CSTI Science Technology Innovation Policy

Towards a New Industrial Structure Vision?

Issues on Japan's Industrial Policy

FIRST INTERNATIONAL ST&I POLICY FORUM

FORUM SUMMARY | 18 NOVEMBER 2013

IfM MANAGEMENT TECHNOLOGY POLICY

UNIVERSITY OF CAMBRIDGE

Centre for Science, Technology & Innovation Policy (CSTI), University of Cambridge

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Rapporteur: Carlos López-Gómez

About the International ST&I Policy Forums

A new series of policy forums that will contrast international approaches to industrial policy

The International Science, Technology & Industrial Policy Forums aims at bringing together researchers and policy makers from across the UK – and beyond – with a shared interest in manufacturing industries and industrial policy.

The forums will contrast policy contexts in important manufacturing countries, including Germany, Japan, Singapore and UK. Emphasis will be placed on characterising key elements of these countries' national contexts, including:

- Industrial policies and policy tradition
- National industrial structures and corporate governance practices
- Institutional infrastructure supporting policy formulation and implementation

The forums will be hosted from November 2013 at the Institute for Manufacturing, University of Cambridge, providing a space to disseminate and discuss research results, identify emerging common themes, and ensure research relevance to practitioners.

UPCOMING FORUMS

SECOND INTERNATIONAL ST&I POLICY FORUM :

Turning a Goldfish into Dragon: Issues on Singapore's Industrial Policy
February 2014

THIRD INTERNATIONAL ST&I POLICY FORUM :

Not So Hidden Champions: Issues on Germany's Industrial Policy
April 2014

FOURTH INTERNATIONAL ST&I POLICY FORUM :

Issues on South Korea's Industrial Policy
Date tbc

Overview of the Japan Policy Forum

The first International Science, Technology & Industrial Policy Forum "Towards a New Industrial Structure Vision? Issues on Japan's Industrial Policy", hosted on 18 November 2013, served as a platform to analyse and contrast Japan's industrial policies and its national policy context. Emphasis was placed on three themes: challenges associated with industrial structures and corporate governance practices, recent changes in Japan's approach to industrial policy, and industrial policy-relevant institutions. The forum participants also reflected upon some of the new challenges to industrial policymaking driven by the increasing complexity of the manufacturing activity and its global configuration. The following is a summary of the forum discussions. Opinions were expressed by participants in a personal capacity and therefore do not represent the official views of their institutions.

Challenges associated with industrial structures and corporate governance practices in Japanese industries

Besides the so-called 'six-fold agonies' affecting the Japanese economy (yen appreciation, high corporate tax, delayed trade agreements, 'heavy employment rule', environmental restrictions, and unstable electricity supply), Japanese industries, it has been argued, face a number of challenges owing to their industrial structures and corporate governance practices. Particularly, a number of these challenges have been associated with Japan´s keiretsu structures – traditional forms of corporate structure in which a number of organisations link together through cross shareholding, supplier-client relationships, and other economic ties. Such challenges include: restrictions to hire and fire, difficulties to develop radical innovations, and inability to acquire or dispose of companies.

Furthermore, it was been argued that SMEs in keiretsu structures tend to be excessively inward oriented, which has in turn resulted in their inability to capture opportunities in foreign markets despite "dominance" in range of technologies/capabilities. Moreover, a perceived reluctance to consolidate has resulted in excessive domestic competition in a number of industries. In areas of the telecommunication equipment, semiconductors, chemicals and cement industries, the profitability of Japanese companies is as low as half of that of competitors in other countries. Similarly, it is estimated that the business start-up rate in Japan is half of that in the US and UK.

Yet despite the perception that keiretsu structures tend to inhibit consolidation, there is evidence of mergers that have taken place across keiretsu boundaries. Moreover, it has been argued that relational contracting associated with keiretsu structures may ensure long-term investment finance in manufacturing and encourage commitment to innovation. Thus, keiretsu structures may play an important role in ensuring the future sustainability of Japanese manufacturing industries.

Recent changes in Japan's approach to industrial policy

As a response to the perceived challenges to Japanese industries, the government has in the last few years pledged to, among other priorities, promote industrial consolidation and business restructuring and increase the business start-up rate.

