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TRADE LAW CLINIC

Geneva, June 13 2011

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**Issues and tensions in public procurement of ‘green
innovation’: A cross-country study.¹**

Final Report

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List of Abbreviations and Acronyms

ASEAN	Association of South East Asian Nations
EC	European Community
EU	European Union
GATT	General Agreement on Trade and Tariffs
GATS	General Agreement on Trade in Services
GPA	Public procurement Agreement
GPS	Global Positioning System
NAFTA	North American Free Trade Agreement
OECD	Organisation for Cooperation and Development
PPGI	Public Procurement for Green Innovation
PPM	Process and Production Method
PPP	Public Private Partnership
RTA	Regional Trade Agreement
SCM	Subsidies and Countervailing Measures
TFEU	Treaty Founding the European Union
VCLT	Vienna Convention on the Law of Treaties
WTO	World Trade Organisation

Executive Summary

Public procurement for green innovation refers to tailoring public procurement policies in such a way as to promote green innovation within the wider economy. This study considers the nature of these policies, their legal limits, best practices, and how they have been implemented across a sample of four different OECD countries.

The study begins with a general consideration of public procurement for green innovation and its component parts (i.e. green public procurement and innovative public procurement). This includes the theory behind such measure, their limitations, and a comparison with other ways in which a government may promote green innovation.

Also included in this study is an analysis of the legal framework of public procurement for green innovation, involving such agreements as the General Procurement Agreement (GPA), the Agreement on Subsidies and Countervailing Measures (SCM), the General Agreement on Trade in Services (GATS), and various regional trading agreements (RTAs). This analysis suggests that the legal questions surrounding any given policy will turn upon its unique legal framework (i.e. the agreements to which the country in question is a signatory). Where a policy falls under the GPA there is flexibility to pursue green innovation, while the SCM appears more restrictive. RTAs incorporating public procurement provisions are quite heterogeneous, depending generally on whether the parties to the RTA are also Parties to the WTO GPA.

Finally, an analysis of four sample countries indicates that, at present, public procurement for green innovation is not being widely or systematically pursued. A range of unique, individual policies does exist, and demonstrates that each country has been able to tailor its approach to their perceived needs.

Overview

The government of every state is an actor in the market, often a relatively large actor. Government activities in the marketplace, the purchasing of goods and services or sometimes the marketing of the same, thereby impact and in some cases shape the market itself. This report examines the possibility of using government purchases to promote ‘green innovation’ – that is, innovative technologies, products, or services that offer a reduced environmental impact – in an economy.

The report is set out as follows: conceptual foundations relating to public procurement for green innovation are treated in Section II, including an analysis of potential limitations on the effectiveness of green public procurement and an assessment of other policy instruments that could be used for the same purpose. This is followed in Section III with an analysis of the legal frameworks regulating the use of public procurement for objectives such as promoting green innovations. Section IV presents four OECD country case studies where governments have used public procurement to promote green innovation (the United Kingdom, Germany, the United States and Japan). The report concludes with a summary overview of the research.

I. Preliminary Definitions and Concepts

This section analyses the nature of government interventions in the market as a purchaser, and how governments have sought to use their purchasing decisions to further the development and diffusion of green products, innovative products and green innovation. The theory and limitations of public procurement for green innovation are then considered, followed by an analysis of alternative policy options.

1. Definition of public procurement

Government or public procurement refers generically to the formal process through which official government agencies obtain goods and services, including construction services or public works.² Within the GATT/WTO system, public procurement refers to the process by which a government obtains the use of or acquires goods or services for governmental purposes and not with a view to commercial sale or resale, or use in the production or supply of goods or services for commercial sale or resale.

When a government buys goods and services there are typically several competing objectives or 'desiderata' operating within the procurement system.³ Policy objectives range from aims as diverse as wanting to promote competition, customer satisfaction and integrity to distributing wealth, avoiding risk and spurring innovation. A trade off is often inevitable because there may be little compatibility among the various objectives that public procurement policy can potentially serve. Demanding the best price for the best quality available may mean choosing a large foreign supplier over a small local firm. Further, the expertise required to identify the best overall value, as opposed to the best purchase price alone, will detract from short-term efficiency because it will require additional time and resources, from training in market research to contract negotiation.

Different policy objectives emerge depending on the type of procurement a government undertakes. Public procurement can for this analytical purpose be subdivided into three different varieties: direct, co-operative, and catalytic.⁴ Direct procurement refers to situations where a government agency or representative makes purchases for use by that body, and where the need for the product is largely confined to the public. Much of the procurement carried out by national defense agencies, such as the procurement of military vehicles and hardware, would fall into the category of direct procurement. Co-operative procurement corresponds to situations where the public entity makes purchases of innovations also sought after by segments of the private sector.⁵ An example of such purchases would be government vehicles using alternative fuels or drive systems, where it is foreseeable that there could also be a private market for these goods. In such a situation, it is possible that public procurement of a product that may be innovative, environmentally friendly, or both, could also spur demand and adoption in the private market, leading to a greater diffusion of this technology. Finally, catalytic procurement refers to situations where the ultimate users of the technology will be private industry or consumers, and the state merely promotes the development of this

² World Trade Organization, *Dispute Settlement*, 3.12 Government Procurement, p. 3 (2003). OECD, *Journal on Budgeting*, Volume 2, No. 3, p. 151 (2002).

³ S. Schooner, 'Desiderata: Objectives for a System of Government Contract Law' 11 *Public Procurement Law Review* (2002).

⁴ *Id.*

⁵ *Id.*

innovation financially, such as might be the case for innovative kitchen appliances.⁶ Here, the government may have identified an un-serviced niche in the market and sought to bring about the development of superior technologies to pursue certain policies, like greater home energy efficiency.

Given the size of procurement markets,⁷ public procurement policies and objectives can play a powerful role in channelling the energies and attention of the market.⁸ This is the intellectual basis behind structuring a public procurement system to promote certain ends or values.

2. Definition of public procurement for green innovation

Public procurement for green innovation may be defined as public procurement which results in ‘the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organization (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives’.⁹ Note that this definition is not intended to include, for example, an organization improving the environmental impact of its facilities by adopting a new process already widely known in the market but, as used in this study, would include the adoption of an existing environmentally friendly process that has not yet achieved a sustainable market presence, thereby contributing to the diffusion of this innovation. Public procurement for green innovation may represent an opportunity to reduce the environmental impact of government purchases and promote a greener economy by placing an emphasis in the procurement process on those products that offer innovative solutions to environmental products but have not yet gained wide market diffusion, and potentially represents an important policy tool.

Public procurement for green innovation represents a synthesis of two related concepts. These two procurement regimes – green public procurement and the public procurement of innovation – have a wider base in the literature on public procurement, and appear below.

3. Definition of green public procurement

Green public procurement is defined by the European Commission as ‘... a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured’.¹⁰ It is not

⁶ *Id.*

⁷ China's public procurement market totalled approximately \$88 billion in 2008, more than triple the amount in 2003. The EU's procurement market was worth over €1 500 billion, over 16 per cent of total EU GDP in 2004, and grew to over €2 150 billion in 2008. Sources: V. Tanzi and L. Schuknecht, *Public spending in the 20th century A Global perspective*, Cambridge University Press (2000). EC DG Internal Market Public Procurement Indicators 2008.

⁸ See for example C. McCrudden, *Using public procurement to achieve social outcomes*, *Natural Resources Forum* 28, pp. 257–267 (2004).

⁹ Kemp et. al., *Final report MEI project about measuring eco-innovation*, (2007). Note: this definition was specifically applied to the term ‘eco-innovation’, however we feel the definition to be appropriate in these circumstances.

¹⁰ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, *Public procurement for a better environment*, European Commission, Brussels, p. 5 (2008).

possible to define 'green' specifically in this context, as these specifications will be unique to any tender offered by a government body.

McCrudden notes that the rapid development of green procurement can be seen as one part of a raft of initiatives to promote the general goal of sustainable development. In 2009, President Obama signed an Executive Order directing all federal agencies to 'increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities.'¹¹ The Executive Order also stipulates that federal agencies must immediately start conducting 95 percent of their purchases through green certified programmes, and achieve a 28 percent greenhouse gas reduction by 2020.¹² In the US, federal, state and local government constitute more than 38 percent of GDP, with the federal government alone spending \$3.6 trillion in 2010. Clearly a redirection of government purchasing could create large markets for clean power, electric vehicles and efficient buildings, as well as for more sustainably produced furniture, paper, cleaning supplies, uniforms, food and services. If the US government buys green goods and services, it would likely serve to drive down marketplace prices adding momentum to the private sector.

Green public procurement does not require elevating ecological concerns above all others, and may instead involve a focus on life-cycle costs rather than merely purchase cost (ex. encouraging government agencies to include in the total cost of a vehicle the cost of fuel over its lifetime, rather than merely its purchase cost, and to use this data when selecting among competitive tenders. This can be seen in the city of Freiburg example below).¹³

It is important to note that the difference between the 'public procurement for green innovation' and 'green procurement' lies in the definition of 'innovation' above. Public procurement for green innovation involves the purchase of green products or technologies that do not yet have a significant market – those products with unrealized economic potential. More than simply taking environmental impacts into consideration in the procurement process, public procurement for green innovation is about giving preference to those products that offer innovative solutions to environmental problems, or innovative methods of lessening the environmental impact of the activity for which the government is making its purchase. It is both about changing today's technology to make it more environmentally friendly, and also about propelling broader innovation leading to benefits, which will materialize in the future.

More recently, this area of green procurement has grown to encompass aspects of social procurement that can be combined with green procurement to produce 'sustainable procurement'.¹⁴ While a broader discussion of these tools is outside the scope of this paper, these may include accounting methods which better account for environmental impact of a purchase, more comprehensive and accessible information about the environmental impacts of purchases (for procurement officers or the public), and training programmes for agency members about how and where to incorporate environmental considerations into procurement decisions.

¹¹ United States Executive Order 13514.

¹² C. Parenti, *The Big Green Buy: How Government's Purchasing Power Can Drive the Clean-Energy Revolution*, The Nation, Aug. 2, 2010.

¹³ Fraunhofer, *Innovation and Public Procurement*, p. XI (2005).

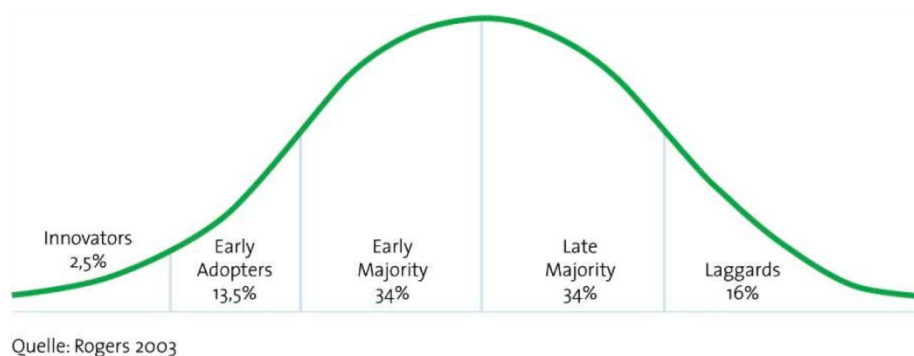
¹⁴ See, for example, OECD, *The environmental performance of public procurement: Issues of policy coherence*, (2003).

4. Definition of public procurement of innovation

For the purposes of this paper, innovation is defined as ‘the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations’.¹⁵ Public procurement of innovation is therefore commonly referred to as the procurement of pre-commercial goods and services, i.e. those that have not yet significantly appeared on the market.¹⁶ It may be either general or specific: there may be a general policy of the government giving preference to tenders or suppliers able to demonstrate innovation in their product (ex. reducing the weighted ‘cost’ of a product in a competitive tender by a specified amount to reflect innovative technology) or, alternatively, a specific effort to bring about the development of a product or market (ex. smart technologies which reduce power consumption during peak hours).¹⁷ In this paper, where discussing products that were not developed exclusively for the purposes of a government tender, we will construe this definition broadly to incorporate all products that have not yet achieved commercial viability. Therefore, although the government may not be the first user of an innovative technology, and this technology may not have been developed explicitly for government use, this paper includes government purchases of products that do not yet have a viable commercial base fit within this definition.

Graph 1, below, illustrates the general adoption patterns for many innovative products. After discovery by a small minority of consumers (or producers) an innovative product, process or service will, if successful, begin a process of wider diffusion. By putting the governments substantial financial pull behind technologies at the innovation or early adoption stages, the government may be able to push an innovative product further along the path of adoption within the private market.

Graph 1: Adopters across product lifecycle.¹⁸



Innovation is commonly considered an essential component of economic growth and development.¹⁹ By decreasing the necessary inputs or costs of a given quantity of

¹⁵ OECD/Eurostat, *Oslo Manual*, p. 46 (2005).

¹⁶ See National IST Research Directors Forum Working Group on Public Procurement, *Pre-Commercial Procurement of Innovation*, p. 17 (2006).

¹⁷ Fraunhofer, p. 15.

¹⁸ Rogers, E. M., *Diffusion of Innovations*, New York: Free Press, p. 5 (2003).

¹⁹ Rosenberg, *Innovation And Economic Growth*, OECD (2004).

production, allowing the development of new and superior products, and creating whole markets which did not exist previously, innovation is the foundation of long-term economic growth.²⁰ It is common, therefore, for governments to develop policies that they believe will favour innovation. Section III of this report outlines measures that have been taken in four different OECD countries to adapt public procurement for the achievement of specific policy goals, including innovation and environmental protection .

5. Theory behind public procurement for green innovation

As with all of the above government policies, public procurement for green innovation represents the intervention of government into the economy, and the literature on the desirability of such intervention is vast. Among the most influential is the market-failure model, which suggests that government has a legitimate and economically beneficial role to play in correcting market failures that prevent the free-market from operating efficiently.²¹ We must therefore ask what these potential market failures are and how public procurement for green innovation may correct them.

First, green innovation can in many respects be a gamble: Innovation involves substantial risk that an investment in research or development will not return a profit, or even recoup its costs. Here, the government may have an important role to play by offering green innovators a guaranteed market for their product. The result is a form of risk-sharing, where the supplier of a product may agree to shoulder all research and development costs while the public procurer agrees to purchase and test products that may not be accompanied by the same guarantees as traditional products.²² This allows innovative producers to rest assured of a guaranteed and accommodating market for their product.

Second, adding to this first rationale, by purchasing these products the government may propel further sales in the private market either through diffusion of knowledge about the product, or by acting as the standard setter within a given economy. There is evidence that governments are often among an economy's more demanding consumers, suggesting that government demand may both indicate the direction in which a market is heading and what standards will become the norm.²³ The broader adoption of green innovations in the private market offers producers a greater return on the original research investment, compounding the positive effects of government intervention.²⁴

Finally, it is important to note that public procurement for green innovation may be more than pure altruism on the part of the government. Promoting innovation means gaining access to innovative technologies and methods for addressing the problems which daily confront a modern government.²⁵ These innovations may entail cost savings, or simply superior ways of delivering government services. Greener public purchasing may involve nothing more than looking at potential tenders in terms of life-cycle costs rather than purchase costs, offering cost savings in the longer term. Further, these efforts may assist governments in meeting their international commitments, such as emissions

²⁰ *Id.*

²¹ Barry Bozeman, *Public-Value Failure: When Efficient Markets May Not Do*, *Public Administration Review*, Vol. 62, No. 2, p. 146 (2002).

