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“Japan’s Fuel Efficiency Regulations and the Car Industry: a Study from Policy-Network Approach”.

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## Abstract

This paper analyses Japanese fuel efficiency regulations by using 'Policy Network Approach'. As a result of this research, this paper emphasises following three findings: first, Japanese fuel efficiency regulations has been decided by the form of 'Co-Regulation' between the state and the Japanese car industry; second, Japanese car industry influences this decision making process via the 'Japan Automobile Manufacturers Alliance' (JAMA), which has been the central network amongst the Japanese car industry; finally, governmental network amongst Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Ministry of Economy, Trade and Industry (MITI), industrial network amongst Japanese car industry, and the academic network amongst Japanese academia, have been the central networks which decides the Japanese fuel efficiency regulations.

Key words: Fuel Efficiency Regulations, Policy Network Approach, Japanese Car Industry. And the Business-State relations

## 1. Introduction

With the widespread of the 'motorization' in 20<sup>th</sup> century, the transport sector accounts for about 20% of the world's total carbon dioxide (CO<sub>2</sub>) emission, and about 73% of these are from the use of cars (IEA 2005).

In Japan, the CO<sub>2</sub> emission from the transport sector accounts for about 20% of the total Japanese emissions, and about 90% of these are from the use of cars. Furthermore, Japan represents one of the biggest car manufactures. Therefore, the fuel efficiency regulation has been the central measures both from the view points of the reduction of CO<sub>2</sub> emission as well as for the prosperity of the Japanese car industry.

In spite of the considerable importance of the fuel efficiency regulation policy, less attention has been paid to what kind of actors determined the Japanese fuel efficiency standards and in what kind of dynamics. This paper analyses this policy dynamics by deploying the 'Policy Network Approach' as the analytical framework. By emphasizing 'resource dependency' amongst actors, this method is useful in terms of grasping the whole image of the policy dynamics - or the structure of the decision-making process - as well as looking at what kind of resource do actors possess, and how their resources connected to one another. The data which I used for the analysis are based on the interviews to Japanese car industry, the related document and existed literature in this field.

The chapter 2 introduces the policy network approach as the analytical framework. In chapter 3, I will review the brief history of the fuel efficiency regulations. Chapter 4 analyses Japanese fuel efficiency regulations by using 'Policy Network Approach'. Chapter 5 concludes my argument.

## 2. Analytical framework: Policy Network Approach

### 2.1. 'The Agency Beyond the States'

Since this research is focusing on the car industry as the case study of 'business actors approach'<sup>1</sup> in the context of the politics of global warming, this research can be located in the area of 'the Agency beyond the State'. Before we move on to the main discussions, I would like to briefly mention the importance of business actors in thinking about the global environmental governance.

On the one hand, business interests are directly affected by environmental regulation; on the other hand, their activities could affect the global environment both *positively* and *negatively*. Their decisions on technological investments have significant implications for the effectiveness of international environmental regimes. Since the regulatory options included in international environmental agreements largely depend on the availability of existing technological knowledge, businesses "can set the parameters of what is politically achievable in the international politics of environmental protection" (Falkner, 2008:12).

Also, as their economic activities are so closely linked with the wealth of state, they possess considerable influence over the state decision-making. Scholars with Marxist tradition argue that since technologies associated with the use of oil and coal

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<sup>1</sup> For the general account of the role of business actor in the environmental politics, see Jennifer Clapp (2005); Levy (1997); Rowlands in Josselin and Wallace (2001). For the Agent beyond state approach, see Phillip Pattberg (2007) 'Private Environmental Governance' (USA: Edward Elger). For the Neo-Gramscian account, see Matthew Paterson and Peter Newell(1998); David Levy and Peter Newell (2005). For the Pluralist account, see Robert Falkner (2001, 2005, 2008).

have been central to the nineteenth and twentieth century capital accumulation, fossil fuel companies in particular were conferred a great structural power over state decision-making (Newell and Paterson, 1998: 691-695).