A number of initiatives and laws a have been established in Japan after 2000, including the Law on Special Measures on Industrial Revitalization, the Energy Conservation: Top Runner Program, the Innovation Network Corporation of Japan (INCJ) and the Eco-point Program and Eco-car Subsidy. The Law on Special Measures on Industrial Revitalization, introduced in 2001, is particularly representative of recent policy approaches to industrial policy in Japan. Through tax incentives and financial assistance, the Law has promoted firm restructuring in the retail, steel and financial sectors. As of October 2013, it has already been applied to over 400 firms. Whereas, the INCJ was conceived as a risk capital provider and start-up 'catalyser'.

Additionally, at least five growth strategies have been published over the last decade. Drafting the growth strategies has become an important mission of the Ministry of Economy, Trade and Industry (METI) after its reorganisation in 2001. In the latest growth strategy, Prime Minister Abe introduced his economic policy package, so-called Abenomics, which includes 'three arrows': aggressive monetary policy, flexible fiscal policy, and structural reform aimed at boosting private investment. Abe's strategy has indicated that, in order to boost competitiveness of Japanese industries, new policies will be required across the areas of tax, foreign trade agreements, labour regulation, agriculture market, and the medical and welfare systems.

Furthermore, Japan has also recently set itself the target to increase infrastructure sales threefold. Pledging to follow the same approach used to secure recent deals on railways in the UK, nuclear power in Turkey and infrastructure in India, top-level diplomacy sales are to be increasingly pursued.

Another recent perceived change in industrial policy in Japan is the reduction of policy tools following deregulation and administrative reforms. Due to changes in funding, the influence of METI on the agenda of prefectural industrial research institutes has been reduced.

Industrial policy-relevant institutions in Japan

The Japanese state assumed a developmental role after WWII, during a period in which the Ministry of International Trade and Industry (MITI) acting as one of the leading actors in the economy. In 2001, MITI was reorganised into the METI – a reform that some commentators have associated with a move towards a more horizontal approach to industrial policy. In recent years, however, the government has recognised the need to assume a more active role in order to strengthen the competitiveness of Japanese industries.

Besides METI, the activities of other institutions are also relevant to industrial policy in Japan, including those of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the National Institute of Advanced Industrial Science and Technology (AIST), the New Energy and Industrial Technology Development Organization (NEDO), the Institute of Physical and Chemical Research (RIKEN), and the Japan Science and Technology Agency (JST).

Furthermore, a number of initiatives and institutions at the regional and prefectural level complement those found at the national level. One representative example is that of the public industrial technology research institutes, or kohsetsushi centres, which operate in each of Japan's 47 prefectures. Their main areas of activity include: technical advice, consultation and training; product testing and evaluation; and joint and commissioned R&D. Recent reductions in government funding to this research institutes, however, have resulted in decreased government influence in their management.

General discussion: Policy evidence and dialogue needs

The forum participants also addressed general challenges to contemporary industrial policy. There was discussion about the increasingly complex nature of the manufacturing activity due to, for example, multi-level interdependencies in value chains, wide geographical dispersion, and rapid technological change. As a result, the difficulties to gather policy evidence have also increased.

New technological and political developments that increase traceability and transparency in the value chain may offer new sources of data, thus enabling a better understanding of manufacturing industries. Such knowledge may provide the policy evidence necessary to address the risks of government failure.

Finally, the need for platforms of engagement, such as this forum, that enables interaction between policy makers and researchers was highlighted. The combination of perspectives has proved useful to highlight common challenges and interests, as well as research opportunities.

OPENING SESSION

What is New in the New Industrial Policy?

Dr Eoin O'Sullivan *Director, Centre for Science, Technology & Innovation Policy, University of Cambridge*

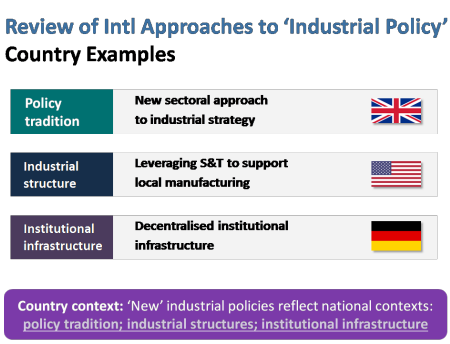
Dr Carlos López-Gómez *Research Associate, Centre for Science, Technology & Innovation Policy, University of Cambridge*

Setting the context for the forum, this joint presentation provided an overview of the recent evolution of manufacturing-related policies in selected OECD economies – Germany, Japan, UK and US.