²² Norden, *Innovative Green Public Procurement of Construction, IT and Transport Services in Nordic countries*, p. 24 (2010).

²³ Robert Dalpé et al., *The public sector as first user of innovations*, *Research Policy*, (1992).

²⁴ Georghios et. al, *Public procurement and innovation—Resurrecting the demand side*, p. 956 (2007).

²⁵ Georghios, p. 954.

reduction targets under the Kyoto Accord. Such policies also create domestic demand, encouraging innovating firms to re-locate and take advantage of these favourable conditions.²⁶

In general, it is necessary for any modern government, in order to fulfil its mandate, to make large interventions into the market. It is therefore reasonable to suggest that, in doing so, a government should be mindful of their impact upon the market, and give thought to how their purchases may be used strategically for the accomplishment of other goals.

²⁶ Georghoius, p. 954.

II. Potential issues with public procurement for green innovation

Public procurement for green innovation is, of course, no panacea. There are a number of considerations which suggest that such policies may be limited in their effectiveness, or have unanticipated consequences.

Opposite the benefits outlined above, economists often argue that government should not intervene in the functioning of a market because a centralized body cannot pick winners as effectively as the market.²⁷ In this way, public procurement of innovation may result in simply pouring money down the drain or, at worst, disrupt the proper functioning of the market.²⁸ Subjectivity in selection, where present, also introduces the potential for opacity or corruption.²⁹ While the government has a legitimate role in correcting market failures, these failures are often difficult to identify and some claim that the government should therefore be conservative in its actions and avoid interventions likely to distort the market.³⁰ Further, market failures may even be the result of government intervention in other aspects of the market, highlighting the risks and uncertainty involved in any intervention or any classification of some phenomena as a market-failure.

Where public procurement for green innovation is adopted as an environmental policy, other problems are also present. First, such policies are inherently bounded in their effectiveness by the fact that they are limited both to purchases by the government, as well as purchases where such considerations of 'green-ness' are feasible.³¹ While the government may have a large role in some areas, in others it may represent only a small portion of the market. They may therefore have only a limited impact on the wider private market, and where they do they may actually crowd-out private green purchases by raising the price of green products, making unsustainable products relatively more desirable.³² While this argument carries less weight where the products are truly innovative, and no non-green alternative exists, it is a worthwhile consideration. Any green public procurement policy may also be limited by the fact that the focus on sustainability comes at the purchase stage, which may be more limited in its impact than situations where the government merely sets environmental regulations and the market responds accordingly.³³

Where a government does choose to pursue these policies, a number of recommendations may help ensure that the system functions as effectively as possible. First, in cases of specific procurement, the government agency in question must have a firm idea of precisely the type of innovation it is seeking to have developed, as well as an informed opinion about the current and future condition of the relevant market. While this may appear self-evident, when dealing with proposed green technologies and relying on speculations about the trajectory of certain markets it can be difficult for government representatives to know precisely where resources should be allocated. Morris provides the example of the UK semiconductor industry between 1970 and 1990, where the

²⁷ Hindley, *Empty Economics in the Case for Industrial Policy*, The World Economy, p. 282.

²⁸ *Id.*

²⁹ OECD, *Integrity in Public Procurement*, p. 21.

³⁰ Fraunhofer, p. 6.

³¹ Marron, p. 88.

³² OECD, *Improving the Environmental Performance of Public Procurement: Issues of Policy Coherence*, p. 7.

³³ Marron, p. 89.

British Ministry of Defense failed to recognize the growing importance of semi-conductors in the field and underinvested in this crucial technology.³⁴ Not only must the public sector understand its needs, it must the direction that the market is taking. The 'Forward Commitment Procurement' program by the UK governments attempts to address this necessity.³⁵

Second, there must be a widespread understanding across the public sector of the importance of any green public procurement initiatives. Initiatives should occur within a broader context of education within the government about its importance, and the philosophy behind the policy.³⁶ Given the large and varied nature of government purchases in the market, inter-departmental cooperation is necessary if the push for green innovation is going to have a substantial impact.³⁷ A lack of cooperation between government departments might be an issue with regard to public procurement of innovation in the US, as initiatives seem to be taken individually by each respective department without central coordination.³⁸ The involvement of high-level decision makers is also critical both to ensure compliance and to demonstrate to the market that the will exists to see green innovation through from infancy to marketability.³⁹

Third, if the government wishes their efforts to have the widest impact possible, efforts must be made to ascertain the needs of the private market and to link the efforts to foster innovation to probable market demand, requiring ongoing communication with and analysis of the marketplace.⁴⁰ Communication is also important because, unlike in most anonymous market transactions, the buyer has crucial information about the product that needs to be shared with the producer.⁴¹ Unless the public sector is able to articulate their needs regularly with industry, it is unlikely that the process will proceed as desired. Again, the 'Forward Commitment Procurement' program from the UK could serve as 'good practice' here.

Overall, it is worthwhile to recall that any intervention in the economy must rest on the assumption that the economy is not independently optimizing, and a careful analysis must be done to determine both that the government is well positioned to improve the allocation of resources, and to determine which are the best tools with which to pursue these changes. The following section is intended to present some of the alternative or complementary measures other than public procurement for green innovation which have been debated or adopted by policy makers intent upon spurring green innovation.

³⁴ Morris, *A History of the World Semiconductor Industry*, (1990), cited in Fraunhofer, p. 11.

³⁵ see section III.2.iii.) for further information.

³⁶ Bouwer et. al., *Green Public Procurement in Europe 2005 - Status overview*, p. 52 (2011).

³⁷ Georghios, p. 957.

³⁸ see section III.3.iii.) for further information.

³⁹ Georghios, p. 960.

⁴⁰ Georghios, p. 958.

⁴¹ Fraunhofer, p. 9.

Overview of alternative measures

Table 1⁴²

	Public Procurement	Regulation	Research Institutions and Universities	Public R&D Subsidies
Selection By	State	None	Firm	State
Primary Government Objective	Satisfaction of public demand and pursuit of political goals by stimulating demand	Influence the behavior of private actors	Generation and provision of scientific and technological knowledge	Stimulation of R&D activities of firms
Input for Firms	Money	None	Knowledge	Money
Primary Participation incentive for firms	Sales	Mandatory	Access to knowledge	Cost/risk sharing
Effect on firm success	Market risk reduction	Market risk reduction	Technological opportunity	Cost reduction
Time horizon	Direct, short term	Direct, short-term	Continuously, long-term	Medium-term
Inherent Risk	Dependence on public demand	Un-targeted	Knowledge may not spread widely	Crowding out of private R&D investments

⁴² Birgit Aschoff & Wolfgang Sofka, *Innovation on demand—Can public procurement drive market success of innovations?*, Research Policy 38, p. 1238 (2009).

i. Regulation

In the case of regulation (either ‘economic (e.g. antitrust policy, price control), social (e.g. environmental or safety regulation) or administrative (e.g. product liability) regulations’), government may also structure the law to facilitate innovation.⁴³ Regulation that facilitates competition in the market, for example, may compel firms to innovate; adjustments in the design of the intellectual property system may promote the same.⁴⁴ Further, it is well known that regulation can work to strangle innovation in an economy,⁴⁵ and ensuring that regulation helps rather than hinders innovation is almost certain to play a role in any successful green innovation strategy. However, because regulation represents a considerable intervention in the normal functioning of the market, like public procurement for green innovation it also raises questions about the government’s ability to determine what products or standards are best suited for the market.

Regulation has the benefit of encouraging the market to innovate based upon government-established standards.⁴⁶ Rather than relying upon the government to determine which innovations are best to support, the government decides the desired outcome (ex. vehicle emissions regulations) and allows the market to determine how to meet these criteria. In this way, regulations inform producers and innovators about what target to set for their products and reduce the supply of polluting products directly. Overall, studies have shown that regulation can have a substantially positive impact on innovation where carefully adopted.⁴⁷

US federal law includes the Clean Air Act to control [air pollution](#) on a national level. It requires the [Environmental Protection Agency](#) (EPA) to develop and enforce regulations to protect the general public from exposure to [airborne contaminants](#) that are known to be hazardous to human health. Title II covers the emission standards for moving sources. In 2007 the Supreme Court ruled that the EPA Administrator must show whether or not ‘emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare ... Because of car pollution, 30,000 people in the United States die each year.’⁴⁸ The EPA determined that the combined emissions of these greenhouse gases from new motor vehicles contribute to the greenhouse gas pollution that threatens public health and welfare. Consequently, Section 202(a) of the Clean Air Act was published to address these concerns.⁴⁹

⁴³ Aschoff, p. 3.

⁴⁴ Department for Business Enterprise and Regulatory Reform, *Regulation and innovation: evidence and policy implications*, pp. 17-18.

⁴⁵ Magat, ‘The Effects of Environmental Regulation on Innovation’, *Law and Contemporary Problems*, 1979.

⁴⁶ Marron, p. 89

⁴⁷ Aschoff, p. 4

⁴⁸ R. Barnes & J. Eilperin, *High Court Faults EPA Inaction on Emissions*, *The Washington Post*, Mar. 4, 2007.

⁴⁹ Available at <http://www.epa.gov/climatechange/endangerment.html>

Domestic Regulations and the GATT

Legal constraints on a governments' regulatory discretion to promote environmental requirements include the GATT Art. III and the Technical Barriers to Trade Agreement. This treaty takes into account the existence of legitimate divergences of taste, income, geographical and other factors between countries. The Preamble to the TBT Agreement states that:

'no country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal, and plant life or health, of the environment, or for the prevention of deceptive practices, at the levels it considers appropriate'.

However, members' regulatory flexibility is limited by the requirement for transparency and non-discrimination as well as technical requirements that regulations not be 'prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to trade' (Art. 2.2).

If a government adopts standards that are more trade-restrictive than necessary to fulfil a legitimate objective, it is open to challenge from another Member. According to the TBT Agreement, specifying (whenever appropriate) product regulations in terms of performance rather than design or descriptive characteristics helps to avoid unnecessary obstacles to international trade (Art. 2.8). Unnecessary obstacles to trade can result when (i) a regulation is more restrictive than necessary to achieve a given policy objective, or (ii) when it does not fulfil a legitimate objective.

An environmental regulation would be viewed as more restrictive than necessary if the objective pursued can be achieved through alternative measures that have less trade-restricting effects, taking account of the risks a non-fulfilment of the objective would create. Elements that Members can use for risk assessment are: available technical and scientific information, technology or end-uses of the products. Further, Art. 2.2 of the Agreement specifies that legitimate objectives include inter alia: national security requirements, the protection of human health or safety, the protection of animal and plant life or environment wellbeing.

ii. Taxes

Another policy measure, taxes, offers an opportunity to correct market failures arising from situations where environmental polluters do not pay for the full negative impact of their pollution on the environment (i.e. externalities). A carbon tax sets a price for carbon dioxide emissions to reflect more accurately the societal cost of the goods' production and use, thereby internalizing (i.e. assigning to the producer or user) the costs associated with production. For example, many OECD countries have taxed fuel directly for many years for some applications. A carbon tax may be used to place renewable energy sources on a more competitive footing, stimulating their growth, and can also foster innovation by compelling pollution intensive industries to innovate to reduce their tax burden. It is worthwhile to note, however, that this impact may be diluted in industries like the energy sector where demand is highly inelastic; consumers are unlikely to significantly alter their behavior, even in the face of price increases, where a product is deemed to be an irreplaceable part of their lifestyle.

Taxes and the GATT/WTO

Domestic taxes and internal regulations are regulated by the GATT/WTO provisions requiring national treatment and non-discrimination under GATT Article III. The Art. III implements a non-discrimination doctrine obligating WTO members to treat competing domestic and foreign products equally with respect to internal (nontariff) taxation.

The WTO's existing jurisprudence offers no *per se* rules on whether internal taxes that are facially neutral, but potentially discriminatory in effect, violate Art. III:2 of the GATT. Nevertheless, a dispute settlement panel that finds a green tax discriminatory in its effect may grant the measure an exemption under Art. XX(g)⁵⁰ due to its expected effectiveness in combating recognized environmental risks, including poor air quality and global warming from transport emissions.⁵¹ Of relevance here is the Kyoto protocol, which sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. These amount to an average of five percent against 1990 levels over the five-year period 2008-2012.

iii. Subsidies and Research & Development

Alternatively, governments often provide funding to universities and public research institutions, with the intention of promoting innovation or research in the area of green technology that will then be available to the entire market.⁵² Research and development funding has the benefit of promoting innovation in a way that is less distortionary of the market than other methods, while also encouraging the domestic growth of innovative industries to take advantage of these innovations. Studies have shown that this variety of government intervention can be very effective, depending on the industry.⁵³

The government may also provide subsidies or tax credits directly to participants in the private market, usually to fund specific projects.⁵⁴ This practice has been shown to have positive effects when directed towards the promotion of innovation.⁵⁵ The challenge is that even when subsidies are known to be temporary, it may be politically difficult to cease providing this funding. While governments may be able to guarantee the availability of subsidies for 3 or 4 years, it is often the case that this time frame may be less than that necessary to effectively take green innovations to market. Finally, an OECD report notes that subsidies are commonly subject to criticism from economists, and sometimes manufacturers, both for their effectiveness and their impact on the market.⁵⁶

⁵⁰ Article XX(g), permitting measures relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.

⁵¹ An Article XX exemption is subject to 'the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade' (Art. XX GATT).

⁵² Aschoff, p. 5.

⁵³ Aschoff, p. 5.

⁵⁴ Aschoff, pp. 5-6.

⁵⁵ Aschoff, p. 6.

⁵⁶ OECD/ITF, *Stimulating Low-Carbon Vehicle Technologies*, (2010).

Subsidies and the GATT/WTO

A government cannot promote domestic green innovation regardless of the adverse effects it might have on other Members production interests. The WTO Agreement on Subsidies and Countervailing Measures (SCM) recognizes that when a government procures a good, a subsidy⁵⁷ can occur if some benefit is conferred to the producer. Even if a type of procurement has been excluded from the schedules of the GPA, (see Section III) it will still be covered by the provisions of the SCM; just as a government that is not a Party to the GPA is still subject to the obligations of the SCM.