In the discipline of the International Relations, this Agency beyond the State approach is increasingly important given both 'state as the principal actor approach' and the rational choice approach fails to explain how the domestic context matters to the behaviour of the state and thus to its impacts upon the international negotiation.<sup>2</sup> By focusing on the dynamics of the decision-making process of the domestic environmental policy process, this research aims to contribute to the domestic politics approach which could potentially link with the behaviour of the state.

## **2.2. Policy Network Approach: Rhodes model**

This paper deploys the Policy Network Approach<sup>3</sup> as the analytical framework. Policy Network Approach assumes that purposes, strategies, resources and values of each actors (for instance, government, firms, environmental NGOs) in a certain policy process are largely differentiated. However, since they share a certain policy process, they construct relationship (strategic collaborative relations or inter-organizational relationship) by exchanging own resources to one another. Policy network Approach,

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<sup>2</sup> For instance, see Elizabeth Desombre (2000), *Domestic Source of International Environmental Policy: Industry, Environmentalists, and U.S. power*, MIT Pr; Miranda Schreurs (2003), *Environmental Politics in Japan, Germany and the United States*, (Cambridge University Press).

<sup>3</sup> Network approach is used in many disciplines and there are many types of networks exist. In this paper, it deploys the policy network approach proposed by R.A.W.Rhodes (1986, 1990, 1997). On the various types of network analysis, see Ansell in Binder et al (2006), and on the different conceptions of policy network approach, see Borzel (1998).

therefore, is a framework which helps us to capture relations amongst the actors in a certain policy process (Masaki , 1999).

Rhodes (1997, pp.36-37) has developed 'Rhodes model' as one of the typologies of policy networks, based on a theory of power-dependence. It contains five propositions:

- 1) Any organization is dependent upon their organizations for resources
- 2) In order to achieve their goals, the organization have to exchange resources
- 3) Although decision-making within the organization is constrained by other organizations, the dominant coalition retains some discretion. The appreciative system of the dominant coalition influences which relationships are seen as a problem and which resources will be sought.
- 4) The dominant coalition employs strategies within known rules of the game to regulate the process of exchange
- 5) Variations in the degree of discretion are a product of the goals and the relative power potential of interacting organization. This relative power potential is a product of the resources of each organization, of the rules of the game and of the process of exchange between organizations

The 'Power dependence' is the central feature of policy networks. As Rhodes (1997 p.11) notes, 'the distribution, and type, of resources within a network explains the relative power of actors'. Rhodes has advocated the following five types of resources: *Constitutional-legal; Financial; Political; Informational; and Organizational* (Rhodes 1986). As for the types of networks, following five types are mentioned by Rhodes

(1990; 1997, p.38): *Policy Communities/territorial community; Professional network; Intergovernmental network; Producer network; Issue network.* (Summarised in Table 1).

Although these conceptions and definitions of resources and types of networks are useful, however, since Rhodes model has developed by focusing on the study of welfare state service of the British central-local relations, not all of the conceptions and definitions are applicable to the study of fuel efficiency regulation. In other words, it is too case-specific. Therefore, this paper adds some of the new conceptions of the resources and networks. For instance, this paper adds 'technological' resource. This is because technological innovation by the Japanese car firms has been the basis of the fuel efficiency regulations.

Despite these advantages of Policy Network Approach, its weakness should be noted. According to Ansell (2006: 85), network approach tends to produce 'a static and overly structural view of the world not sufficiently sensitive to process, agency, and meaning'. This, in other words, implies that every network is fluid, changes its structure, functions, and agency within its network over time. Therefore, what policy network approach grasp is the 'one shot of the picture' of its fluidity.