Dr O'Sullivan highlighted some of the difficulties in comparing national approaches to industrial policy, including disparities in definitions and the wide range of policies potentially relevant to manufacturing industries. He argued that a 'manufacturing systems perspective' can help improve understanding of national manufacturing competitiveness and approaches to industrial policies by better accounting for the complexity of modern manufacturing.

Discussing research recently conducted at CSTI[1] which compared policy approaches in terms of factor inputs focus, intervention levels and degrees of coordination, Dr O'Sullivan argued that an emerging consensus can be identified in terms of a number of functions/ qualities of appropriate 'industrial policy', including:

- Coordination of manufacturing-related policy measures: including convening power of government to enhance alignment/ awareness among industry actors
- 'Partnership' with industry: in designing manufacturing-support programmes, particularly for gathering information on competitiveness challenges.
- Longer term investment and planning: in ensuring government efforts to nurture an environment conducive to manufacturing-related investment commensurate with longer term strategies of firms



Dr O'Sullivan emphasised the importance of framing any policy analysis by exploring the national context in which they operate, particularly in terms of policy tradition, industrial structures, and institutional infrastructure. The relevance of these dimensions was illustrated by contrasting particular features identified in recent industrial policy approaches in the UK, US and Germany.

Finally, Dr López-Gómez described some features of Japan's approach to industrial policy. He argued that Japan's recent policy agenda has involved a range of measures focused, in particular, on: (a) improving Japan's overall attractiveness as a manufacturing location; (b) supporting the deployment of Japan's technologies, products, engineering services to world markets (in particular SMEs); and (c) addressing energy supply shortages.

He concluded by posing a number of questions for discussion during the forum, including:

- How are industry-related policy initiatives coordinated by government in Japan?
- What, in Japan, is considered to be the role of government in influencing industrial structure and corporate governance?
- How do regional institutions such as prefectural industrial research institutes, or kohsetsushi centres, fit in the national 'institutional infrastructure'?

[1] O'Sullivan, E., Andreoni, A., López-Gómez, C., & Gregory, M. (2013). What is new in the new industrial policy? A manufacturing systems perspective. *Oxford Review of Economic Policy, 29*(2), 432–462.

JAPAN SESSION ONE

Recent Industrial Policies in Japan

Yuki Sadamitsu *Japan External Trade Organization (JETRO) London*

This session provided an overview of recent industrial policies in Japan from a practitioner's perspective, with emphasis on initiatives at the national level. Key challenges faced by Japanese manufacturing industries were highlighted and insights into policymaking in Japan were offered.

Mr Sadamitsu started off by referring to Professor Ohashi's[2] characterisation of three 'historical shifts' in Japanese industrial policy:

- 1940- 1960s: Trade protection and promotion of heavy industries. During this period of 'heavy handed' industrial policy, the main policy objective was to catch up with Western countries. Excess competition was discouraged and scale was pursued.
- 1970-1990s: Industrial structural transition by foreign pressure. Following its industrial take-off, Japan was criticised for its high saving rate and large trade surplus. In response, import restrictions were removed, and measures to boost domestic demand were established.
- 2000- : Lost decades and endogenous structural reform. From the 2000s, the new METI expanded its remit to deal with cross-sector economic structural reform to enhance market function. Emphasis was placed on competitiveness and innovation.

After 2000, Mr Sadamitsu explained, a number of key drivers influenced industrial policy in Japan, including: economic pressures 'legacy' of the financial crisis in the late 1990s, labour population decline, and the push towards a low carbon society. Similarly, Japanese policy was influenced by calls for a stronger innovation policy to recover manufacturing in the US, as well as the rise of China and Korea. (Korea's success in a nuclear deal in the UAE was perceived as a shock in Japan).In addition, by the end of the 2000s, Japanese industries faced the so-called 'six-fold agonies': yen appreciation, high corporate tax, delayed FTA talks, 'heavy employment rule', environmental restrictions, and unstable electricity supply.