Two types of subsidies are prohibited under the SCM: subsidies that are contingent on export performance and those that are contingent on the use of domestic over imported goods. Domestic content requirements have been challenged in the WTO disputes *Certain Measures Affecting the Renewable Energy Generation Sector* (see Insert 1) and *Measures concerning wind power equipment* case.⁵⁸ In the latter case, the US had alleged China to have granted grants, funds and awards to wind manufacturing firms that were contingent on the use of domestic components from China.⁵⁹ This case has been recently settled between the parties. In the recent WTO aircraft cases, DSB Panels assessed the compliance of R&D subsidies to the companies Airbus and Boeing that were aimed at stimulating innovation, on their compliance with the SCM agreement.⁶⁰

On the premise that a subsidy that distorts the allocation of resources within an economy should be subject to discipline, certain ‘specific’⁶¹ subsidies are also ‘actionable’ under the SCM. Specific actionable subsidies include green innovation procurements targeting national champions or domestic SMEs, and green innovation procurements targeting a particular sector, electric vehicles for example. The adverse effects of a subsidy is recognized in terms of:

- i.) Injury to a domestic industry caused by subsidized imports in the territory of the complaining Member (e.g., dumping)
- ii.) Serious prejudice: this usually arises as a result of adverse effects (e.g., export displacement) in the market of the subsidizing Member or in a third country market.
- iii.) Nullification or impairment of benefits accruing under the GATT 1994 if the improved market access presumed to flow from a bound tariff reduction is undercut by subsidization.

A finding of serious prejudice involves an assessment of whether the procured product and a product from another WTO member state are seen as ‘alike’. In the *EC-Asbestos* Appellate Body Report, four criteria were set out as a framework for assessing the likeness of products. These were i) the properties, nature and quality of the product, ii) the end-uses of the product, and iii) consumers’ tastes and habits, and iv) customs classification.⁶² The Appellate Body findings broadly suggest that if the products compete with each other to a sufficient extent, they will be

⁵⁷ The WTO SCM Agreements defines a subsidy to be (i) a financial contribution (ii) by a government or any public body within the territory of a Member (iii) which confers a benefit. All three of these elements must be satisfied in order for a subsidy to exist.

⁵⁸ Available at http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds419_e.htm.

⁵⁹ *Id.*

⁶⁰ Relevant decisions are the Panel Report on ‘Measures Affecting Trade in Large Civil Aircraft’ (DS.316) and the Panel Report on ‘Measures Affecting Trade in Large Civil Aircraft — Second Complaint’ (DS.353).

⁶¹ Where a subsidy is ‘non-specific’ or widely available within an economy, a distortion in the allocation of resources is presumed not to occur.

⁶² WTO Appellate Body, Report of the Appellate Body: EC — Asbestos, WTO Doc WT/DS135/AB/R (12 March 2001) [109].

found to be 'like'. Under such an assessment, process methods such as those with higher environmental standards are unlikely to be viewed by the DSB as a distinguishing feature.

Unlike the GATT, there is no equivalent environmental exception to Art. XX GATT set out in the SCM. The provisional Art. 8 rendered certain R&D, regional development, and environmental adaptation subsidies immune from WTO remedies and from the imposition of countervailing duties, because they were seen to be only minimally trade distorting. Under Art. 8 SCM public assistance would be permitted if it were for industrial research or pre-competitive development activities to support the innovative process before actually buying the goods, see the discussion on the Trondheim dispute below. Most notably, this provision exempted measures to 'promote adaptation of existing facilities to new environmental requirements imposed by law and/or regulations which result in greater constraints and financial burden on firms' from the actionable subsidy category.

Art. 8 was not renewed due to lack of consensus among the WTO Members over these provisional articles. Furthermore, there is no doctrinal agreement as to whether subsidies to promote environmental innovation that are prohibited under the SCM agreement could potentially be defended under the GATT Art. XX environmental exceptions.⁶³ The Appellate Body has ruled that the relationship between the GATT and other Annex 1A agreements (including the SCM) shall be considered on a case-by-case basis.⁶⁴ This prevents firm conclusions on the permissibility of subsidies aiming to promote environmental innovation, whether or not the subsidy takes place through a procurement contract.

⁶³ See e.g. Bradley J. Condon, *Climate Change and Unresolved Issues in WTO Law*, 12 *Journal of International Economic Law* 895, (2009).

⁶⁴ Appellate Body Report, Brazil - Desiccated Coconut, WT/DS22/AB/R, adopted 20 March 1997, para. 13.

*Insert 1: Canada — Certain Measures Affecting the Renewable Energy Generation Sector*⁶⁵

The current consultation between Japan and Canada with regard to a feed-in tariff scheme that the state of Ontario has implemented could give guidance to whether local content requirements that are integrated in a public procurement process would violate WTO law.

A feed-in tariff is generally implemented by the government of a country. It guarantees grid access to renewable energy producers, long term purchasing contracts with electricity utilities and fixed purchase prices that are independent from the existing market price. The innovation risk is essentially born by the government or the end consumers, who reimburse the electricity utilities for the price premium that the utilities then pay to renewable energy generators. The state of Ontario attached domestic content requirements for wind and solar energy generation projects over 10MW to its feed-in tariff.⁶⁶ Thus, renewable energy investors must present a domestic content plan that shows that they will comply with the domestic content requirements.⁶⁷

Japan has challenged Ontario's feed-in tariff as a prohibited subsidy within the scope of Art. 3.1(b) SCM (as well as a violation of Art. III:4, III.5 and III.1 GATT and Art. 2.1 TRIMs Agreement). If the scheme is found to amount to a subsidy within the scope of Art. 1 SCM, it would probably be found to be a 'subsidy contingent upon the use of domestic over imported goods' under Art. 3.1(b) SCM as well and would therefore need to be withdrawn 'without delay'.⁶⁸ As mentioned, the SCM agreement does not contain an exception provision for environmentally-friendly measures that Canada could invoke. Following the discussion above, it is unlikely that Canada could successfully invoke Art. XX(b) or (g) GATT 1994 as defences of the feed-in tariff.

A possible defence for Canada would be to treat Ontario's feed-in tariff as public procurement under the GPA agreement instead of under the SCM agreement. The Green Energy and Green Economy Act of 2009, implementing the feed-in tariff, explicitly refers to the scheme as a 'program for procurement'.⁶⁹ In order for the GPA to be applicable, first, the implementing agency must be listed in Appendix I of the GPA. The Ontario Power Authority, an entity that is under the direction of the Ontario Ministry of Energy and tasked with implementing the feed-in tariff⁷⁰, is not itself listed in Appendix I.⁷¹ As the Ontario Ministry of Energy is listed, the GPA could only apply to the feed-in tariff, in case the Ministry was found to be strongly involved into the administration of the tariff and if the Ontario Power Authority fell into the definition of 'enterprise', subject to Article I.3 GPA. Assuming the GPA's applicability, Article XVI GPA would likely be violated, as the local content requirements that are attached to the feed-in tariff would constitute 'offsets'.

⁶⁵ Case available at http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds412_e.htm

⁶⁶ For wind, 25 per cent of the content needs to be local until 2011. From 2012 on, the share increases to 50 per cent. For solar energy, 50 per cent of the content needs to be local until 2011. From 2012 on, the share increases to 60 per cent. *Available at*

<http://fit.powerauthority.on.ca/Page.asp?PageID=122&ContentID=10605>.

⁶⁷ *Id.*

⁶⁸ Art. 4.7 SCM.

⁶⁹ The *Green Energy and Green Economy Act* (2009), Schedule B II 7(4), *available at* http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2145&detailPage=bills_detail_the_b

⁷⁰ In accordance with the *Green Energy and Green Economy Act* (2009) which was passed into law by the Legislative Assembly of Ontario on May 14, 2009, *available at*

http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2145.

⁷¹ The Ontario Power Authority would have to be listed in Annex 2 of the Appendix, as it is a sub-central government entity. *Available at* http://www.wto.org/english/tratop_e/gproc_e/can2e.doc.

III. Legal limitations on using public procurement for green innovation

Several legal frameworks condition how governments can use public procurement to stimulate green innovation. As this section indicates, while the plurilateral WTO GPA provisions apply to those 40 governments that are signatory parties, the WTO GATS agreement also contains more generally applicable provisions relating to the procurement of certain services. In addition to WTO agreements, governments are also increasingly choosing to incorporate public procurement provisions or chapters in their regional and bilateral trading arrangements. These procurement regimes all provide some discretion for governments to determine their own social and environmental standards and specifications. Nevertheless, this overview indicates both that there are limits to this discretion, and also that these limits vary between the different agreements.

1. WTO Public Procurement Agreement

Public procurement was explicitly excluded from the national treatment obligation in the General Agreement on Tariffs and Trade (GATT).⁷² Consequently, certain interested GATT Parties negotiated a Public Procurement Code that was to be applicable only as between the signatory parties. The Public Procurement Agreement (GPA)⁷³ became the successor to the Procurement Code during the Uruguay Round negotiations establishing the WTO. While remaining plurilateral and voluntary⁷⁴ in membership, the GPA extended its coverage to services and construction works, entities at sub-central and local government levels, and certain public and regulated private companies.⁷⁵ The GPA also established new financial thresholds for contracts covered by the agreement, along with stronger provisions regulating procedural and technical requirements imposed by entities on services and goods providers.⁷⁶

The extent to which the commitments of the GPA govern procurement promoting green innovation must be determined on a case-by-case basis due to the different schedules each contracting Party has negotiated. It can nonetheless be argued that there is sufficient flexibility under the GPA to promote green innovation through public procurement without violating the terms of the agreement. This can be undertaken either *ex ante* through excluding strategic entities or markets from the coverage of the agreement in negotiations, or *ex post* by justifying the measure under the Art. XXIII exceptions relating to security, the environment or human health.

Smaller green innovation contracts will fall below the threshold levels that determine coverage with regard to value. This is of importance to smaller contractors although, as noted above, the US also negotiated a carve out to promote domestic small and medium sized enterprises by exempting them from the obligations of the GPA.

⁷² Article III:8(a) states that ‘the provisions regarding national treatment for imported products shall not apply to laws, regulations or requirements governing the procurement by government agencies of products purchased for government purposes.’

⁷³ The GPA came into force on 1 January 1996.

⁷⁴ The GPA remains voluntary to the original GATT signatory Parties, however new WTO Members may be required to join the GPA in their Accession Protocol.

⁷⁵ Subject to negotiated limitations.

⁷⁶ Available at http://www.wto.org/english/tratop_e/gproc_e/thresh_e.htm.

Where applicable, the GPA lays down rules guaranteeing fair and non-discriminatory conditions for internationally competitive tendering and emphasizes the need for transparency at each step of the procurement process. Art. III provides the cornerstone to the agreement by setting out non-discrimination and national treatment as the two basic principles governing the GPA. It requires that each party shall immediately and unconditionally provide treatment to the products, services and supplies of other parties that is no less favourable than that accorded to domestic products and services and those of any other party. Further, each party shall ensure that its entities will not treat a locally-established supplier less favourably than another locally-established supplier on the basis of degree of foreign affiliation or ownership and that its entities shall not discriminate against locally-established suppliers on the basis of the country of production of the good or service being supplied, provided that the country of production is a Party to the GPA.

The GPA does not cover public procurement markets comprehensively. The reach of the agreement is qualified by Art. I, which states that the Agreement applies to any law, regulation, procedure, or practice regarding any procurement by entities as specified in Annexes 1-5. Governments seeking to use procurement to stimulate green innovation through tendering processes that discriminate against foreign or small businesses can exclude relevant agencies, goods or services from the commitments of the provisions during the negotiation process. The GPA typically follows the positive list approach to determine the reach of the provisions with regards to entities, and only applies to entities that are listed in an Annex.⁷⁷ Additionally, those entities listed are only subject to the commitments of the agreement if the value of the procurement contract exceeds specified thresholds. A negative list approach is typically taken by the Parties with regards to goods. In principle all procurement of goods is covered unless it is specified to be excluded in an Annex. However, for the procurement of defence or security goods, generally only items explicitly scheduled are covered. Procurement of services is also subject to a positive list set out in Annexes 4 and 5. This gives GPA Members significant flexibility in negotiating to what extent they wish subject their domestic procurement practices to the stipulations of the commitments.

Procurement tender requirements can, in principle, also include environmental standards that relate to how a good or service is produced as well as its physical properties. This is because Art. VI:I provides that:

Technical specifications laying down the characteristics of the products or services to be procured, such as quality, performance, safety and dimensions, symbols, terminology, packaging, marking and labelling, *or the processes and methods for their production and requirements* relating to conformity assessment procedures prescribed by procuring entities, shall not be prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to international trade. (Emphasis added).

Procurement tenders that demand certain specifications related to environmental protection can serve to stimulate green innovations. Unless they are exempted from the agreement's reach, these process and production requirements may not, however, serve

⁷⁷ Annex I lists covered central government entities; Annex 2 lists sub-central government entities; and Annex 3 lists 'all other entities that procure in accordance with the provisions of this Agreement.'

to distort trade unnecessarily. As yet, there is still little case law on necessity in preferential procurement to draw upon. This is partly because most procurement disputes are between contractors and the procuring agency and take place in domestic bid challenge systems.⁷⁸ Nevertheless, as the Belgium-Family Allowances Case indicates, discussed below, it is likely that an interpretation of unnecessary obstacles to international trade, national treatment and most-favoured-nation treatment rules would prohibit tender specifications that demanded process or production requirements from some GPA states but not for domestic bidders or from some other GPA parties. The Japan-Procurement of Navigation Equipment case further illustrates that even when the same PPM-based specifications apply to all tenderers, it may still be *de facto* more difficult for some Parties or firms to comply than others.⁷⁹

A signatory Party may not seek to use procurement contracts to support domestic industries that are developing green innovations. Local content requirements may not be built into any procurement contract subject to the provisions of the GPA. This is because offsets (defined by the WTO as ‘any condition or undertaking that encourages local development or improves a Party’s [a Signatory] balance-of-payment accounts, such as the use of domestic content, the licensing of technology, investment, counter-trade, and any similar actions or requirements’)⁸⁰ are generally considered to violate the cornerstone principles of national treatment and non-discrimination. Offsets are implicitly prohibited under the national treatment and non-discrimination provisions set out in Art. III. They are also explicitly prohibited in Art. XVI., subject to the flexibilities set out for developing and least developing countries.

In the event that a covered procurement does not conform to the GPA, a Party has recourse to justify a social or environmental measure as necessary under the ‘exceptions’ to the agreement. Art. XXIII states that:

‘Nothing in this Agreement shall be construed to prevent any Party from taking any action or not disclosing any information which it considers necessary for the protection of its essential security interests’.

Art. XXIII:2 further provides that nothing prevents any Party from imposing or enforcing measures deemed necessary *inter alia* to protect public morals, order or safety, human, animal or plant life or health or intellectual property. This legal avenue is, however, subject to the requirement that such measures are not arbitrary or unjustifiable discrimination between countries or a disguised restriction on international trade.

⁷⁸ The bid challenge procedures of the GPA provide that procurement decisions shall be subject to challenge by private bidders before national courts or impartial administrative bodies. Any disputes regarding the implementation of the agreement by the signatory Parties are also subject to the provisions of the WTO Dispute Settlement Mechanism.

⁷⁹ Japan – Procurement of Satellite Navigation. WT/DS73/5. 3 March 1998

⁸⁰ WTO Report, *Revision of the Agreement on Public Procurement*, Geneva, 8 December 2006.

