CONTENTS

Energy governance and sectoral trajectories:

France and Japan in evolutionary perspective

6 June 2016, Paris, France

International Workshop organized by
the Fondation France-Japon de l'EHESS, Cardiff University, Michelin

6 June 2016, 9:30 a.m.-6:00 p.m.
Venue: **EHESS**, 190 Avenue de France 75013 Paris, conference room 638-640 – 6th floor

Advance registration is advisable via e-mail to the following address: ffj@ehess.fr

ABOUT THE WORKSHOP

This gathering of scholars and practitioners will allow for the exchange of knowledge about the evolution of the energy sectors in France and Japan. In both countries, government energy policies have been constrained by limited natural resources and reliance on imports. The industry has developed alongside firms who have implemented strategies within a system heavily shaped by the state. The papers presented at the workshop are informed by an evolutionary perspective. This event considers a broader agenda to incorporate historical approaches, and build upon the past in the construction of a greener, sustainable energy future. It involves French and Japanese researchers from a range of disciplines, from management, history, to political science, who will discuss the evolution of the energy industry from through diverse disciplinary approaches. Paris, which was recently the location of the COP21 climate change conference of world leaders, is the ideal location to reflect on the evolution of the energy sectors of these important economies. One of the aims in organising this workshop was to share the research of the presenters with various stakeholders in society.

The first session provides an overview of the current energy sector and current challenges regarding energy transition in both countries. The second session looks at the development of the electricity sector in the two countries from a long-term perspective, since the late 19th century. The third session addresses the subject of innovation in shaping the energy industry over the decades.

We would like to thank the Fondation France Japon de l'EHESS, the École des hautes études en sciences sociales, Cardiff University and Michelin for their support toward this workshop.

Contact and information: Maki Umemura (umemuram@cardiff.ac.uk), Ken Daimaru (ken.daimaru@ehess.fr), Mayuko Yamamoto (mayuko.yamamoto@ehess.fr), Noa Berger (noa.berger@ehess.fr)

PROGRAMME 6 June 2015, 9:30 a.m.-6:00 p.m.

Venue: **EHESS** (190 Avenue de France 75013 Paris, conference room 638-640 – 6th floor)

Morning

9.30-9.45	Introduction and welcome, Sebastien Lechevalier (EHESS) and Patrick Fridenson (EHESS)
Session 1	Chair: Patrick Fridenson (EHESS)
9.50-10.30	**Alexandre Rojey (Fondation Tuck)** The energy transition in France and in the world - Objectives and obstacles
10.35-11.15	**Yukiko Fukasaku (Independent scholar)** The energy transition in Japan – Challenges and opportunities in comparative context
11.20-12.00	**Miyuki Tsuchiya (Université Paris II / Cersa)** Governing energy: the ambiguous link between policy and politic after 3/11. A comparison between France and Japan

Lunch

Afternoon

Session 2	Chair: Maki Umemura (Cardiff University)
13.00-13.40	**Takeo Kikkawa (Tokyo University of Science)** The evolution of Japan's electricity industry since the 20th century
13.45-14.25	**Alain Beltran (CNRS / Université Panthéon-Sorbonne, Paris I)** The history of French electricity since the 20th century
14.30-15.10	**Chenxiao Xia (Kyoto University)** Japanese electrification as contrast with the West

Tea break

Session 3	Chair : Jun Suzuki (National Graduate Institute for Policy Studies/FFJ)
15.35-16.15	**Aleksandra Kobiljski (CNRS / Institut d'Asie Orientale)** Energy workaround: Upgrading coal in Japan's steel industry
16.20-17.00	**Maki Umemura (Cardiff University / FFJ)** Innovation, governance and uncertain shifts in Japan's photovoltaics industry
17.05-17.45	**Christophe Bouneau (Université Bordeaux III Michel de Montaigne)** Governance strategies and innovation dynamics in Power Systems since the Interwar period
17.50-18.00	Concluding remarks

SELECTED ABSTRACTS

Alexandre Rojey (Fondation Tuck)

The energy transition in France and in the world - Objectives and obstacles

Energy represents a key issue in most areas of everyday life. Due to demography and the improvement of life standards, the energy demand has been steadily growing. The primary energy supply is ensured for more than 80% par fossil fuels. An energy transition is required first because fossil fuels resources are limited. As a result the long term supply of energy may become uncertain. It is also needed due to the environmental impact of fossils fuels, especially in terms of CO_2 emissions and climate change. The energy transition will take time, which means that a whole range of options should be considered: reduction of the energy consumption, low carbon energy sources, switches from coal to gas, CO_2 capture and storage. Low carbon energy sources nuclear and renewables both encounter difficulties in substituting fossil fuels. Solar and wind remain still expensive and are intermittent. Therefore new infrastructures, smart grids and storage systems, will be required for a large penetration of these energy sources. France has decided an ambitious policy for moving forward the energy transition and wants to play a leading role in the area of global warming prevention.