Mr Sadamitsu went on to discuss major industry-relevant policy initiatives after 2000:

Law on Special Measures on Ind. Revitalization	Introduced in 2001 with the aim of alleviating excess debt and capacity, the law promotes company restructuring by providing tax incentives and financial assistance. It has been applied to over 400 firms as of October 2013.
Growth Strategies	These strategies are driven by the PM and offer guidelines for budget allocation across government. At least five growth strategies have been published after 2000. Drafting these strategies has become important part of METI's work.
Energy conservation: Top runner program	Introduced in 1998, it focuses on tackling climate change by setting future energy efficiency goal for 26 products, based upon high-performance market benchmark.
Innovation Network Corporation of Japan (INCJ)	Launched in 2001, this semi-public investment company aims at promoting the creation of next-generation businesses through 'open innovation'. It has invested over 360 bn yen in about 40 companies.
Eco-point Program and Eco-car Subsidy	Launched from 2009, the programmes aimed at boosting consumption of energy-efficient products and transition into low carbon society. Around 1.6 trillion yen, or over £10 bn, were spent, benefiting the electronics and automobile industry.

After taking office last December, Mr Sadamitsu explained, Prime Minister Abe introduced his economic policy package, so-called Abenomics, which includes 'three arrows': aggressive monetary policy, flexible fiscal policy, and structural reform to boost private investment through the growth strategy.

Mr Sadamitsu concluded his presentation by arguing that industrial policymaking has become increasingly challenging due to, among other factors, globalisation and rapid technological advancement which have made information gathering and forecasting more difficult.

[2]Discussion paper for RIETI conference on "Globalization and transformation of industrial policy" by Hiroshi Ohashi, Professor of Tokyo University, January 2013.

JAPAN SESSION TWO

Japan's Industrial Structure – Beyond Keiretsu?

Mari Sako and Steve New *Saïd Business School, University of Oxford*

This session addressed the influence of corporate structures and corporate governance on the international competitiveness of Japanese industries.

Professor Sako introduced some of the main features and recent trends in Japan's traditional industrial structures, namely vertical and horizontal keiretsu structures. She pointed out that, contrary to common perception, horizontal and vertical keiretsu exhibit linkages with varying degrees of strength (see figure on the left).

Moreover, the pyramid shape representation typically used to describe vertical keiretsu has not been very accurate . This type of keiretsu are, in fact, characterised by a relatively closed inner group and a more open outer circle of suppliers and have recently moved towards more open trading.

A recent trend in horizontal keiretsu, Professor Sako explained, has been the dramatic increase in foreigner shareholding. There has also been a pronounced decline in shareholding by banks and a more moderate decline in business corporations cross-shareholding. Some of the reasons of this 'unravelling' of horizontal keiretsu include increased consolidation (M&A), especially in banking, as well as changes in accounting rules introduced in 2001 which triggered cross-held share selling.

Professor Sako emphasised the role of long-term committed contractual relationships with workers (lifetime employment) and suppliers in enabling commitment to incremental innovation and ensuring investment finance in manufacturing. She argued that despite the potential downsides faced by firms which are part of keiretsu structures (including difficulties to hire and fire, develop radical innovations, and acquire or dispose of companies), relational contracting in keiretsu structures plays an important role in ensuring the future sustainability of Japanese manufacturing industries.

In his presentation, Dr New focused primarily on vertical keiretsu. He argued that the structures of modern value chains are not fully captured by representations commonly found in the literature. Drawing from research conducted alongside his colleagues , in which they make use of novel mapping techniques and data sources, Dr New offered insights into how these structures may actually look like (see figure on the left).

He offered examples from Toyota, whose value chain he described as having a complex but relatively stable with a 'barrel-like pattern', i.e. many suppliers in tier two and three and fewer in lower ones.

Dr New concluded by arguing that industrial policy formulation without understanding of what he called 'supply chain topological microstructure' may lead to dysfunctional interventions. However, new technological and political developments in supply chain traceability and transparency may provide improved policy evidence.

[3]Professor Sako addressed this point in earlier work, including: Sako, M. (1996). Suppliers' associations in the Japanese automobile industry: collective action for technology diffusion. *Cambridge Journal of Economics, 20*(6), 651–671.

[4]Brintrup, Alexandra, Kito, Tomomi, Reed-Tsochas, Felix and New, Steve (2011) Mapping the Toyota Supply Network: Implications for Resilience. Institute for Operations Research and the Management Sciences (I N F O R M S), *Management Science*. (Submitted)

JAPAN SESSION THREE

Japan's Institutional Infrastructure – Is METI Alone?