2. Assessing the conformity of public procurement promoting green innovation

This section offers an assessment of the WTO conformity of a hypothetical public procurement agency promoting green innovation from a) a signatory of the WTO GPA and b) a procurement that is not covered by the scope of the GPA or a non signatory of the WTO GPA but a WTO Member.

a) WTO GPA signatory party undertaking public procurement for green innovation

- i) Is the procuring entity or good/service covered in the schedules?
If no – the procurement is covered by the GATT (assessment b)
- ii) If yes – is the procurement process discriminatory?
- iii) If yes – measure violates of Article GPA Article III
Can measure be justified under Article XXIII:2 environmental exception (see below)
- iv) Are the technical specifications an ‘unnecessary obstacle to trade’?
- criteria set out in Art. VI recognises npr-ppms
- v) If yes – can measure be justified under Article XXIII:1, XXIII:2, the security and environmental exceptions respectively

GPA Article XXIII:2 qualifying criteria (not applicable to Article XXIII:1):

- procurement must not constitute an arbitrary or unjustifiable discrimination between countries where the same conditions prevail or a disguised restriction on international trade

b) WTO Member but procurement not covered by GPA

- i) Is the procurement above market value?
 - Undertake ‘like product’ analysis
EC- Asbestos like product analysis criteria:
 - i) the properties, nature and quality of the product
 - ii) the end-uses of the product
 - iii) consumers’ tastes and habits
 - iv) customs classification

While the EC-Asbestos AB interpretation does not definitively rule out distinguishing goods on environmental grounds, its suggests that until further legal developments (under Tuna Dolphin II for example), npr ppms are most likely not recognised in a like product analysis under the ASCM

If a green innovation procurement is viewed as ‘like’ a non green innovation procurement, and if the procurement is set above market value a benefit will be seen to be conferred. The procurement will therefore be prohibited as a subsidy under ASCM

- ii) Defend the non compliant measure under GATT Art XX (b), (d)?
The application of GATT Art XX is determined on case by case basis
(*Brazil – Desiccated Coconut AB Report*)

GATT Article XX the relevant exceptions:

- Art XX(b) *necessary* to protect human, animal or plant life or health

In *EC — Tariff Preferences* AB report stated that a ‘necessary’ measure is located significantly closer to the pole of ‘indispensable’ than to the opposite pole of simply ‘making a contribution to’

In *EC — Asbestos*, the AB report confirmed that a measure is “necessary” within the meaning of GATT Article XX(b) “if an alternative measure which [a Member] could reasonably be expected to employ and which is not inconsistent with other GATT provisions is [not] available to it.”

- Art XX(g) *relating to* the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;

The *Herring and Salmon* Panel Report stated that that a measure must be ‘primarily aimed at’ the conservation of exhaustible natural resources in order to fall within the scope of Article XX(g)

In *US — Shrimp*, the AB determined if the measure was “primarily aimed at” the conservation of natural resources, found that the measure was not a “simple, blanket prohibition” and that a reasonable “means and ends relationship” existed between the measure and the policy of natural resource conservation

GATT Article XXI:(a) Security Exceptions

Nothing in this Agreement shall be construed to require any contracting party to furnish any information the disclosure of which it considers contrary to its essential security interests.’

This provision could potentially be used to shelter a discriminatory procurement that promote green innovation in procuring technologies that are related to defence, eg low carbon aircraft.

As yet there is no jurisprudence or legal decision on the nature or scope of GATT Article XXI.

3. Relevant Disputes under the GATT and WTO

i. WTO Panel Report, Korea – Measures Affecting Public procurement⁸¹

The dispute highlights the prohibition of offsets or domestic content requirements for those procurement contracts covered by the provisions of the GPA. The case concerned the construction of Incheon International Airport in South Korea. The construction was originally conducted under the jurisdiction of the Ministry of Transportation, which was responsible for the New Airport Development Group. However, following the entry into force of the Seoul Airport Act, the authority to construct the airport was given to the Korean Airport Authority (KAA) and subsequently to the Incheon International Airport Corporation.

The United States brought a complaint against Korea before the WTO Dispute Settlement Body, alleging, *inter alia*, that all of the entities involved in the construction of the airport were covered by the GPA and therefore Korea violated its commitments under that agreement by imposing requirements on bid deadlines, qualification and domestic partnership.

In focusing on the issue of whether the KAA was included in the entities in Korea's GPA Appendix, the Panel found that the KAA was not legally unified with the government, its employees were not government employees and it was established by law as an independent entity. The Panel consequently concluded that the Incheon International Airport Project was not covered by the Agreement⁸² and thus not subject to the GPA's transparency, national treatment and non-discrimination requirements.

The United States also raised a non-violation complaint under GPA Art. XXII:2 alleging that while the GPA was not, as such, violated, the interests of the US were nullified and impaired. The Panel found that it could examine the US claim under Art. 48 of the Vienna Convention on the Law of Treaties (VCLT). These articles are generally applicable not only to the performance of treaties but also to treaty negotiations. However, the Panel still found that the US failed to prove that it had reasonable expectations that a benefit had accrued; Korea had made no concessions on the project at issue. Further, the panel found that the US knew of this legislation at the time of negotiation.⁸³

The findings from this dispute suggest that procuring green innovations through independent entities not explicitly listed in the schedules does not necessarily shelter such measures from the obligations of the agreement. The Panel stated that the relevant questions to be asked are: (1) whether an entity (KAA, in this case) is essentially a part of a listed central government entity (MOCT). That is, whether the entities are legally unified, and (2) Whether the entity (KAA) and its successors have been acting on behalf of a listed central government entity (MOCT). The Panel found that '[I]t would defeat the objectives of the GPA if an entity listed in a signatory's Schedule could escape the Agreement's disciplines by commissioning another agency of government, not itself

⁸¹ WT/DS163/R (June 19, 2000).

⁸² *Id.* para 7.36.

⁸³ Other WTO Members took derogations on airport matters in their Schedules because of the Korea's legislation. *Id.* para 7.36.

listed in that signatory's Schedule, to procure on its behalf.⁸⁴

The Panel also found that nullification and impairment refers not only to the benefit conferred by a concession but also to expectations in negotiation of a trade agreement.⁸⁵ This constrains the ability of governments to make ad hoc changes to the scope and coverage of their obligations under the GPA through new entities.

ii. The Trondheim Case⁸⁶

This GATT-era case is important because the findings suggest that justifying discriminatory procurement contracts for research and development purposes under the exceptions of the former GPA under the GATT, the so-called GATT Code,⁸⁷ will only be successful if there is sufficient evidence both of the link between the research and the contract, and that the principle purpose of the procurement is for R&D. Further, it confirmed that within the GATT/WTO system, damages are not awarded to compensate for past harm caused by violations of the agreements. This is not necessarily the case with domestic procurement bid challenge systems.

The case involved a dispute between the US and Norway and concerned a contract related to electronic toll collection equipment. The toll system was awarded through single tendering to a Norwegian company, by the Norwegian Public Roads Administration.⁸⁸

The US contended that this procurement process was prohibited under the Tokyo Round Agreement,⁸⁹ which states that a procurement entity may only use single tendering under certain conditions, such as 'when an entity purchases prototypes or a first product which are developed at its request in the course of, and for, a particular contract for research, experiment, study or original development.' The US alleged that Norway was not meeting its obligations under Art. II:1 GATT to accord to the products and suppliers of other Parties treatment no less favourable than that accorded to domestic products and suppliers.

According to the GATT Panel, it was incumbent upon Norway as the respondent to prove that its invocation was justified. The Panel found that Norway had not claimed or shown that the Public Roads Administration had plans to procure further toll ring systems on the basis of the model developed at Trondheim. Further, that Norway had not shown or claimed that the principal purpose of the Norwegian Public Roads Administration had been the procurement of the results of research and/or development rather than operational toll collection equipment as part of a functioning toll ring system. The Panel recommended that Norway ensure that the entities listed in the Norwegian Annex to the Agreement conduct public procurement in conformity with their obligations under the Agreement. This case continues to be cited today because it

⁸⁴ *Korea – Measures Affecting Government Procurement*, Report of the Panel, WT/DS163/R, 1 May 2000. Para 7.59.

⁸⁵ Available at http://www.wto.org/english/tratop_e/dispu_e/cases_e/1pagesum_e/ds163sum_e.pdf.

⁸⁶ GATT Panel Report, *Norway – Procurement of Toll Collection Equipment for the City of Trondheim*, GPR.DS2/R (May 13, 1992) [hereinafter *The Trondheim Report*].

⁸⁷ This was negotiated during the Tokyo Round of Multilateral Trade Negotiations; with only 12 signatories it entered into force on Jan. 1, 1981, continued in effect through 1996.

⁸⁸ See Petros Mavroidis, *Public procurement Agreement – The Trondheim Case: the Remedies Issue*, 48 Swiss Rev. Int'l Econ. Rel. 77 (1933). 306 Vol. 1:299.

⁸⁹ Specifically Article V:15(e).

highlighted absence of real remedies available once the contract has been completed. That is, WTO panel recommendations are prospective only.

iii. Belgian Family Allowances⁹⁰

This landmark dispute was the first GATT case to find that a governmental social policy violated non-discrimination trade rules.

The complaint was brought by Norway and Denmark regarding a Belgian law that levied a 7.5 percent charge on foreign goods that were purchased by public bodies when these goods originated in a country whose system of family allowances did not meet specific requirements. Belgium granted exemption from the levy to products purchased by public bodies when they originated in Luxemburg and the Netherlands, as well as in France, Italy, Sweden and the United Kingdom (UK) but not other GATT contracting Parties, including Denmark and Norway.⁹¹

The Panel found that the Belgian legislation was discriminatory in granting an exemption based on certain conditions. The measure was inconsistent with the provisions of Art. I and based on a concept that was difficult to reconcile with the spirit of the GATT.

This finding implies that, even if based on domestic social policy, a WTO Member cannot justify discriminatory procurement legislation under GATT articles I or III. Nevertheless, as indicated in the US-Shrimp Case, an Art. XX exception can permit a trade restriction based on domestic environmental and possibly social policy in an exporting country, as long as it is not applied on a discriminatory basis. Belgium did not go on to justify the measure as an exception. However, some commentators have argued that this particular measure would still have been considered an unjustifiable discrimination if it were to be examined under the current GATT Art. XX exceptions for social, environmental and health measures.⁹² Despite the landmark nature of this dispute, it is questionable how relevant it is today in light of the more recent Appellate Body case law on Arts. III and XX.

IV. GATS including any relevant disputes

The General Agreement on Trade in Services (GATS) could apply to public procurement for green innovation of services. But even if 'trade in services' according to one of the four modes of supply was found, measures for public procurement are exempted from MFN obligations (Art. II GATS), market access obligations (Art. XVI GATS), and national treatment obligations (Art. XVII GATS).⁹³ Instead, Art. XIII.2 GATS foresees 'multilateral negotiations on public procurement in services'.⁹⁴ The provision solely exempts procurement of services that are not destined 'for commercial resale' or for 'commercial sale'. A state could prove that another state had commercially resold services that it had labelled as public procurement of innovation, the GATS could

⁹⁰ GATT Panel Report Adopted 7 November 1952 (G/32 - 1S/59)

⁹¹ The Panel found that the levy was collected only on products purchased by public bodies for their own use and not on imports as such. Further, that the levy was charged when the purchase price was paid by the public body and therefore should be treated as an 'internal charge as determined by paragraph 2 of Article III of the General Agreement. *Id.* Para 2.

⁹² S. Charnovitz, *Belgian Family Allowances and the challenge of origin-based discrimination*, World Trade Review 4, pp. 7-26 (2005).

⁹³ See Art. XIII GATS. The article is a replication of Art. III.8(a) GATT.

⁹⁴ Art. XIII.2 GATS.

fully apply to such activity by the state. A further question is whether public procurement for green innovation could always be proved to 'be purchased for governmental purposes', as described in Art. XIII.1 GATS.

Art. XIV GATS could potentially justify a procurement measure favouring 'green' services over conventional services for legitimate policy reasons. It provides a defence of public procurement measures for green innovation, which violate the GATS. Again these must be justified as necessary 'to protect human, animal or plant life or health' (Art. XIV(b) GATS). They must also be shown to be non-discriminatory. WTO members have so far included specific commitments on environmental services in their schedules.⁹⁵ Environmental commitments within the GATS have also been part of the services negotiations under the Doha Round.⁹⁶

V. Regional Procurement Frameworks

In addition to the WTO legal frameworks regulating Members' public procurement systems, regional trade agreements may also include provisions that can constrain the extent to which public procurement can promote green innovation. Two-thirds of the RTAs notified to the WTO since 2000 include provisions related to public procurement, and about 28 percent of extant RTAs treat public procurement in a comprehensive way.⁹⁷ The European Union currently holds the most comprehensive regional procurement framework.

i. The European Union

The WTO GPA is incorporated into EU law by Council Decisions⁹⁸ requiring that the EU Member States embody its content into their national laws and regulations. As such, with respect to procurement contracts above the threshold values, EU law and the domestic laws of the Member States reflect principles of the GPA. For contracts below the thresholds, national rules are not bound by EC Directives. Nevertheless, while each Member State has its own public procurement rules, they must conform to the general principles of the TFEU providing for non-discrimination with respect to goods and services.

The EC Directives issued for implementing the GPA include a ban on discrimination, open access to all EU suppliers, transparency in award procedures, a precise indication of which of the permissible award procedures has been chosen, compliance with technical requirements and transparency of the procedures for selecting contractors and awarding contracts. The public procurement directives include:

- The Public Sector Directive (2004/18) applies to service, supply or works contracts entered into by public bodies other than utilities in relation to a utility activity and also covers any central, regional or local government body.
- The Utilities Directive (2004/17) applies to service, supply or works contracts entered into by utilities (i.e. public and certain private bodies operating in the

⁹⁵ See http://www.wto.org/english/tratop_e/serv_e/environment_e/environment_e.htm

⁹⁶ See http://www.wto.org/english/tratop_e/serv_e/s_negs_e.htm.

⁹⁷ Robert D. Anderson, Anna C. Müller, Kodjo Osei-Lah, Josefito Pardo de Leon and Phillipe Pelletier. *Public procurement Provisions in Recent Regional Trade Agreements in: The WTO Regime on Public procurement: Challenge and Reform*, Cambridge University Press.

⁹⁸ Council Decisions N 94/800/EC December 22, 1994.

water, energy, transport and postal services sectors) which relate to a utility activity.