By recognizing this weakness, this paper would like to emphasize that the actors and the function of the network has not been changed in the context of Japanese fuel efficiency regulation. However, the implications of resources and the roles of actors may change overtime according to the external events (such as oil shock in 1970s and the agreement of Kyoto Protocol in 1997). Therefore, these external events are needed

to be identified, and seek to link how these external events may affect the resources, roles and strategies of agents within the networks has been changed.

| <b>Type of network</b>                | <b>Characteristic of Network</b>  |
|---------------------------------------|---|
| Policy Community/ territorial network | Stability, highly restricted membership, vertical interdependence, limited horizontal articulation                                |
| Professional network                  | Stability, highly restricted membership, vertical interdependence, limited horizontal articulation, serves interest of profession |
| Intergovernmental network             | Limited membership, limited vertical interdependence, extensive horizontal articulation   |
| Producer network                      | Fluctuating membership, limited vertical interdependence, serves interest of producer   |
| Issue network                         | Unstable, large number of members, limited vertical interdependence   |

**Table 1. Policy community and policy networks: the Rhodes typology** (Rhodes 1997, p.38).

### 3. Japan's fuel efficiency regulations and the car industry

#### 3.1. The fuel efficiency regulation in Japan

In Japan, the CO<sub>2</sub> emission from the transport sector accounts for about 20% of the total Japanese emissions, and about 90% of these are from the use of cars. There are mainly three measures in order to reduce CO<sub>2</sub> emission from this sector: first is the shift to alternative energy (such as to bio-fuels) from the use of fossil fuel; second is to reduce energy intensity of car (namely, raising standards of fuel efficiency standards); the third is to shift to the transportation system that has lower energy intensity (such as the establishment of the sustainable ITS system).

This paper looks at the second policy instrument, namely, the improvement of the fuel efficiency of the cars. This is because, firstly, although Japan is required to reduce emissions of the greenhouse gasses to 6% as compared to 1990 level by 2012 in order to achieve the target set in the Kyoto Protocol, it increases nearly two times from the 1990 level – by now, Japan is required to reduce 13.8% (1990 level) by 2012. Therefore, Japanese government made ‘The Kyoto Protocol Target Achievement Plan’<sup>4</sup> in 2005. In this plan, road transport sector is identified as one of the most important sector in achieving the Kyoto Protocol target for Japan, and, the improvement of the fuel efficiency standards is the essential policy in this sector.

Second, the number of the car ownership in Japan reaches about 80,000,000, and Japan is in the second place in the world below the United States. Furthermore, Japan represents one of the biggest automobile manufactures as of the United States and

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<sup>4</sup> Global Warming Prevention Headquarters of Japanese Cabinet  
<http://www.kantei.go.jp/foreign/policy/kyoto/Gist.pdf> accessed on 13th Aug, 2008.

Germany. Therefore the car industry occupies a position as one of the key industry in Japan as well as in the world (Miyoshi and Tanishita 2008: 2)

Thus, the fuel efficiency regulation has been the central measures both from the view point of the reduction of CO<sub>2</sub> emission as well as for the prosperity of the Japanese car industry.

### **3.2. The history of the Japanese fuel efficiency regulations**

In October 1973, the Fourth Middle East War broke out and it caused so-called the 'first oil crisis'. As a result, it placed a considerable impact upon Japanese economy, since 80% of oil had been imported from Middle East. This encouraged the development of Japanese energy-savings, and the Law Concerning the Rational Use of Energy<sup>5</sup> (Energy Conservation Act) was established in 1976 for the purpose of encouragement of energy-saving in the factory, transportation, building and manufactures. It was the second oil crisis, which advanced Japan to foster the improvement of the energy efficiency. As a result, Energy Conservation Act of 1979 included the fuel efficiency of the car use, and therefore it set the first Japanese car fuel efficiency.

1980s marked the rise of environmental concerns. After the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992, the improvement of the car fuel efficiency has attracted attention from the view point of environmental conservation as well as energy-savings. Accordingly, 1993 marked the new fuel efficiency standard for the gasoline car (target year 2000), and the fuel efficiency standard was placed upon the gasoline freight cars in 1996 (target year 2003).

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<sup>5</sup> The MITI (2007) <http://www.enecho.meti.go.jp/policy/saveenergy/save02.htm> accessed on 13th of Aug, 2008.

