2008.
43. Democratic Party of Japan, "The Democratic Party of Japan's Platform for Government," 2009.
44. Personal interview, DPJ party official, June 6, 2011.
45. In some instances, where local roads are congested due to expensive highway tolls, this effect could be mitigated or even reversed. Prior to the Tohoku earthquake of March 11, 2011, MLIT was conducting pilot studies to examine the net effect of local highway toll elimination on realized emissions. These studies were called off as the political climate changed after the earthquake and elimination of tolls became highly unlikely. Personal interview, MLIT officials, June 10, 2011.
46. For example, see Social Democratic Party (Japan), "Kosoku doro no muryoka/1000 yen ni tsuite," August 16, 2009, www5.sdp.or.jp/policy/policy/other/090816.htm; "Fukushima toshu, minshu no kosoku muryoka to kodomo teate ni iron," *Yomiuri Shimbun*, August 27, 2009.
47. See "Kosoku muryoka de Tomei, Meishin wa jogai," *Kyodo Tsushin*, November 25, 2009; "Kosoku muryoka, Tomei Meishin Honshu-Shikoku Renrakusen wa jogai," *Asahi Shimbun*, November 20, 2009.
48. For example, in a Yomiuri poll conducted in April 2010, only 23 percent of respondents approved of the DPJ's handling of the highway toll reduction plan. Other DPJ policies included in the survey received more favorable support: free high schools (54 percent), agricultural policy reform (50 percent), child allowance (43 percent). "Hatoyama naikaku shijiritsu kyuraku 33 percent," *Yomiuri Shimbun*, April 5, 2010.
49. "Kosoku muryoka, shinkansen ga koho: sasshin kaigi no jigyo shiwake," *Kyodo Tsushin*, October 29, 2009; "Kosoku muryoka 'soan wa matomatte iru' Maehara Kokko Daijin," *Response*, December 4, 2009.
50. My own translation of excerpt in Inose (2008, 27).

51. “‘Kosoku muryoka’ JR shien no Minshuto giin wa itabasami,” *Asahi Shimbun*, September 14, 2009.
52. “‘Kosoku muryoka ni danko hantai’ kansai ferry 7 sha ga uttae,” *Kyodo Tsushin*, October 29, 2009.
53. “Bus kyokai ga kosoku muryoka ni hantai: Kokkosho ni kinkyu yobou-sho,” *Kyodo Tsushin*, October 19, 2009.
54. Although the precise rate depends on automobile class and type, the reduction was about 20 percent for a typical compact vehicle. For more detail, see “Heisei 22 nendo zeisei kaikaku ni tomonau jidosha juryo zei no henko ni tsuite,” www.mlit.go.jp/common/000111305.pdf.
55. “Zeisei taiko wo kakugi kettei,” *Yomiuri Shimbun*, December 17, 2010; “11 nendo zeisei kaisei,” *Mainichi Shimbun*, December 17, 2010.
56. For example, “Kosoku muryoka, fukkatsu konnan,” *Jiji Press*, August 8, 2011 (my translation of Japanese original).
57. Japan Cabinet Office, “Chikyu ondanka taisaku ni kansuru yoron chosa,” various years.
58. Personal interview, MLIT official, June 10, 2011.
59. Personal interview, MLIT officials, June 11, 2009.
60. Ministry of Internal Affairs and Communications, “Zenkoku shohi jittai chosa,” 2010.
61. There is also a related literature on the cross-national variation between general price levels and electoral systems, but it does not consider energy policy or the potential environmental externalities of energy price differentials (Rogowski and Kayser 2002; Chang et al. 2010).

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