- The New Remedies Directive dealing with remedies under the public procurement rules (2007/66).⁹⁹

When procuring for green innovation, the EU procurement directives allow for exceptions to be made for environmental purposes.¹⁰⁰ Certain national defence contracts are also excluded from the Directives.¹⁰¹ Technical requirements can include innovative environmental factors although specifications relating to the goods or services being procured must not be drawn so as to discriminate against other EU Member States. An EU Member State may derogate from the free movement of goods to protect 'mandatory interests' such as environmental protection. The measure must however be proportionate. In sum, non-discriminatory product-related specifications as to the environmental performance of products are permitted in the EU, provided that these requirements a) have not already been harmonised at Community level, b) that they relate to environmental justification, and c) that they are no more restrictive of intra-Community trade than necessary.¹⁰²

The Treaty Founding the European Union (TFEU) also includes provisions that regulate the ability of Member States to grant aid to stimulate green innovation if it 'distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods . . . in so far as it affects trade between Member States'.¹⁰³ The European Commission has stated that 'a tender procedure guaranteeing full competition can be taken as an important indicator that the [procurement contract is at] market price and that there is no State Aid. Complying with procurement rules will in these cases therefore also help in ensuring respect of the State Aid provisions'.¹⁰⁴

The rule of thumb is that State Aid can be said to be present if the contractual terms of a particular procurement are not normal commercial terms or if the contract does not reflect a genuine need. The commercially advantageous procurement contract must also come directly or indirectly from the resources of a state and be imputable to the state.

ii. The NAFTA

The North American Free Trade Agreement between Canada, Mexico and the US contains a comprehensive procurement chapter. This sets out both procedural and substantive provisions to ensure transparent and non-discriminatory procurement practices as between the Parties, including establishing a bid challenge mechanism.¹⁰⁵

⁹⁹ This Directive was in response to the criticism that the 2004 Directives did not provide an adequate level of protection of contractors' rights, particularly in the areas of injunctive relief and remedies post contract award.

¹⁰⁰ Paragraph 6 of Directive 2004/18/EC states that 'nothing in this Directive should prevent the imposition or enforcement of measures necessary to protect public policy, public morality, public security, health, human and animal life or the preservation of plant life, in particular with a view to sustainable development, provided that these measures are in conformity with the Treaty.'

¹⁰¹ Many EU Member States have used exemptions in the Directives or the TFEU, most notably Article 346, to exempt almost all defence and sensitive security procurements from competition.

¹⁰² Peter Kunzlik, *International Procurement Regimes and the Scope for the Inclusion of Environmental Factors in Public Procurement*, 3 OECD Journal on Budgeting (2003).

¹⁰³ TFEU Articles 107-109.

¹⁰⁴ The European Commission, *Frequently Asked Questions about State Aid*, 2007.

¹⁰⁵ NAFTA Article 1017.

The agreement prohibits offsets¹⁰⁶ but establishes a joint programme to promote procurement opportunities for small and medium sized enterprises.¹⁰⁷ In the US, the federal government explicitly aims to award at least 23 percent of its roughly \$400 billion in annual procurement contracts to small businesses, with lower targets for businesses owned by women, disabled veterans and the economically disadvantaged.¹⁰⁸ Federal procurement contracts between \$25,000 and \$100,000 are typically reserved for small businesses.¹⁰⁹

The US and Canada are simultaneously Parties to the WTO GPA, unlike Mexico. The WTO GPA provisions are stricter than the NAFTA both in terms of non-discrimination but also in its dispute settlement mechanism. Consequently, when the US House of Representatives passed a stimulus bill that provided a 25 percent competitive margin for US iron and steel companies in state purchasing, Mexico and Canada faced different treatment from the US. The bill was challenged by the EU and Canada in the WTO with the result that the final version of the legislations explicitly stipulated that the rule must be compatible with US international obligations, including the WTO GPA obligations which assure other Members of the WTO GPA access to US procurement markets covered under the agreement. As a non GPA Party, Mexico did not benefit from the protections offered under the GPA, and remained subject to the discriminatory measure.

Clearly, an RTA such as the NAFTA offers more flexibility than the WTO to promote indigenous green innovation through procurement. Not only was the US permitted to implement its 'Buy America Act' but, the NAFTA initially allowed Mexico's national oil and electric companies to set aside one half of their procurement each year for domestic suppliers.¹¹⁰ NAFTA also allowed Mexico to impose local-content requirements for turnkey construction projects. For capital intensive projects, Mexico negotiated set asides for as much as 25 percent for local inputs, and up to 40 percent Mexican content for labour intensive projects.

The NAFTA defines a technical specification as that which sets out:

'goods characteristics or their related processes and production methods, or services characteristics or their related operating methods, including the applicable administrative provisions. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a good, process, or production or operating method.'¹¹¹

Environmental characteristics are therefore included under this definition and subject to Article 1007(1) which:

¹⁰⁶ NAFTA Article 1006.

¹⁰⁷ NAFTA Article 1021.

¹⁰⁸ Section 15(g)(1) of the Small Business Act reads: The Government wide goal for participation by small business concerns shall be established at not less than 23 per cent of the total value of all prime contract awards for each fiscal year.

¹⁰⁹ See 15 USC 644(g)(1) or the Federal Acquisitions Regulations, Section 19.502-2.

¹¹⁰ This was phased out by 2003.

¹¹¹ NAFTA Article 1025.

‘requires that procuring entities do not design technical specification with the aim or effect of creating unnecessary obstacles to trade. There is ambiguity over whether the wording of the first sentence of NAFTA’s definition of ‘technical specification’ serves to exclude non-product-related PPM requirements from qualifying as ‘technical specifications. This is because it only refers to PPMs relating to ‘goods characteristics’ not to those that do not relate to characteristics of those goods.’¹¹²

As with the WTO GPA Art. XXIII, the NAFTA exceptions permit the Parties to undertake measures necessary to protect human, animal or plant life or health,¹¹³ provided that such measures are not applied in a manner that would constitute a means of arbitrary or unjustifiable discrimination.

iii. Japan RTAs

Japan is a Party to the WTO GPA and has also chosen to negotiate public procurement provisions in its RTAs. Several of Japan’s RTAs include procurement provisions. These bilateral procurement regimes are often minimal when signed with other Members of ASEAN. The agreements with Thailand, Malaysia and Philippines do not contain any substantive obligations to liberalize procurement markets. They are focused only on institutional matters. The agreement between Japan and Mexico is more comprehensive but does not incorporate Japan’s commitments under the WTO GPA. The most notable agreement examined here is the Japan-Singapore RTA, which extends its obligations under the GPA by lowering the threshold values.¹¹⁴

iv. Comparative Overview

This overview suggests that all the procurement agreements examined provide for domestic regulatory discretion to promote green innovation to various degrees. However, this procurement must be conducted within the framework of transparency predictability and non-discrimination. In principle, this rules out the use of public procurement for quasi-industrial policy purposes.

The agreements are not identical however. Most notable differences can be seen in how the agreements permit technical specifications that address the environmental impacts associated with non-product-related production process methods (npr-PPMs). The WTO GPA places few constraints on the use of non-product related production process methods, the EU appears to restrict the use of npr-PPMs, while the NAFTA exhibits some ambiguity among the various relevant provisions.

Further differences emerge from the use of non-price factors in contract award criteria. This is permitted in all these regimes but while the EU mandates the selection of the ‘most economically advantageous’ tender, the GPA uses the more permissive term ‘most

¹¹² See Kunzlik. Op cit. p135.

¹¹³ NAFTA Article 1018:2(b).

¹¹⁴ Japan Singapore Agreement Article 101 states that procurement in Annex 4 to the WTO Agreement shall apply *mutatis mutandis* to procurement of goods and services specified in Annex VIIA, by entities specified in Annex VIIB. While the threshold for a procurement covered by the provisions of this Chapter is SDR 100,000.

advantageous.’ The relative newness of this area of procurement law means that several areas of ambiguity have not yet been addressed through case law.

v. Preliminary conclusions

Several legal frameworks potentially condition how governments use public procurement for green innovation at national, regional and international levels. Within the WTO, the plurilateral Public Procurement Agreement (GPA) applies only to the 40 signatory parties. Broadly speaking, there is sufficient flexibility under the GPA to promote green innovation through public procurement without violating the terms of the agreement. However, the procurement process of those entities covered by the GPA must be transparent and non-discriminatory, in conformity with the cornerstone principles of the agreement.

A signatory party seeking to use procurement contracts to support domestic industries developing green innovations may not build local content requirements into any procurement contract valued above the financial thresholds covered by the provisions of the GPA. This is because domestic offsets are generally considered to violate the cornerstone principles of national treatment and non-discrimination. Nevertheless, non-conforming green innovation procurements may be excluded from the obligations of the GPA either *ex ante* through not including strategic entities or markets from the coverage of the agreement in negotiations, or *ex post* by justifying the measure under the Art. XXIII exceptions relating to security, the environment or human health.

Of relevance to policies promoting small and medium sized enterprises (SMEs), smaller green innovation contracts will be excluded from the national treatment and non-discrimination provisions if they fall below the threshold values determining coverage. While the US explicitly negotiated provisions to promote SMEs within both their GPA and NAFTA commitments, the EU has a wider SME policy set out in the 2008 Small Business Act.¹¹⁵

The General Agreement on Trade in Services (GATS) could apply to public procurement for green innovation of services. If the GATS is applicable to a procurement measure, Art. XIV GATS could potentially justify a procurement measure favouring ‘green’ services over conventional services for legitimate policy reasons. It provides a defence of public procurement measures for green innovation that violate the GATS, namely the necessity ‘to protect human, animal or plant life or health’. Environmental commitments within the GATS have also been part of the services negotiations under WTO Doha Round.

Outside of the WTO, regional level agreements also increasingly include procurement laws. The EC Directives ban discrimination to ensure open access to all EU suppliers but makes exceptions for environmental and defence purposes. A tender procedure guaranteeing full competition is deemed to be an important indicator that the contract is at market price and that there is no state aid. The North American Free Trade Agreement between Canada, Mexico and the US includes both procedural and substantive provisions to ensure transparent and non-discriminatory procurement practices along with a requirement for a bid challenge mechanism. The agreement prohibits offsets but permits measures necessary to protect human, animal or plant life

¹¹⁵ Available at http://ec.europa.eu/enterprise/policies/sme/small-business-act/index_en.htm

or health. Several of Japan's RTAs also include procurement provisions, although these are often restricted to institutional matters. The Japan-Singapore RTA is notable because the agreement lowers the procurement threshold values below Japan's obligations under the WTO GPA.

Country studies

Introduction

In the following section we will assess and compare the approaches of four major OECD countries, first, in the areas of public procurement of innovation and green public procurement and, second, specifically in the area of public procurement for green innovation. Countries of study shall be the United Kingdom, Germany, the US and Japan. After a comparison of the general frameworks of the four countries, the study will evaluate how widespread their efforts for public procurement for green innovation are and whether the regulating provisions in place are of a voluntary or mandatory nature. A short introduction on the importance of each of the four countries for the present assessment shall be given.

1. United Kingdom

The United Kingdom has launched several initiatives for a greener and more innovative public procurement during the past years. In its Sustainable Development Strategy (2005), the UK government sought to become the EU leader in ‘sustainable public procurement’ by 2009,¹¹⁶ and aimed to achieve this through goals including the use of public procurement to see that their information and communication technology would be carbon neutral by 2012.¹¹⁷ The UK is also the country that most systemically promotes public procurement of innovation.¹¹⁸ Although it had certain sectoral policies relating to PP of innovation in place from the 1970s, a systematic approach to public procurement of innovation was only developed in recent years.

General Procurement Structure

The UK public procurement budget amounts to around £150 billion per annum, or 13% of GDP. The main bodies dealing with procurement law and practice are organized on a regional basis. In England, the Office of Government Commerce deals with central public procurement while the Office of the Deputy Prime Minister deals with local government purchasing policy. In Scotland, Wales and Northern Ireland the procurement agencies are the Scottish Executive, Value Wales and the Central Procurement Directorate, respectively.

As treated above, public procurement activities in the UK must conform to the requirements of the EU Procurement Directives and the UK Procurement Regulations that translate the Directives into national law.¹¹⁹ The EU WTO GPA schedules indicate that EU Member States’ government contracts awarded in connection with activities in

¹¹⁶ CSR Europe, *Sustainable Public Procurement*, p. 2 (2009). Available at www.csreurope.org/.../20091001_csr_europe_helpdesk_for_epson__sustainable_public_procurement__final.pdf, p. 26.

¹¹⁷ *Id.*, at 28.

¹¹⁸ Edler, *Bedürfnisse als Innovationsmotor*, p. 68 (2007).

¹¹⁹ Available at http://www.ogc.gov.uk/procurement_-_the_bigger_picture_policy_and_standards_framework.asp.

the fields of drinking water, energy or of fuels for the production of energy, transport or telecommunications are not subject to the obligations of the agreement.¹²⁰

Green Public Procurement

The Government of the United Kingdom has made efforts to promote green purchases in the public sector. On the basis of the above-mentioned Sustainable Development Strategy (2005),¹²¹ the report 'Procuring the Future', which delivered the findings and recommendations of the UK Sustainable Procurement Task Force, suggested that the UK should take a systematic approach to green procurement.¹²² It serves as the basis for the current approach.

Defra's¹²³ Sustainable Products and Consumers team is responsible for the UK's sustainable public procurement policy and product specifications, as well as for the achievement of the UK target for the EU's Green Public Procurement initiative. This policy is designed to allow purchasers across the public sector to take account of environmental factors when buying goods, services or works. The UK's green public procurement scheme covers product groups, which have a high impact on the environment such as construction, food and catering services, and transport. It is a complement to the Eco-label scheme, which provides suppliers of products and services with an environmental benchmark for their production and performance. This requires that 50 percent of procurement tenders should be 'green' by 2010. According to a PwC study, this goal has already been far exceeded, as 75% of all procurement purchases in the UK took green criteria into consideration in 2009.¹²⁴ The procurement scheme sets minimum, 'core' criteria as well as best practice 'comprehensive' specifications for a range of product groups. Core criteria address the most significant environmental impacts while comprehensive criteria are intended for procurers who wish to purchase the best environmental products available.¹²⁵ Although these criteria are voluntary for public agencies, they seem to be well complied with.

The online progress review from the London Mayor's Green Procurement Code measures each public agency's progress in green procurement. This is a self-assessment tool covering requirements for green procurement such as training staff and including green procurement requirements in job descriptions, policy strategies, standard specification and, identifying key suppliers. The review measures both the systems and

¹²⁰ The General Notes and Derogations from the Provisions of Article III Of Appendix I of the EC.

¹²¹ CSR Europe, *Sustainable Public Procurement*, p. 2 (2009). Available at www.csreurope.org/.../20091001_csr_europe_helpdesk_for_epson__sustainable_public_procurement__final.pdf.

¹²² Available at <http://www.defra.gov.uk/publications/files/pb11710-procuring-the-future-060607.pdf>, p. 24.

¹²³ Defra is the UK government department responsible for the environment, for food, farming and for rural affairs.

¹²⁴ PricewaterhouseCoopers, *Significant and Eco-fys: Collection of statistical information on Green Public Procurement in the EU*, p. 35 (2009). Available at ec.europa.eu/environment/gpp/pdf/statistical_information.pdf.