Yukiko Fukasaku (Independent scholar)

The energy transition in Japan – Challenges and opportunities in comparative context

Even without looking at data, one can be certain that energy transition is progressing more rapidly in Europe than in Japan. Perhaps not all the European countries are on the fast track but clearly Germany and Denmark; also Italy and Spain are changing its energy mix to one in which renewable energy sources dominate. Even France, with its large nuclear capacity, has adopted the policy to shift at least a part of its nuclear capacity to renewables. Compared to these countries, and despite "Fukushima" as well as its overwhelming dependence of fossil fuel imports, energy transition in Japan is much slower. It is not giving up its nuclear capacity, and fossil fuels continue to account for a significant part of the energy mix. This presentation explores the driving forces and the actual mechanisms behind energy transition in some European countries, especially Germany, and explores why it is so slow in Japan. The challenges and opportunities that both Europe and Japan face, although in different ways, in accelerating energy transition will be discussed.

Miyuki Tsuchiya (Université Paris II / Cersa)

Governing energy: the ambiguous link between policy and politic after 3/11. A comparison between France and Japan

The accident of 3/11 constitutes a focusing event, *« an event that is sudden, relatively rare, can be reasonably defined as harmful or revealing the possibility of potentially greater future harms or suggests the possibility of potentially greater future harms »* (T. Birkland, 1998). It challenges the dominant position of nuclear policy in the energy mix in two highly nuclearised countries, France and Japan. Focusing event is one of the features allowing the opening of a « window of opportunity » (J. Kingdon, 1984). The political alternative represented by renewable energy (RE) replaces RE from a governmental agenda to a decision agenda: the notion of energy transition is now debated and appoints several evolving meanings in those two countries.

In Japan, the notion of energy transition will progressively evolve into different meanings (decreasing nuclear generation and developing RE, strengthening nuclear standards, being one of

the feature of Abenomics program). Thus, it also points to the evolution of stakeholder interaction involved in the nuclear sector (domination of LDP and collusion with industries) and renewable (mainly DPJ and NGO in favor of nuclear decrease). In France, the meaning of the word energy transition seems to be the result of an « ambiguous consensus » (B. Palier 2010) and the lack of a clear agreement between stakeholders.

However for T. Birland, a policy change results from the interpretation of the event made by the dominant stakeholders. During the electoral periods (legislative and presidential in our cases), nuclear energy is a major challenge on which political parties can be distinguished. Fighting for power, political parties will legitimate and define the political space.

From that perspective, the lack of clarity and the polisemy of the word energy transition translate the evolution of stakeholders' interaction. Yet, if a change of political party at a government usually suggests a policy change, the French and Japanese cases during the period studied show that the effect of political alternative must be mitigated. We can then wonder which failure and success can explain the change or the lack of change in energy policy in France and Japan. This is therefore the articulation between policy and politics that must be analysed here. "

Takeo Kikkawa (Tokyo University of Science)

The evolution of Japan's electricity industry since the 20th century

The nuclear accident at Tokyo Electric Power's Fukushima Daiichi Nuclear Power Plant, in the wake of the Great East Japan Earthquake on March 11, 2011 has prompted Japan to fundamentally review its entire energy policy. With the review still ongoing, levels of public interest in the energy industry are at an all-time high. If such a serious accident can occur, then surely Japan's electric power industry and nuclear power policy need to change. At the same time, however, merely condemning the government and Tokyo Electric Power (TEPCO) is no way to bring about constructive reform. With that in mind, the aim of this paper is to set out a positive direction for the electricity industry and nuclear power reform.

To resolve issues facing any industry, you need to start by applying the right principles and theories, whilst also taking into account the historical context. This paper uses the method of "applied business theory" in order to do just that.

Applied business history is about identifying the dynamism of industrial and corporate growth through the study of business history and, based on the findings, exploring solutions to contemporary problems encountered by the relevant industry and companies. Analysis with an applied business history approach uses the following procedures.