After the Kyoto Protocol has adopted in 1997 at COP3, Global Warming Prevention Headquarters of Japanese Cabinet set 'General Rules to Promote the Prevention of Global Warming Measure'<sup>6</sup>, and the Law Concerning the Rational Use of Energy was largely revised in 1998. Most notably, it introduced the 'top runner method'. The top runner method sets the standards based on the most efficient model in a given weight class and then all manufacturers are given time to match it.

In 1999, fuel efficiency standards for both gasoline cars and diesel cars are revised, and it required 22.8% improvement of fuel efficiency of gasoline cars as compared to 1995 level by 2010 (15.1km/L); and 14.9% improvement of fuel efficiency of diesel cars by 2005. Japanese car manufactures achieved 2010 fuel efficiency target of gasoline cars by 2007. As a result, the latest fuel efficiency regulation was introduced in 2007, which requires both gasoline cars and diesel cars 16.8 km/L by 2015<sup>7</sup>, which is equal to 23.5% improvement. (See Table 2 for the history of the Japanese fuel efficiency regulations)

According to Miyoshi and Tanishita (2008: 17), Japanese fuel regulations are set for nine weight classes and have been progressively tightened years by years. In this method, the number of harmonic average is calculated by the volume of shipment of each makers unit in every vehicle weight division, and Japanese car manufacturers are required to fulfil the requirement to be not less than a standard value.

In this sense, it differs from the Corporate Average Fuel Economy (CAFE) regulations in the United States, which is the sales-weighted harmonic mean fuel efficiency average of a manufacturer's fleet of current model year passenger cars or

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<sup>6</sup> Global Warming Prevention Headquarters of Japanese Cabinet

<http://www.kantei.go.jp/jp/singi/ondanka/2002/0319ondantaikou.html> accessed on 13th Aug. 2008.

<sup>7</sup> This target was the strictest in the world until the EU proposed 130g/km in the same year.

light trucks. Therefore, while American car manufactures often take a strategy that they increase the sales of the car model of the light weight in order to clear the requirement, however, Japanese car manufacturers cannot take this strategy since fuel regulations are set for nine weight classes.

| <b>Year</b> | <b>Policies relating to the fuel efficiency regulation</b>   | <b>Target Year</b>                      |
|-------------|--|---|
| 1976        | Energy Conservation Act  |   |
| 1979        | The first fuel efficiency standard for gasoline cars   | 1985                                    |
| 1993        | Revision of fuel efficiency standard for gasoline cars   | 2000                                    |
| 1996        | The fuel efficiency standard for gasoline freight cars   | 2003                                    |
| 1998        | Revision of Energy Conservation Act, introduced Top Runner method  |   |
| 1999        | Revision of the fuel efficiency standard for cars and small freight cars   | Gasoline car(2010)<br>Diesel car (2015) |
| 2003        | The fuel efficiency standard for LP gas cars   | 2010                                    |
| 2006        | The fuel efficiency standard for heavy weight cars (trucks, busses)  | 2015                                    |
| 2007        | Revision of fuel efficiency standard for passenger cars and small freight cars, and new standard for light weight busses | 2015                                    |