¹²⁵ Available at <http://www.actionsustainability.com/news/227/Targets-and-benefits-of-Green-Public-Procurement-in-the-UK/>.

processes in place to implement green procurement and the achievements in green procurement against targets.¹²⁶

Public Procurement of Innovation

Systematic public procurement efforts to trigger innovation are fairly recent in the UK, as well as in Germany.¹²⁷ Due to its current approach, however, Edler views the UK as a model of 'good practice' for public procurement of innovation in other countries.¹²⁸

The Technology Programme by the UK Department for Trade and Industry (DTI) from 2003 provided the first systematic effort to stimulate individual markets to innovate the goods and services used by governments and catalyse the market. The DTI has produced several reports on promoting innovation in procurement¹²⁹ and has worked with the Department for Business Innovation and Skills to provide support for R&D and innovation, through for example, the Technology Strategy Board. Government funding is provided for venture capital through the UK Innovation Investment Fund, while tax relief is available for technological R&D.

By 2008, the White Paper 'Innovation Nation' committed each Government Department to create an Innovation Procurement Plan (IPP) as part of its commercial strategy, setting out how the Department would embed innovation in its procurement practices and to seek to use innovative procurement mechanisms.¹³⁰

Through its 'Forward Commitment Procurement' program, the UK actively pursues a pre-procurement approach in order to assess the future innovation demand of the market and in order to communicate potential procurers' needs to potential suppliers as well as suppliers' knowledge of potential technological solutions back to procurers. A similar initiative, working with the market to develop specifications for green products or technologies, with an eye to bringing about innovation in these areas has been adopted by Sweden.¹³¹ None of the other countries of study, however, have taken a systematic pre-procurement approach so far.

Notable examples of using public procurement for innovation in the UK include the purchasing strategy of the National Health Service (NHS), using the expertise of the NHS Institute for Innovation and Improvement and the National Innovation Centre

¹²⁶ The Mayor of London's Green Procurement Code, *available at* www.greenprocurementcode.co.uk/?q=node/48

¹²⁷ Edler, *Bedürfnisse*, pp. 83, 154.

¹²⁸ Edler, *Bedürfnisse*, p. 83.

¹²⁹ *See e.g.* Capturing Innovation guidance, *available at* www.ogc.gov.uk/embedded_object.asp?docid=1001717; Embedding Innovation in Procurement Practice - DTI 5 Year Programme, *available at* <http://www.dti.gov.uk/fiveyearprogramme.html> and The OGC Report: Competition and Long-Term Capacity Planning in the Government Marketplace, *available at* www.ogc.gov.uk/embedded_object.asp?docid=1001394.

¹³⁰ UK Government Department for Business Innovations and Skills, 2008: 'Innovation Nation' - Procuring for innovation, innovation for procurement, White Paper, online: http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/i/innovation_percent20procurement_percent20plans.pdf.

¹³¹ Fraunhofer, p. 24

approach so far does not exist, however, for public procurement for green innovation. Individual examples could point to good practice for future initiatives.¹³⁴

An example is the Renewable Heat Initiative for the research and development of renewable heat technology.¹³⁵ The government first developed the requirements for the technology in consultation with energy-industry trade associations, NGOs and potential developers. It then issued an EU-wide tender in 2010 setting out specific criteria: The technology should be applicable to different ways of heating, to different scales in buildings, and should be commercially viable by 2012.¹³⁶ The steps of the tendering process were set out transparently on the internet.¹³⁷ A first policy review is planned for 2014.¹³⁸ The government launched the public procurement initiative, as it considered that the private sector would not sufficiently invest into innovation of the technology on its own to achieve the UK's target of 15 percent renewable energy in the energy mix by 2020.¹³⁹

The UK government has also used public procurement for the development of a carbon capture and storage (CCS) pilot power plant.¹⁴⁰ The aim was to help private developers with overcoming technical and commercial risks and uncertainties in the development and deployment of CCS technologies. The issued tender contains funding for research on CCS technology and setting up pilot CCS sites. Clearly defined criteria included that the pilot plant should use post-combustion capture technology and store the sequestered CO₂ in offshore geological sites. Further, the technology should be able to sequester 90 percent of CO₂ and to demonstrate the whole project cycle (capture, transport and storage) by 2014, while reaching an electrical output of at least 300 MW. Finally, the project should be built in the UK.¹⁴¹

In the area of stimulating green transport innovations, it was estimated that in 2007 the Department for Transport (DfT) spent £5 million per year on grants designed to support UK based low carbon road vehicle technologies at the research and pre-competitive development stages.¹⁴² The DfT also provides grants for the testing and demonstration of infrastructure for alternative fuels and vehicles – including infrastructure for biofuels, electric vehicles and hydrogen. 2007 grant funding for infrastructure projects was estimated at around £0.5m per annum. The Engineering and Physical Sciences Research Council (EPSRC) is currently the main funder of transport research in the UK, within the region of £50-60million per annum for all transport-related areas.

¹³⁴ This is also suggested by the *Procuring the Future* report, p. 24, available at <http://www.defra.gov.uk/publications/files/pb11710-procuring-the-future-060607.pdf>.

¹³⁵ Available at

www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/incentive/incentive.aspx

¹³⁶ Available at www.decc.gov.uk/en/content/cms/consultations/rhi/rhi.aspx

¹³⁷ Available at

www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/incentive/incentive.aspx

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ Available at <http://www.berr.gov.uk/files/file42478.pdf>. See also

<http://webarchive.nationalarchives.gov.uk/+http://www.berr.gov.uk/whatwedo/energy/sources/sustainable/ccs/ccs-demo/page40961.html>

¹⁴¹ UK Department for Business Enterprise & Regulatory Reform, *Competition for a Carbon Dioxide Capture and Storage Demonstration*, Project Information Memorandum, p. 8 (2007).

¹⁴² See www.est.org.uk/fleet/funding/lowcarbonresearch/.

A hydrogen fuel-cell and carbon abatement technology demonstration fund was also launched in 2006. £15m of this fund has been allocated to technology demonstration of fuel cell and hydrogen technologies. Transport related applications benefit from a share of this funding. The UK Government also provides funding of an initial £20m to support a new programme aimed at accelerating the market penetration of lower carbon vehicles and reducing the barriers faced by companies in moving from prototype demonstrations of lower carbon technologies to full commercialisation. This programme provides financial support for public procurement of fleet demonstrations of lower carbon vehicles (and where appropriate supporting infrastructure). The programme builds on the model of contractual Forward Commitments discussed above, in which commitments to purchase vehicles are linked to the achievement of predetermined cost and performance criteria. An additional £10m research and development fund was launched in March 2011 that is designed to accelerate growth in low carbon transport technologies and support the emergence of green auto manufacturers in the UK. The new fund was part of a package of government measures that would encourage domestic entrants into the low carbon vehicle sector and overcome the financial difficulties experienced by a number of green car start ups.

2. Germany

An assessment of policies for public procurement for green innovation in Germany will be beneficial, as Germany is one of the most innovative economies in the world¹⁴³ and has strongly focused its efforts on green innovation, for example through the development of renewable energy technologies.

General procurement structure

The procurement budget of public entities in Germany accounts for €260 billion in purchases per year, and thereby for 12% of GDP.¹⁴⁴ General public procurement practices in Germany are subject to GPA commitments, the EU Procurement Directives, as well as national legislation, which must conform with the GPA¹⁴⁵ and with EU law. National laws on public procurement include the Act against Restraints on Competition (GWB, ‘Gesetz gegen Wettbewerbsbeschränkung’), the Public Tender Regulation (VgV, ‘Vergabeordnung’)¹⁴⁶, and sector-specific regulations, such as the Contract Awards for Public Supplies and Services (VOL/A, ‘Vergabe- und Vertragsordnung für Leistungen’).

Equally applicable to the UK and Germany, the EU WTO GPA schedules indicates that EU Member States’ government contracts awarded in connection with activities in the fields of drinking water, energy or of fuels for the production of energy, transport or telecommunications are not subject to the obligations of the agreement.¹⁴⁷

Green public procurement

Major initiatives for green public procurement in Germany have so far come from the EU Commission. The ‘Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan’ was introduced in 2008, aiming at promoting green public procurement in EU member states.

The German government reformed the GWB, the VgV and the VOL/A in 2009 and included the standards for environmental considerations from Art. 26 of the EU Directive 2004/18/EC.¹⁴⁸ In reaction to the EU Directive ‘on the promotion of clean

¹⁴³ Aschhoff, Innovation in Germany, (2005). Available at ftp://ftp.zew.de/pub/zew-docs/mip/05/MIP05_engl.pdf.

¹⁴⁴ Jäkel et al., p. 9.

¹⁴⁵ All procurement tenders in the EU need to be opened and equally favourable conditions to be granted to GPA member states. See <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0018:EN:HTML>, Art. 5.

¹⁴⁶ Available at http://www.dstgb-vis.de/home/aktuelles_news/aktuell/bundesrat_stimmt_aenderung_der_vgv_und_sektvo_zu/vergabeverordnung_vgv_2011_endfassung.pdf.

¹⁴⁷ The General Notes and Derogations from the Provisions of Article III Of Appendix I of the EC.

¹⁴⁸ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0018:EN:HTML>, Art. 26. The provision says ‘Contracting authorities may lay down special conditions relating to the performance of a contract, provided that these are compatible with Community law and are indicated in the contract notice or in the specifications. The conditions governing the performance of a contract may, in particular, concern social and environmental considerations.’

and energy-efficient road transport vehicles' in 2009, the German parliament further amended the Public Tender Regulation (VgV) to consider the life-cycle energy consumption and environmental effects of new cars in a procurement process. The amended Regulation leaves it up to public agencies to either include energy efficiency aspects in the tender requirements or to simply impose them *ex post* on the winner of the tender.¹⁴⁹ As, according to PwC, only 30 percent German public agencies consider environmental criteria in their procurement procedures, the impact of this voluntary guideline seems to be weak so far¹⁵⁰, particularly in comparison with the UK.¹⁵¹

Despite several requests of the EU Commission, such as the proposal to increase green public procurement to 50 percent of total procurement by 2010, the German government has not yet established a national action plan to introduce environmental criteria into public procurement.¹⁵² A website for green procurement is meant to provide information on the legal framework and successful products of green innovation.¹⁵³ It provides public entities with best practices and informs them about the legal and financial frameworks for green public procurement. It is, however, not more than a platform for exchange.

Some individual projects and sector specific approaches for green procurement have been established by public agencies in Germany during the past years. They could serve as starting points for a more widespread use of the concept.

Since 2007, the German government requires public agencies to procure wood from sustainable forestry instead of tropical wood.¹⁵⁴ In 2008, the government implemented a general regulation for the procurement of energy-efficient products and services.¹⁵⁵ The regulation demands a needs assessment for energy efficient solutions and demands to include energy consumption during the lifecycle of a product into consideration. It further asks the state to apply the standards of environmental certificates (ex. Energy Star) and to require environmentally friendly and energy efficient contract conditions from tendering actors. The government has nominated the 'Green Procurement Working Group' (Grüner Einkauf), which monitors the implementation of the regulation and promotes the application of same standards on state level.

A concrete example of green procurement is an initiative from the city of Freiburg in 2008. Freiburg established a EU-wide invitation to tender with the aim to replace more than 2/3 of its car fleet with natural gas passenger cars. The criteria and their weighting were published before-hand: 60 percent of weighting was given to the costs of the cars,

¹⁴⁹ Available at http://www.dstgb-vis.de/home/aktuelles_news/aktuell/bundesrat_stimmt_aenderung_der_vgv_und_sektvo_zu/vergabeverordnung_vgv_2011_endfassung.pdf, § 4.9 VgV

¹⁵⁰ PricewaterhouseCoopers, Significant and Ecofys: Collection of statistical information on Green Public Procurement in the EU, p.5 (2009). Available at ec.europa.eu/environment/gpp/pdf/statistical_information.pdf.

¹⁵¹ Thomson, J, Jackson, T, *Sustainable procurement in practice: Lessons from local government*, 50 Journal of Environmental Planning and Management, p. 425 (2007).

¹⁵² Germanwatch, *Klimaverträgliche Öffentliche Beschaffung*, p. 5 (2010). Available at www.germanwatch.org/klima/pos-kb.pdf.

¹⁵³ The website is available at <http://www.umweltbundesamt.de/produkte/beschaffung>.

¹⁵⁴ Available at http://www.verwaltungsvorschriften-im-internet.de/bsvwvbund_22122010_NII4421040.htm#ivz3

¹⁵⁵ Available at <http://www.bmwi.de/BMWi/Redaktion/PDF/A/aav-zur-beschaffung-energieeffizienter-produkte,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>. The regulation was created as a reaction to EU Directive 2006/32/EC on energy efficiency.

20 percent to their yearly fuel costs, 10 percent to the classification of the cars by insurances, and 10 percent to the CO₂ emissions of the cars. The three last criteria generally perform in favour of natural gas cars, as natural gas has lower costs than gasoline and diesel, as insurance classifications for natural gas cars are lower in terms of insurance fees, and because natural gas cars emit less CO₂.¹⁵⁶ The initiative aimed to encourage domestic entrants into the low carbon vehicle sector and to overcome the financial difficulties experienced by a number of green-car start ups.

Public procurement of innovation

As opposed to the recent UK approach, innovation policy in Germany is mainly pursued through supply instruments instead of demand instruments. The government focuses on improving the innovative activities of the private sector through incentives and a stable investment framework. Also the commercialization of potential innovations has traditionally been supported with supply instruments.¹⁵⁷

The competence for research and innovation is divided between the Ministry of Education and Research (BMBF) and the Ministry of Economics and Technology (BMWi). Public procurement to achieve innovation has never been systematically practiced by those entities or any other public agency in Germany.¹⁵⁸ There are as yet no guidelines or requirements for a systematic consideration of innovation in the procurement process. In the public procurement reform in 2009 the parliament integrated innovative requirements as potential selection criteria into § 97 GWB, as long as they had an 'objective connection' to procured products.¹⁵⁹ As yet, though, this voluntary criterion has not been considered in most tendering requirements and has therefore largely remained ineffective.¹⁶⁰

The German government has shown its intent to use public procurement to spur innovation in individual instances, such as in 2004 when it published a '7 Point Plan' to modernize public procurement and to strengthen innovation and the use of e-procurement.¹⁶¹ In 2005, the government further launched a working group, the 'Impulskreis Innovationsfaktor Staat', with the aim to assess the potential role of the state in triggering innovation and to propose a new model approach to public

¹⁵⁶ Available at

http://www.umweltbundesamt.de/produkte/beschaffung/doks/beispiel_zum_thema_fahrzeuge_pkw.pdf

¹⁵⁷ Edler, *Bedürfnisse als Innovationsmotor*, p. 153 (2007).

¹⁵⁸ *Id.*, p. 154.

¹⁵⁹ § 97.4 reads as follows: '(4) Social, environmental or innovative requirements are explicitly mentioned as selection criteria. These requirements must have an objective connection to the procured products and must be evident from the specification.'