Dr Hiro Izushi *Aston Business School, Aston University*

This final session focused on the role of institutions providing support to manufacturing firms at the metropolitan/regional level, as well as their relationship with the Ministry of Economy, Trade and Industry (METI).

Dr Izushi focused on the role of public local technology centres in Japan, known as kohsetsushi centres[5]. Having been established as sector-based testing stations and extension services for local industry around 1900, they gained some research capacity in the following decades. After WWII these local technology centres spread to each of the country's 47 prefectures. The centres are funded by prefectural and municipal governments, with some degree of supervision by national-level ministries.

Key Profile

- Over 600 public local technology centres
- Approximately 130 are manufacturing-related (Small and Medium Enterprise Agency, 2005)
- Number of employees range from less than 10 to over 200
- Of technical staff members, 23% have a doctoral degree (Japan Association for the Advancement of Research Cooperation, 2011)

Dr Izushi explained that out of the total of over 600 public local technology centres in Japan today, around 130 are related to manufacturing. Their main areas of activity include: technical advice, consultation and training; product testing and evaluation; and R&D including joint or commissioned research.

Dr Izushi distinguished between 'low Information gap services' and 'high Information gap services'. The former include product testing and evaluation, and open use of testing and evaluation equipment by users on their own; the latter include technical advice and guidance, engineer training, lectures and workshops, and joint or commissioned research.

Public local technology centres, Dr Izushi explained, have been affected by a 16% reduction in local government funding since 2000. There has also been a trend towards 'semi-privatisation', which has resulted in changes in their management structures, including the appointment of directors from the private sector.

Dr Izushi concluded by arguing that given recent funding reductions, local technology centres are confronted with more strategic choices and might need to adopt a more selective focus. Moreover, given the increased involvement of private firms in the centres' management, it can be argued that policy tools available to government have been reduced.

[5]See Izushi, H. (2005) 'Creation of relational assets through 'library of equipment' model: industrial modernisation approach of Japan's local technology centres', *Entrepreneurship and Regional Development, 17*(3), 183–204.

APPENDIX A

Forum Agenda

Towards a New Industrial Structure Vision?

Issues on Japan's Industrial Policy

November 18, 2013 | Institute for Manufacturing, 17 Charles Babbage Road, Cambridge, CB3 0FS, UK

12.30 Welcome Lunch and Introductions

13.00 OPENING SESSION:

What is New in the New Industrial Policy?
Eoin O'Sullivan and Carlos López-Gómez, Centre for Science, Technology & Innovation Policy (CSTI), University of Cambridge

13.30 JAPAN SESSION ONE:

Recent Industrial Policies in Japan
Yuki Sadamitsu, Japan External Trade Organization (JETRO) London

14.10 Discussion

14.30 Break & Refreshments

14.45 JAPAN SESSION TWO:

Japan's Industrial Structure – Beyond Keiretsu?
Mari Sako and Steve New, Saïd Business School, University of Oxford

15.40 Discussion

16.00 JAPAN SESSION THREE:

Japan's Institutional Infrastructure – Is METI Alone?
Dr Hiro Izushi, Aston Business School, Aston University

16.40 Discussion

17.00 Wrap-up and Final Discussion

17.30 Networking and Drinks

Japan sessions chair: Dr Fumi Kitagawa, Manchester University

APPENDIX B

Speaker Biographies

Yuki Sadamitsu has been a Director of Europe, the Middle East and Africa (EMEA) Industry & Energy, JETRO London since August 2012. He is also a Special Advisor to Ministry of Economy, Trade and Industry (METI).

Before moving to London, he was Director of Energy Strategy Office of METI from 2009 to 2012. He was involved with formulating Japanese energy strategy both before and after Fukushima nuclear accident. He was also in charge of introducing the first carbon tax in Japan. He also worked in Cabinet Office and Miyagi Prefectural Government.

Born in Osaka in 1969, he obtained Bachelor of Laws from the University of Tokyo and Master in Public Administration from Kennedy School of Government, Harvard University.

Mari Sako is Professor of Management Studies at Saïd Business School, Co-Director of the Novak Druce Centre for Professional Service Firms and a Professorial Fellow of New College, Oxford.