**Figure 2. The history of Japanese fuel efficiency regulations (Miyoshi and Taniguchi 2008)**

## 4. Policy Networks in Japanese fuel efficiency regulations

### 4.1. The decision-making process in Japanese fuel efficiency regulations

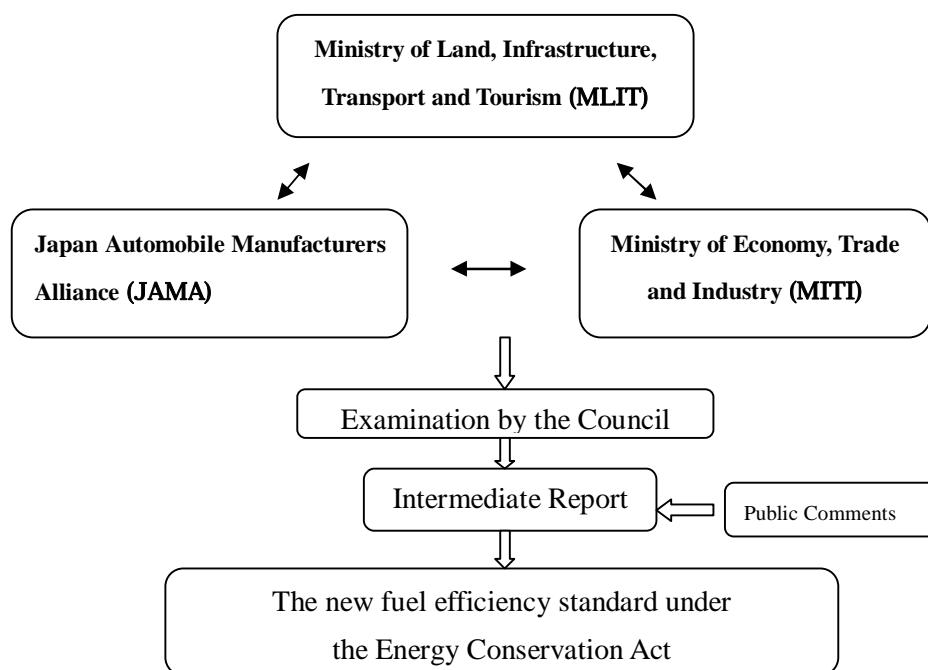
Before we look at policy networks in Japanese fuel efficiency regulations, it is important to outline the characteristics of decision-making process of Japanese environmental policy. According to Schreurs (2003), Japanese environmental policy-making generally takes the form of co-regulation between its government and the industry. In order to change the behaviour of industry, the regulation has been the central policy tool in Japan. Government first show an ambiguous guideline to the industry, and after changes in industry can be observed, government pushes to the stricter regulation.

The case of Japanese fuel efficiency regulation well fits in the above description. According to Miyoshi and Tanishita (2008: 26-27), regulation has been the central policy tool in the Japanese car industrial policy in general, and four Ministries of Japanese government are the main actors involving to the Japanese car industrial policy: Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT); Ministry of Economy, Trade and Industry (MITI); Ministry of the Environment; and the National Police Agency.

In the case of Japanese fuel efficiency regulations, the MLIT and the MITI are responsible for the Japanese fuel efficiency regulations. In the case of 2015 fuel efficiency regulation, these two governmental actors held a series of closed meetings from 2004 until 2006 (2 years), and invite Japanese car industry to participate in these meetings. It is important to note here that Japanese car industry influences this decision

making process via the 'Japan Automobile Manufacturers Alliance' (JAMA), which has been the central network amongst the Japanese car industry.

After a certain agreement has been made in these closed meetings between the MLIT, the MITI and the JAMA, their agreements are passed to the Council for the examination. The member of the Council is chosen from the Japanese academia. After examined by the Council, the agreements are published as the 'Intermediate Report'. The government releases this report to the public and ask for the public comment.<sup>8</sup> If there is not much dissenting opinion, it becomes the new fuel efficiency standard under the Energy Conservation Act.<sup>9</sup> (see figure 1)



**Figure 1. The decision-making process of Japanese fuel efficiency regulations**

<sup>8</sup> The MLIT (2007) [http://www.mlit.go.jp/kisha/kisha06/09/091215\\_.html](http://www.mlit.go.jp/kisha/kisha06/09/091215_.html) accessed on 13th Aug, 2008.

<sup>9</sup> The MITI (2007) <http://www.meti.go.jp/press/20070202008/nenpikijun-p.r.pdf> accessed on 13th Aug, 2008.

#### **4.2. Producer network: JAMA**

As mentioned, Japanese car industry influences this decision making process via the 'Japan Automobile Manufacturers Alliance' (JAMA), which functioned as the central network amongst the Japanese car industry. On the issue of fuel efficiency regulation, preferences of Japanese car manufacturers largely vary on which level should the fuel efficiency standards be. This is because some companies mainly produce big and heavy cars, while others specialize in low displacement cars. Japanese car industries discussed the acceptance level of standards within JAMA. Thus, the JAMA functioned as the convergence of these various opinions. The decision-making of JAMA takes the forms of unanimity.