1. Clarify the context of the industries and companies encountering the problems
2. Consider historical context in trying to identify the essence of the problems
3. Discover the latent dynamism of growth (which has not become obvious in many cases) in the relevant industry and companies, a driving force for solving the problems
4. Based on 1-3, and as much as possible, have a concrete view of the path to solving the problems encountered by the relevant industry and companies.

In accordance with steps 1-4, this paper discusses the path for Japan's electricity industry to become more resilient. Following a brief look at the dynamic development of Japan's energy industry from the 1880s onwards, we will take a look at the best options for restructuring the electricity industry and reforming Japan's nuclear power policy.

Chenxiao Xia (Kyoto University)

Japanese electrification as contrast with the West

What are the different patterns of electrification in capitalistic societies and why do they differ? This paper answer these questions from a comparative perspective, using Germany and United States as case of western electrification and Japan as case of non-western electrification.

Although electricity industry started at about the same time in the 1880s in both Japan and western countries, Japanese electrification was unique in many aspects. (1) Japan electrified itself faster than most western countries; (2) private ownership, a common form of electrical business in western societies, was not only more complete in Japan, but also appeared late and was weak there; (3) regulation on electric utilities appeared late in Japan, despite that as was the same in western societies, electric utility was natural monopoly and electric enterprises built distribution systems on public or private lands they do not own; (4) the regulation model of municipal franchise had to be imported from western societies, especially Germany, to Japan—fruitlessly; (5) Japan evolved towards a regulation model in which the central government would bypasses local authorities in regulating utilities, while in western countries, the regulation model was a pile-up structure in which central and local governments both played their role. By the 1930s, despite that electrification rate in major capitalistic societies converged and that electric utilities became big business that substantially contributed to growth, the difference in organizational form, regulation structure, and inter-firm relation in Japan and western would form a 'great divergence' that would never be the same, even in the 21st century.

The cause of this 'great divergence' lies in not only a difference in initial conditions of electrification: the legal-political structure in western countries and Japan were quite un-similar in the 1880s-1890s. The cause of this 'great divergence' lies also in a different interplay in the check-and-balance of private utilities, local government, and central government in different cultures from the 1900s to the 1930s. Despite that western legal ideals and regulation models were introduced into Japan, they were 'Japanalized' in a non-western social-political context. Technology and business model could move across cultures, but the social-political norms surrounding them could never be transferred from one culture to another without modification.

Aleksandra Kobiljski (CNRS / Institut d'Asie Orientale)

Energy workaround: Upgrading coal in Japan's steel industry

That Japan is a small island nation poor in natural resources was an expression reflecting anxieties of inter-war Japanese bureaucrats about the economic development of Japan, often serving as the implicit backing of colonial expansion. Yet miners, foremen, and engineers in Meiji Japan could not grapple with the speed with which new mines were opening and old pits deepened.

Looking at the case of coke manufacturing for steel industry from 1897-1905, I argue that poverty in coal was little more than discursive posing while the principal energetic challenge of Meiji industrialization elsewhere. In the case of steel industry, the question was not whether Japan did or did not have coal but what kind of coal could it produce. For on-and-under ground actors of Meiji industrialization, coal was not a natural resource but a manufactured product. Having coal was not a straightforward matter of geological lottery but a result of a hard work of devising workarounds.
.

Maki Umemura (Cardiff University / FFJ)

Innovation, governance and uncertain shifts in Japan's photovoltaics industry

This paper is an outgrowth of my current research on government policies and the evolution of frontier industries, such as photovoltaics. Following the oil shocks of the 1970s, the Japanese government introduced various policies to support the realization of alternative "green" energy sources as a potential means to secure energy supplies. Photovoltaics came to be considered one potential alternative under a famous "Sunshine Project" launched in 1973. The combination of subsequent government policies; networks of collaboration between industry and academia; and consumer interest, launched Japan into one of the largest photovoltaic markets between the mid 1990s and 2000s, represented by leading global companies such as Kyocera and Sharp. While the reversal of government policies to re-initiate support for photovoltaics stimulated growth in this sector after the Fukushima incident in 2011, enduring concerns regarding photovoltaic prices, energy efficiency, and stable supply prevented wider penetration of photovoltaics.