With over 20 years' research in the area of global strategy, Mari earlier made a significant contribution to the understanding of the Japanese economy and Japanese firms. In the 1990s and 2000s, she was a researcher for the MIT International Motor Vehicle Program (IMVP), which gave her a valuable opportunity to be out in the field, observing and interviewing managers and workers at automakers in Japan, Europe and the USA. Drawing on lessons from the Japanese model, she then worked with a number of firms to reconfigure their supplier relationship management. She has also investigated outsourcing and its impact on productivity. Her work on this area has been mentioned in the Economist, the Financial Times, the Times, and the Economic Times of India.

Steve New is University Lecturer in Operations Management at Saïd Business School and Fellow of Hertford College at the University of Oxford. His areas of expertise include supply chain management and process improvement

His research looks at the nuance and complexity of the so called 'lean production' or 'just-in-time' manufacturing process, its application to different sectors and how few have managed to emulate Toyota's model. Steve serves on the Editorial Review Board for the Journal of Purchasing and Supply Management, and the Editorial Advisory Board for Supply Chain Management: an International Journal.

Hiro Izushi is Senior Lecturer at the Economics and Strategy Group, Aston Business School. His major fields of research include Technological Innovation and Regional Economic Development.

Hiro's recent research projects include an OECD project on the concentration of innovation-related resources in leading regions across the globe; a NESTA project on international knowledge sourcing practices of small firms in the UK; as well as a visiting position at Hannan University in Osaka, Japan to work on a study of small and medium-sized enterprises in Kansai region.

He received the Nitobe Fellowship for Japanese Social Scientists, International House of Japan and holds a PhD form the University of California at Berkeley.

Eoin O'Sullivan is the director of the Centre for Science, Technology & Innovation Policy (CSTI), University of Cambridge.

Eoin's policy-related activities have included studies for the UK Department of Business, Innovation & Skills; the Engineering & Physical Sciences Research Council; the UK Government Office of Science; the Technology Strategy Board; and the Higher Education Funding Council of England. Before joining the IfM, Eoin was Special Advisor to the Director General of Science Foundation Ireland. Eoin was part of the original team that set up SFI. He was both a Senior Policy Advisor at Forfas, The Irish National Policy & Advisory Board for Enterprise, Trade, Science, Technology & Innovation and a Senior Programme Officer for Information & Communications Technologies at the Foundation. Eoin has a D.Phil. from the Physics Department of Oxford University.

Carlos López-Gómez is a research associate at the Centre for Science, Technology & Innovation Policy (CSTI), University of Cambridge. He formerly worked in the automotive and engineering service industries, both in Mexico and the US.

His current research focuses on manufacturing strategies and industrial policies, with emphasis on the aerospace and software industries in East Asia and Europe. He has over the last years collaborated with institutions such as the United Nations Industrial Development Organisation (UNIDO) and the European Commission. Carlos holds a PhD from the Engineering Department of Cambridge University.

APPENDIX C

List of Participants

Dr Antonio Andreoni
CSTI
University of Cambridge

Tomas Coates Ulrichsen
CSTI
University of Cambridge

Miles Dodd
Morimatsu Group
Shanghai

Charles Featherston
CSTI
University of Cambridge

Jostein Hauge
Centre for Development Studies
University of Cambridge

Jae-Yun Ho
CSTI
University of Cambridge

Dr Hiro Izushi
Aston Business School
Aston University

Dr Fumi Kitagawa
Manchester Business School

David Leal
Engineering Department
University of Cambridge

Kyounglim Lee
CTM
University of Cambridge

Weon-Vin Lee
University of Cambridge

Dr Carlos López-Gómez
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Vasiliki Mavroeidi
Centre for Development Studies
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Dr Tim Minshall
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Natalya Naqvi
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Dr Steve New
Saïd Business School
University of Oxford

Atsushi Oku
First Secretary (Science and Technology)
Embassy of Japan

Dr Eoin O'Sullivan
CSTI
University of Cambridge

Jae-Hwan Park
Centre for Industrial Sustainability
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Professor Robert Rowthorn
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Sonja Ruehl
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Yuki Sadamitsu
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Professor Mari Sako
Saïd Business School
University of Oxford

Dr Hiram Samel
Saïd Business School
University of Oxford

Joao Silva
Centre for Development Studies
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Sarah Teasley
Royal College of Art

Bill Wicksteed
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Ning Yang
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