This network can be identified as the 'producer network' of Rhodes model, which serves as the interest of Japanese car industry. The members of this network comprise of Japanese car Manufacturers. Miyoshi and Tanishita (2008) points out that JAMA plays a central role in the process of the car technology policies in Japan. JAMA sets up three committees, which are particularly important to the Japanese car industry. Under these Committees, sectional meetings are arranged according to the issue areas. Decision-makings are generally made at these sectional meetings.

The decision-making process on fuel efficiency standard is made within the 'secretariat meetings' under the sectional meeting on the fuel efficiency. This Secretariat meeting comprises of around 20 people, those of whom are appointed by the various companies, held almost every weeks. (see figure 2)

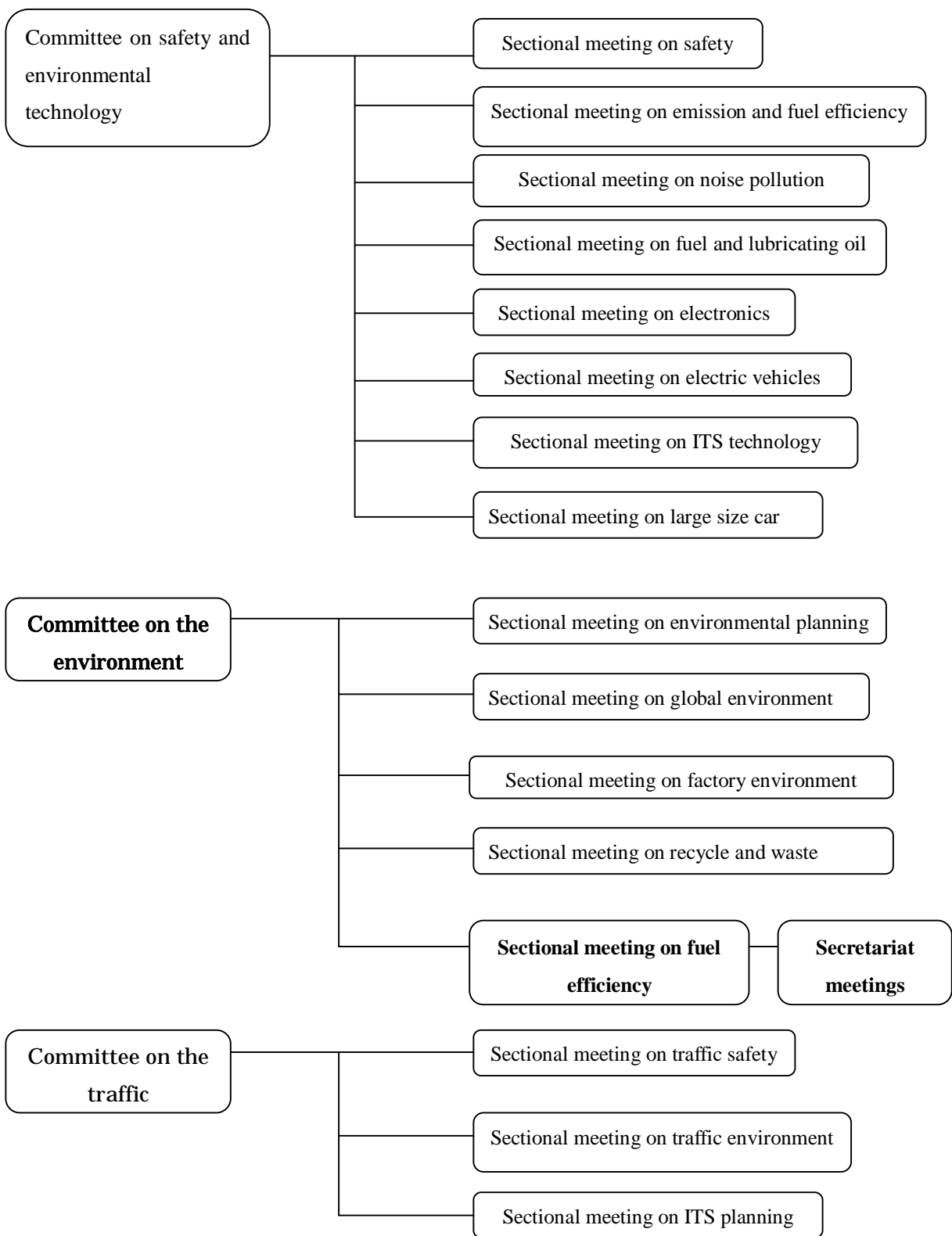


Figure 2. The structure of JAMA (Miyoshi and Tanishita, 2008)

### **4.3. Policy networks in Japan's fuel efficiency regulation**

#### **Policy community**

The main actors within the policy network in Japan's fuel efficiency regulation are the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Ministry of Economy, Trade and Industry (MITI), industrial network amongst Japanese car industry (JAMA), and the Council which members are chosen from the Japanese academia.

The function of this network can be identified as the 'Policy Community' of the Rhodes model. Members are highly restricted, and even the Ministry of the Environment, and NGOs are not participated in this network. Vertical interdependence exists amongst Japanese government and car industry. This network has been very stable, as its decision-making process relating to the settings of fuel efficiency standards has been made by this network. The structure of this network is closed and monopolistic character. The scale of this network is rather large, considering two Japanese Ministries, Japanese car industries as a whole, and experts from academia were involved.

Within this network, the resources of the MLIT can be identified as the 'political power'. It is the MLIT, which is responsible for the promotion of the transportation policies, and thus the discussions relating to fuel efficiency regulation is jurisdiction of the MLIT. The resource of the MITI can be identified as the 'legislative power'. It is the MITI that is responsible for the legislation of the new fuel efficiency standards under the Energy Conservation Act. The resource of JAMA can be identified as the 'technological power' as well as the single voice of the Japanese car industry. The resource of the Council, hence the member of Japanese academia can be identified as