In this context, my paper builds upon the growing body of literature on strategic niche management and sociotechnical transitions. In response to the often supply-driven analyses in innovation studies, strategic niche management has focused on how interactions with actors and institutions in the broader sociotechnical system are crucial to the development of a successful niche. The paper also builds on recent works that consider ideas of the future, whether "predictions" or "expectations" (management); "sociotechnical imaginaries" (science and technology studies); or histories of the future (history). It focuses on predictions, forecasts, and expectations and seeks to investigate the extent to which industry actors shared the same vision of the future. The paper uses the experience of the Japanese photovoltaics (PV) industry to consider how shared visions of the future shape the development of a vibrant niche. In so doing, it considers the extent to which a successful niche – as seeds of sociotechnical transitions – are also dependent on shared visions of the future.

Christophe Bouneau (Université Bordeaux Montaigne,

Président du Conseil scientifique de l'Association académique de recherche en histoire et sociologie de l'énergie (AARHSE-FNCCR))

Governance strategies and innovation dynamics in Power Systems since the Interwar period

This contribution aims suggesting an interdisciplinary theoretical frame, providing tools for innovative research focusing on industrial trajectories of the energy sector, especially electrification and power systems around the concept of interconnection, combining regional, national, European and international stages, scales and stakes. It is fed by the results of two transversal research programs led within the Maison des sciences de l'Homme d'Aquitaine, the first one on *The Spatial Logics of Innovation* and the second one on *The Trajectories of Innovation*. Combining within the field of social sciences of innovation on one hand a spatial and systemic analysis and on the other hand a diachronic and historical perspective can be very fruitful. It allows emphasizing types of proximity, the building process of economic and social networks, the emergence and at the same time the permanent crisis of regional systems of innovation. As an historian, the challenge remains determining the "small events", the bifurcations, the lockouts and irreversibility processes, pointing out the crucial question of uncertainty regimes and its impossible management.

As working hypothesis we assume that European history of networks refers to a spatial process continually articulating regional, national and international scales since the middle of 19th century to nowadays. Beyond luddism, local and regional resistances to international transfers of

technologies and so to the integration into the international process of industrialization often occurred. Within international dynamics of their expansion, we have to consider three types of reconfiguration of European networks: the territorial spread and interconnection of similar systems across political borders; the crossing of functional system boundaries; and the reorganization of former monopoly systems into new configurations based on principles of competition and free access.

Among the tensions between standardization and upholding of specific styles appears, as a global interdisciplinary field of research, the key role of international professional organizations articulating regional, national and international levels in the governance of networks. Sometimes the large scale of a network does not mainly refer to its geographical size, it refers to immaterial means, including especially international professional cooperation required in particular for the definition of standards. The competition for patents at international level is not the only economic indicator in this field. Normalization, led by international associations which represent professional communities, i.e. precisely *Commission Electrotechnique Internationale, Union Internationale des Producteurs et Distributeurs d'Electricité, Conférence Internationale des Grands Réseaux Electriques,* became gradually an important way towards the international regulation of innovation. Behind the concepts of internationalisation, multinationalisation and globalisation and beside the permanent struggle between transnational firms, we find the weaving of international professional communities and networks too. Since the Second World War, even before the fall of the Berlin wall, this logic considerably increased for the governance of transportation and power networks. This international cooperation imparted new nobility to engineers and experts, without succumbing to scientist and worldwide technological utopias as nevertheless this hidden side of European construction/integration is subordinated to political and geostrategic decisions, especially during the Cold War.

Addressing Techno-Politics, which despite the growing influence of consumers and citizens movements (mainly in terms of communication) constitutes the core of the so-called technical democracy, needs crossing the OMR (Operators, Manufacturers, Regulators) Triangle with a RNI Triangle (Regional, National and International). We must address the tensions between the governance of technological networks in European countries since the end of the XIXth century and the spatial dynamics combining regional, national and international scales. This contribution will emphasize the key period 1950s-1990s considering two organizational case studies through the global trajectory of *CIGRE* and *UCPTE*.

SPEAKERS

Alexandre Rojey (Fondation Tuck)

Yukiko Fukasaku (Independent scholar)

Miyuki Tsuchiya (Université Paris II / Cersa)

Takeo Kikkawa (Tokyo University of Science)

Alain Beltran (CNRS / Université Panthéon-Sorbonne, Paris I)

Chenxiao Xia (Kyoto University)

Aleksandra Kobiljski (CNRS / Institut d'Asie Orientale)

Maki Umemura (Cardiff University / FFJ)

Christophe Bouneau (Université Bordeaux III Michel de Montaigne)