¹⁶⁰ *Bericht zur Innovationsorientierung öffentlicher Beschaffung* (2009)

¹⁶¹ Available at

www.bescha.bund.de/SharedDocs/Downloads/kabinettsbeschl__Optimierung_20Besch,templateId=per cent3Draw,property=per cent3DpublicationFile.pdf/kabinettsbeschl__Optimierung per cent2520Besch.pdf+,7-

[Punkte+Programm'+oeffentliche&hl=en&gl=ch&pid=bl&srcid=ADGEEsG35GJSKccuCrVRo7SJ_21QM_Gxwspu4Z9XqSuYIqV ar1jhP02kL0e-0V4j4eCvBhcsTwFL6OKgIfPgaU1DsmuLoYXu7121Yi94br4msXOwNZ4X9iexRgqln-KKPzLc05TCSZET&sig=AHIEtbS5kfvGMV7GRKYpZLEXTIo_3wIz8w&pli=1](http://www.bescha.bund.de/SharedDocs/Downloads/kabinettsbeschl__Optimierung_20Besch,templateId=per cent3Draw,property=per cent3DpublicationFile.pdf/kabinettsbeschl__Optimierung per cent2520Besch.pdf+,7-Punkte+Programm'+oeffentliche&hl=en&gl=ch&pid=bl&srcid=ADGEEsG35GJSKccuCrVRo7SJ_21QM_Gxwspu4Z9XqSuYIqV ar1jhP02kL0e-0V4j4eCvBhcsTwFL6OKgIfPgaU1DsmuLoYXu7121Yi94br4msXOwNZ4X9iexRgqln-KKPzLc05TCSZET&sig=AHIEtbS5kfvGMV7GRKYpZLEXTIo_3wIz8w&pli=1)

procurement of innovation.¹⁶² In 2007, six federal ministries in Germany took a joint initiative to promote the use of public procurement of innovation.¹⁶³ Such initiatives could help to achieve a wider acceptance of the benefits of public procurement of innovation in the future.¹⁶⁴

In 2006, the BMBF established the High-tech Strategy 2020, which aims at spurring innovation through close interaction between the state and private actors from early on in the product development process.¹⁶⁵ The ministry initiated several Public-Private Partnerships for research projects on lead markets, such as health, climate and resource efficiency and mobility, and aimed to use synergies between different market actors.¹⁶⁶ Examples for future initiatives in this framework are the development of CO₂-neutral, energy-efficient and climate-adapted cities, an intelligent restructuring of the energy supply system and a more effective protection of communication networks.¹⁶⁷ Generally, the High-tech Strategy 2020 is more a subsidy and R&D support scheme by the government than a direct public procurement initiative. The state will potentially purchase some of the innovations that are triggered through the Strategy, but it does not guarantee the developing firm it will do so.

As an additional incentive mechanism for public agencies, the BMWi and the German Association Materials Management, Purchasing and Logistics (BME) are publically awarding prizes to agencies that have triggered innovation through procurement or have initiated innovative product development. Procurement processes that also promote other goals, such as environmental protection, have better chances of receiving an award.¹⁶⁸

Although there is not yet a systematic approach, there are increasingly examples of the use of public procurement to promote innovation by German public agencies. First, the German government supported the innovation of an electronic road charge system, named Toll Collect in 2003 and 2004. Toll Collect was a PPP with the German companies Daimler and Deutsche Telekom. The government was involved in the innovation process and carried a share of the innovation costs. It 'procured' the system after its innovation by guaranteeing its exclusive installation in Germany. The private partners in the project will receive the first 650 million Euros in revenues from the road charge system. The innovative effect of the system can be seen in the fact that several foreign governments and state governments are interested in procuring it as well.¹⁶⁹

In a second example for public procurement of innovation, the city of Munich aimed to reach innovation in its administrative and software-based processes in order to make them cheaper in the long-term and less dependent on Microsoft products. The city

¹⁶² Jäkel et al., *Innovationsfaktor Staat*, p. 8.

¹⁶³ Beschluss zur verstärkten Innovationsorientierung öffentlicher Beschaffung, 2007, available at <http://www.bmwi.de/BMWi/Redaktion/PDF/B/beschluss-verstaerkte-innovationsorientierung-oeffentlicher-beschaffung,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>. The six ministries were BMWi, BMBF, BMVBS, BMVg, BMI and BMU.

¹⁶⁴ Norden, *Innovative Green Public Procurement of Construction, IT and Transport Services in Nordic countries*, (2009) available at http://www.norden.org/en/publications/publications/2010-529/at_download/publicationfile.

¹⁶⁵ Available at <http://www.hightech-strategie.de/de/350.php>

¹⁶⁶ Available at <http://www.hightech-strategie.de/en/350.php>

¹⁶⁷ BMBF, High-Tech Strategy 2020 for Germany, 2010, available at http://www.bmbf.de/pub/hts_2020_en.pdf.

¹⁶⁸ Available at <http://www.umweltbundesamt.de/produkte/beschaffung/>

¹⁶⁹ OECD, *OECD reviews of innovation policy: China*, p. 568 (2008).

therefore changed the software and the operating system in the computers of its administration to Linux. This move potentially contributed to the development of services and products of open source software.¹⁷⁰

Public procurement for green innovation

The German government has not yet taken a systematic approach to public procurement for green innovation. Apart from what has been mentioned in the previous sections, only individual initiatives can be highlighted in order to describe the potential German approach to integrating green and innovation criteria at the same time into its procurement processes. After the reform of the GWB in 2009 and the integration of both green and innovation aspects as possible criteria for public procurement, public agencies in Germany would have the legal framework to use public procurement for green innovation.¹⁷¹ They have, however, as yet made little use of it, as the mentioned PwC study shows.

A project that demonstrates how German authorities might successfully use public procurement for green innovation to achieve energy efficiency is an initiative by the municipality of Hamburg for new lighting systems in public buildings¹⁷². The municipality set out the goals to reduce the electricity costs from lighting in public buildings to 60 percent of historic rates, and to reduce electricity expenses over the life cycle of the light bulbs. It established an EU-wide tender for the furnishing of all public agency buildings in Hamburg with innovative light bulbs.¹⁷³ After it had financed pilot projects to assess the general functionality of the new light bulbs, and after having had preliminary talks with all potential supply companies in order to assess realistic terms for the tender, the municipality defined specific criteria for the competitive bidding process.¹⁷⁴ Public procurement has clearly triggered green innovation in this example. Over 130 000 light bulbs in 500 public buildings have been exchanged in Hamburg. The project resulted in electricity savings of about 15 million kWh per year and reduced the electricity expenses of the municipality by 2 million Euros per year. Through public demand valued at over €18 million, the new light bulbs gained market access after their development.¹⁷⁵ After the private sector had initially rejected collaboration in the development of the light bulbs due to high initial investment costs and uncertainty of market penetration, many private companies bought the light bulbs once they were on the market.¹⁷⁶

The German KfW Bank, a government-owned development bank, has recently announced that it will expressly promote the development and installation of innovative and energy-efficient lighting systems in German municipalities. The Bank is offering municipal governments low interest rates and consulting support for the implementation of such systems through public procurement processes.¹⁷⁷

¹⁷⁰ Edler, *Bedürfnisse als Innovationsmotor*, p. 155 (2007).

¹⁷¹ § 97.4 of GWB 2009, see fn. 32.

¹⁷² Jäkel, Blind et al., p.16. Edler/Fraunhofer, p. 72.

¹⁷³ Available at <ftp://ftp.cordis.europa.eu/pub/innovation-policy/studies/case1.pdf>, p. 2.

¹⁷⁴ Edler/Fraunhofer, p. 75.

¹⁷⁵ Jäkel, Blind et al., p.16.

¹⁷⁶ Fraunhofer, p. 76.

¹⁷⁷ Available at <http://www.umweltbundesamt.de/produkte/beschaffung/>

3. United States

The United States represents an interesting case study as a nation that has long used its government purchasing power strategically, and one that has expended vast resources on promoting innovation, particularly in the defence sector. We are also now witnessing a growth in awareness, at the highest levels, of the role that the many billions of US procurement dollars can play in promoting environmental sustainability. The United States has a thoroughly procurement structure through which it aggressively pursues its objectives, making it an appropriate country to consider.

General Procurement Structure

Federal procurement in the US is a \$300 billion industry, overwhelmingly dominated by the Department of Defense (which accounted for 68.3 percent of this funding in 2003), followed by the Department of Energy (6.9 percent), the General Services Administration (5 percent), and NASA (3.8 percent).¹⁷⁸ Accordingly, much of this funding goes to major defense and aeronautics companies such as Lockheed Martin and Boeing. At the state level budgets are also significant, with individual states representing multiple-billion dollar procurement markets.¹⁷⁹

US legislation on public procurement must conform to the USA's GPA and NAFTA commitments. The principal set of rules by the US Federal Government derive from the Federal Acquisition Regulation (FAR), which contains the regulations issued by government agencies that dictate the acquisition process.¹⁸⁰ This regulation is issued pursuant to the Office of Federal Procurement Policy Act of 1974, and divides the acquisition process and its requirements into the three phases of: (1) need recognition and acquisition planning, (2) contract formation, and (3) contract administration.¹⁸¹ The office of Federal Procurement Policy also helps to shape the procurement policies of the various federal agencies, and was created in 1974 to 'provide overall direction for government-wide procurement policies, regulations and procedures and to promote economy, efficiency, and effectiveness in acquisition processes.'¹⁸² This process is distinct at the state level, as each state operates its own procurement offices according to policies set at the state level. Similarly, different agencies and Federal Departments enjoy considerable discretion in their procurement policies.¹⁸³ All agencies, however, accept the FAR guidelines, though they may supplement these guidelines according to their own policies.¹⁸⁴

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¹⁷⁸ Fraunhofer, p. 186

¹⁷⁹ *Id.*

¹⁸⁰ United States Federal Acquisition Regulation, *available at* <http://www.faronline.com/>

¹⁸¹ *Id.*

¹⁸² Office of Federal Procurement Policy Website, *available at* <http://www.whitehouse.gov/omb/procurement>

¹⁸³ Fraunhofer, p. 186.

¹⁸⁴ *Id.*, p. 188.

There has been an increasing turn towards green public procurement with the recognition that these policies can play an important part in overall environmental objectives. As a first step, President Obama declared in an executive order in October of 2009 that government agencies 'shall prioritize actions based on a full accounting of both economic and social benefits and costs'.¹⁸⁵ This order was specifically intended to promote, among other goals, greener public procurement by the federal government.¹⁸⁶ This order also directed each agency to adopt its own strategic plan to implement these goals, and set out a concrete series of objectives to be met by each agency in order to comply, specifically including a number of efforts related to procurement.¹⁸⁷

In the transportation industry, an interesting example is New Mexico's 1992 Alternative Fuel Acquisition Act. This act requires that 75 percent of state vehicles purchased after 2003 utilize bi-fuels, alternative fuels, or hybrid drive systems.¹⁸⁸ Similarly, many public agencies fell under a requirement that by 2010 they provide 15 percent of their transportation fuel from alternative sources.¹⁸⁹

Outside of these efforts, the Environmental Protection Agency has also promoted 'Design for Environment' and the reduction of energy use in buildings, as well as the Energy Star rating system, which has widespread public visibility.¹⁹⁰ An order from President Clinton requiring agencies to purchase office equipment that carried the Energy Star label is believed to have triggered the current market dominance of Energy Star labelled products.¹⁹¹ The UK Sustainable Procurement Task Force took the Energy Star scheme, also due to its successes in the Computer sector, as a model for the UK approach.¹⁹²

Public Procurement of Innovation

There is no systematic approach to trigger innovation through public procurement on the federal level or the state level.¹⁹³ Research and innovation initiatives are rather launched, financed and implemented sector-specifically by the respective ministries.¹⁹⁴ Public procurement for green innovation is only voluntarily pursued, where there is a defined need or issue. However, innovation has also been indirectly spurred through requirements in public tenders that the products meet stringent criteria, for example where the Americans with Disabilities Act requires that many federal services be made accessible to handicapped individuals.¹⁹⁵ This requirement in particular has been found to spur innovation by changing the procurement habits of government agencies.¹⁹⁶

¹⁸⁵ U.S. Federal Register, Executive Order 13514, October 8th, 2009.

¹⁸⁶ White House Press Release, Oct. 5th, 2009, *available at*

http://www.whitehouse.gov/the_press_office/President-Obama-signs-an-Executive-Order-Focused-on-Federal-Leadership-in-Environmental-Energy-and-Economic-Performance.

¹⁸⁷ *Id.*

¹⁸⁸ OECD (2008), *Eco-Innovation Policies in the United States*, Environment Directorate, OECD.

¹⁸⁹ *Id.*

¹⁹⁰ *Sustainable Procurement in Practice*, pg. 6.

¹⁹¹ Oosterhuis, *Energy Efficient Office Appliances*, 2006.

¹⁹² *Available at* <http://www.defra.gov.uk/publications/files/pb11710-procuring-the-future-060607.pdf>, p. 23.

¹⁹³ Edler, p. 132.

¹⁹⁴ *Id.*, p. 149.

¹⁹⁵ *Americans with Disabilities Act*, *available at* <http://www.ada.gov/pubs/adastatute08.htm>.

¹⁹⁶ Fraunhofer, p. 188.

Through specific product-oriented efforts, the United States achieved the development of highly innovative products through the public procurement. Due to large military research and purchasing, these efforts were dominated by the Department of Defense, and a notable example of this is the development of the GPS system.¹⁹⁷ The GPS system consists of 24 satellites acting in coordination to identify the location of a suitable receiver, and was developed by the US Air Force for military use after an investment of over \$10 billion. The system now has widespread civil application however, and has ‘spawned a substantial commercial industry in the United States and abroad with rapidly growing markets for related products and services.’¹⁹⁸ This is an example of the power of the procurement of innovation for government purposes to alter the private market. Efforts are also made at the federal level to enhance the share of small and medium enterprises in procurement awards.¹⁹⁹ Regulations at the state level are more heterogeneous, making it difficult to offer a generalized analysis.²⁰⁰

Public procurement for green innovation

We have been unable to find any specific US policies aimed toward the promotion of green innovation through public procurement. However, there are a number of individual cases in which the federal or state governments have purchased and implemented green innovations. They could again serve as good practices. In the transportation sector, a relevant example is the deployment of zero-emission buses, using innovative hydrogen fuel cell technology, as part of California’s broader environmental agenda. According to the government’s information on these buses:²⁰¹

‘Each ZBus produces zero smog forming pollutants and is estimated to reduce greenhouse gas emissions by 46 percent over a diesel fuelled bus. The Zero-Emission Bus (ZBus) regulation was established in 2000 with the intention of gradually developing a California transit fleet composed of 15 percent zero emission buses. The California Legislature has supported ZBus deployments by allocating \$6.4 Million towards these buses. Current demonstrations are underway throughout the State to validate technology readiness. In total, 19 zero emission buses will soon be in full operation within California transit fleets.’

Green innovation also plays an important role in the energy sector. In 2001, the Federal Energy Management Programme of the U.S. Department of Energy issued a tender on the basis of the ‘Standby Power Devices’ directive issued by the president, for the development of products that require less electricity in stand-by mode²⁰². The tender also included the development of a method to measure the stand-by consumption of devices. The products that achieved the lowest stand-by consumption were recommended by the

¹⁹⁷ Edler, p. 133.

¹⁹⁸ Pace et. al., *The Global Positioning System*, 1995.