the 'informational power', specifically, 'expertise knowledge on the fuel efficiency regulation and the car technology'. In this sense, it can be said that this power is to authorize or give the legitimacy and accountability to the agreement made between the government and the Japanese car industry.

## 5. Concluding Remarks

This study analysed the policy process of Japanese fuel efficiency regulations from the view point of Policy Network Approach. As a result of this research, this paper emphasises following three findings: first, Japanese fuel efficiency regulations has been decided by the form of 'Co-Regulation' between the state and the car industry; second, Japanese car industry influences this decision making process via the 'Japan Automobile Manufacturers Alliance' (JAMA), which has been the central network amongst the Japanese car industry; finally, governmental network amongst Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Ministry of Economy, Trade and Industry (MITI), industrial network amongst Japanese car industry, and the academic network amongst Japanese academia, have been the central networks which decides the Japanese fuel efficiency regulations.

As the further research question, I would like to extend this research to the comparative politics. Namely, to compare the Japanese fuel efficiency regulation policy process with those of in Germany and the United States. According to Schreurs (2003, p.19), it is important to recognize the member of environmental community largely differs according to the issue area and the political structure of the country. This is because since the degree of cooperation among the environmental NGOs, the leader of the industry, and bureaucrats of the government largely differs between these three countries<sup>10</sup>.

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<sup>10</sup> see John Mikler (2007).

In the end, the climate change politics is becoming to high-politics from the low politics, given the linkage between resource/energy security and climate change politics. Behind of this change, there is a shift from the use of fossil fuel to the use of the renewable fuels. As a result, what emerges is the changing nature of the state strategy to the future climate politics in the following two ways: first, competition and strategy over the acquisition of energy resources (such as biomass and natural gas); second, competition and strategy over the development and the practical use of energy technology (such as wind, solar, the use of biomass, insulation material, low carbon technology). The car industry closely links to this state strategy, and by analyzing the domestic policy process of the transportation sector, this research further seeks to clarify how domestic context matters to the international negotiation.

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