¹⁹⁹ Vinnova, *Public Procurement as a Driver for Innovation and Change*, p. 57 (2007).

²⁰⁰ *Id.*, p. 26.

²⁰¹ Available at <http://www.arb.ca.gov/msprog/bus/zeb/zeb.htm>

²⁰² Executive Order 13423, 2001, available at

www.whitehouse.gov/sites/default/files/omb/procurement/green/eo13423_instructions.pdf+’Standby+Power+Devices’+US+procurement&hl=en&gl=ch&pid=bl&srcid=ADGEEsJ_t8yN2TFvVmAfWRWVlWyPf5c8MD5Zpel26PJfwhclJCimjhBkpWHgqK9_63WsP2wk9NCQAoISBprq2eRF_3ehuaMU_r7A7-Z-0ebaftewtNIUZfnBAG-y0igXU9yADS1XAXNm&sig=AHIEtbTMcRyNvYjmfv53BVf90IzuDIE5IA&pli=1.

government for public procurement to state agencies.²⁰³ Furthermore, the US Department of Defense (DoD) is increasingly looking for renewable energy technologies for use on its bases, and has established programmes to help find and develop technologies from the private sector for its use. Following an executive order from President Obama, the DoD is to cut greenhouse gas emissions from its non-combat activities by 34 percent by 2020. The GHG reduction target exempts the aircraft, ships and land vehicles used in combat, but includes the Department's 300,000-plus buildings and 160,000 fleet vehicles. Buildings and vehicles account for about a quarter of the DoD's energy consumption, but nearly 40 percent of its emissions. Increased use of renewable energy sources will play a large part in hitting the emissions reduction target.²⁰⁴

Finally, in 2009, the US government began using public procurement to spur innovation and commercial deployment of advanced carbon capture and storage technologies.²⁰⁵ The project descriptions required the developed technology to be useable on a commercial scale.²⁰⁶ It should therefore 'establish technical feasibility and economic viability' studies, review the 'effectiveness, safety and permanence' of carbon sequestration, achieve a 90 percent carbon capture and sequestration rate, and develop technologies for 'CO2 monitoring, mitigation and verification'.²⁰⁷ After the research for the project was completed, a competitive selection process was launched among various interested communities in Illinois in order to determine the site of the pilot plant.²⁰⁸

It is likely that the US will see a continuation of this trend towards a focus on innovative green technologies in the future. In his 2011 state of the union address, President Obama focused on the role of innovation in achieving a greener economy in the United States.²⁰⁹ It is clear that the government wishes to see this innovation taking place in the United States, and in the same speech the President highlighted the potential of a growing green technology sector. Although few initiatives are in place yet, public procurement for green innovation could begin to play a larger and more explicit role in environmental and economic policies, as these visions are translated into action.

²⁰³ Edler, *Nachfrageorientierte Innovationspolitik in den US*, p. 140.

²⁰⁴ Andrew Charlesworth, *US Department of Defense looks for green innovation*, Business Green (2010).

²⁰⁵ Tender document DoE Funding opportunity announcement 'Restructured FutureGen'. Available at http://fossil.energy.gov/programs/powersystems/futuregen/Restructured_FutureGen_Final_FOA__6-24-0.pdf, p. 6.

²⁰⁶ *Id.*, p. 7.

²⁰⁷ *Id.*, p. 7.

²⁰⁸ Available at <http://www.netl.doe.gov/technologies/coalpower/futuregen/index.html>. Information on specific tender guidelines can be found at:

http://www.futuregenalliance.org/media/FGA_Guidance_100510_Final.pdf

²⁰⁹ Nancy Sutley, *Winning the Clean Energy Future in Communities Across America*, (2011), available at <http://www.whitehouse.gov/blog/2011/03/08/winning-clean-energy-future-communities-across-america>.

4. Japan

Japan has set an ambitious target of reducing greenhouse gas emissions by 25 percent by 2020. The Japanese administration, furthermore, implemented a new Growth Strategy towards 2020.²¹⁰ As Japan has taken a far-reaching approach to green public procurement, it could in the future profit from combining its efforts into a comprehensive strategy for public procurement for green innovation.

Public procurement for green innovation

Green innovation is a relatively new concept in Japan although innovation and environment have long been key elements in Japanese science and technology policy. For example, the Third Basic Plan,²¹¹ adopted in 2006, insisted on the importance of the creation of innovation and of environmental sustainability respectively, but did not mention the relationship between the two. It was in the 'New Growth Strategy (Basic Approach)²¹², adopted in December 2009, that the Japanese government for the first time explicitly referred to green innovation in its official document. Recognizing the importance of green innovation, the New Growth Strategy (Basic Approach) establishes three specific targets by 2020 for green innovation, that is, the creation of new environmental markets of more than 50 trillion yen, the creation of more than 1.4 million jobs, and the reduction of more than 1.3 billion tons of the world greenhouse gas emissions by Japanese technologies. In order to achieve these targets, the New Growth Strategy, adopted in June 2010, proposes the following policies: feed-in tariff; 'environmentally friendly cities of the future'; and reforestation and restoration of forestry.²¹³ The promotion of green innovation is also one of the two primary goals of the Fourth Basic Plan, together with the promotion of life innovation, although the Fourth Basic Plan has not yet been adopted.²¹⁴

Despite the newness of the term green innovation in Japan, the government has already implemented many policies that contribute to green innovation. Such policies include an increase of, and improvement in, competitive research grants; the promotion of the competitiveness of universities; collaboration among industries, government agencies and academia ('industry-government-academia collaboration'). Among other things, grants and subsidies have been the principal tool for green innovation in Japan.

It turns out that public procurement is hardly recognized as a tool to create green innovation. The Third Basic Plan barely mentions that public procurement can create markets for new technologies and spur innovation (both green and non-green

²¹⁰ Available at <http://www.rio.br.emb-japan.go.jp/NewGrowth.pdf>.

²¹¹ The Science and Technology Basic Law [hereinafter the 'S&T Law'] requires the government to periodically publish a 'Basic Plan for the Promotion of Science and Technology' [hereinafter the 'Basic Plan'] to outline 'comprehensive policies with regard to the promotion of S&T'. S&T Law, Arts.3&9. Available at <http://www8.cao.go.jp/cstp/english/law/Law-1995.pdf>. In 2006, the government published the Third Basic Policy which set up science and technology policies for the fiscal years 2006-2010.

²¹² Available at <http://www.kantei.go.jp/jp/kakugikettei/2009/1230sinseichousenryaku.pdf> [Japanese].

²¹³ Available at <http://www.kantei.go.jp/jp/sinseichousenryaku/sinseichou01.pdf> [Japanese].

²¹⁴ In December 2010, a draft of the Fourth Basic Policy was finalized by the Council for Science and Technology Policy for the fiscal years 2011-2016 and scheduled to be adopted by the government in March 2011. However, because of the major earthquake and subsequent nuclear crisis in March, the Council decided to review the draft (especially nuclear policy thereof) and postpone its adoption.

innovation), while other government documents make no or little reference to the role of public procurement in the promotion of green innovation. Nevertheless, Japan has been making efforts to ‘green’ its public procurement policies. That means Japan has introduced ‘green public procurement’ but not ‘public procurement for green innovation’.²¹⁵

Green public procurement

There are two major legal instruments for green public procurement: the ‘Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities’ [hereinafter ‘Green Purchasing Law’]²¹⁶ and the ‘Law Concerning the Promotion of Contracts Considering Reduction of Emissions of Greenhouse Gases and Others by the State and Other Entities’ [hereinafter ‘Green Contract Law’].²¹⁷ While these instruments do not explicitly mention green *innovation*, they require the government and other public entities to consider environmental aspects when buying goods or services or awarding contracts.²¹⁸ The Green Purchasing Law and the Green Contract Law contribute to greening the tendering procedures in the following ways.

First, the Green Purchasing Law, together with the basic policy adopted under the Law,²¹⁹ provides a definition²²⁰ and criteria of ‘eco-friendly goods and services’. As the only of the four countries of study, Japan has thereby defined green procurement in law. The current basic policy²²¹ first sets forth a general rule that ministries and other public entities subject to the Law should take into account ‘the reduction of environmental impact over the entire product lifecycle’. It then presents more detailed criteria for the

²¹⁵ See the Introduction of this paper for the definition of the terms.

²¹⁶ Available at <http://www.env.go.jp/en/laws/policy/green/index.html>.

²¹⁷ Available at <http://www.env.go.jp/en/laws/policy/green/contract.html>.

²¹⁸ Article 3(1) of the Green Purchasing Law requires the government and other public entities to ‘endeavor to choose eco-friendly goods, etc. while giving consideration to the appropriate use of the budget’. Similarly, Article 3 of the Green Contract Law requires the government and other public entities to ‘endeavor to ensure the appropriate and reasonable use of energy in order to reduce emissions of their greenhouse gases and others, and to award contracts in consideration of various factors other than cost, with preference given to contracts which contribute to the reduction of emissions of greenhouse gases and others by the State or relevant independent administrative institution and are also economically efficient’.

²¹⁹ Article 6(1) requires the government to ‘determine the basic policy for the promotion of procurement of eco-friendly goods, etc.’ in order to comprehensively and systematically promote the procurement of eco-friendly goods, etc. In addition, each ministry or public entity subject to the Law ‘shall draw up every fiscal year a policy for the promotion of procurement of eco-friendly goods’ in accordance with the basic policy. Article 7(1).

²²⁰ Article 2(1) of the Green Purchasing Law defines ‘eco-friendly goods, etc.’ as the goods or services which satisfy any one of the following criteria:

- (a) Recycled resources including materials or parts/components which contribute to the reduction of ‘environmental impact’ (as provided in Article 2 (1) of the Basic Environmental Law (Law No. 91, 1993); the same shall apply hereinafter)
- (b) Products which contribute to the reduction of environmental impact on one of the following grounds: - materials or parts/components used in the aforementioned goods contribute to the reduction of environmental impact; - greenhouse gas, etc. emitted as a result of the use of the aforementioned goods do not cause a large environmental impact; - the whole or part of the aforementioned goods can be easily reused or recycled, so that generation of waste can be limited; and – others; and
- (c) Services which contribute to the reduction of environmental impact, for example, services provided by utilizing products that contribute to the reduction of environmental impact.

²²¹ Available at <http://www.env.go.jp/en/laws/policy/green/2.pdf>.

designated product and service categories.²²² Procuring entities that are subject to the Green Purchasing Law shall endeavour to incorporate such criteria in technical specifications of procured goods or services. The effect of such incorporation would be that only those who can supply goods or services meeting the criteria of the basic policy can submit a tender.

Second, the Green Contract Law and the basic policy adopted under the Law²²³ require the government and other public entities to ‘endeavour to’ awards ‘green contracts’.²²⁴ The current basic policy first sets forth a general approach that green contracts should be promoted in a range of fields as wide as possible. It then provides specific methods to be used in the following fields respectively: electricity supply; vehicle purchases and rentals; vessel procurement; Energy Service Company (ESCO); and construction. For example, in electricity supply contracts, only those who meet certain environment-related criteria²²⁵ are qualified to submit a tender, but a successful bidder is chosen based exclusively on price. In vehicle purchase or rental contracts, procuring entities are required to select bidders based not only on prices but also on environmental impacts.²²⁶ In vessel procurement, procuring entities have to award a contract to a supplier with the most advanced technologies including environmental technologies.

According to a government report, the Green Purchasing Law has been successful in reducing greenhouse gas emissions as well as creating and expanding markets for eco-friendly products.²²⁷ It is reported that many of the products subject to the Law have dramatically increased their market shares.²²⁸ One of the most significant successes of the Green Purchasing Law is the development and diffusion of low-emission vehicles. The success can be attributed to the combination of the Green Purchasing Law (public procurement) with other policies, such as the Action Plan for the Development and Diffusion of Low-Emission Vehicles²²⁹; tax exemption and subsidies for transport industries²³⁰; tax exemption for individuals.²³¹

²²² The current basic policy designates the following categories: paper; stationary; office furniture, etc; office automation machines; mobile telephone; home electronic appliances; air conditioners, etc; water heaters, etc; lighting; vehicles, etc; fire extinguishers; uniforms and work clothes; interior fixtures and bedding; work gloves; other fiber products; facilities; disaster prevention supplies; public-works projects; services.

²²³ Article 5 of the Green Contract Law requires the government to ‘formulate a basic policy for the preferment of contracts that address the reduction of emissions of greenhouse gases and others’. The government publishes a brochure on the Law, *available at* http://www.env.go.jp/policy/ga/bp_mat/01whole-02/en_full.pdf

²²⁴ According to the basic policy, green contracts are contracts with lower ‘emissions of greenhouse gases and other substances that negatively impact the environment’.

²²⁵ The criteria include the level of greenhouse gas emissions and the efforts to use renewable energy.

²²⁶ This means that a successful bidder shall be selected based on ‘comprehensive evaluation’ in vehicle purchase or rental tendering.

²²⁷ *Available at* <http://www.env.go.jp/policy/hozen/green/g-law/jisseki/reduce-effect070402.pdf> [Japanese].

²²⁸ Ministry of the Environment, *Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity in Japan*, p. 153, 2010, *available at* <http://www.env.go.jp/en/wpaper/2010/index.html>.

²²⁹ *Available at* http://www.env.go.jp/press/file_view.php?serial=2402&chou_id=2729 [Japanese].

²³⁰ *Available at* http://www.mlit.go.jp/jidosha/jidosha_tk1_000003.html [Japanese].

²³¹ *Available at* http://www.mlit.go.jp/jidosha/jidosha_fr1_000005.html [Japanese].

5. Comparative overview of case studies

It follows from the assessment of the four countries above that public procurement for green innovation is a useful tool, but that it is so far only sporadically pursued, with none of the nations adopting a truly systematic approach.

For the comparison of different national approaches to public procurement for green innovation, their policies in green public procurement and in public procurement of innovation have been assessed. The above demonstrates that Japan has taken the most intensive approach to green public procurement, as it has introduced mandatory criteria that must be respected in order for bidders to participate in the tender process. The Japanese approach appears to have been successful in promoting green innovation, considering the emission reductions and the market expansion for eco-friendly products that the country has achieved. Germany and the UK have taken incentive-based approaches to promoting green innovation and leave it up to public agencies to voluntarily consider green criteria. Through its executive order from 2009, the USA has recently taken an approach that could be interpreted to make the consideration of green criteria in certain public procurement processes mandatory.

With regard to the public procurement of innovation, all assessed countries have, more or less, indicated their intent to consider innovation as a criterion in public tenders. The UK has taken a systematic approach to the use of innovation as a criterion for public procurement. In the other countries, however, public procurement of innovation appears not to be used systematically, but seems to be employed for specific projects in which countries consider it to be particularly desirable. A large transportation technology project, such as development of the Toll Collect system in Germany, for example, appears well suited for the public procurement of innovation. There are also instances, such as the development of the GPS system in the US, in which public procurement of innovation was not specifically designed to promote private demand, but made a successful transition to this market.

The UK appears to be the only country, among the four, that has actively pursued a pre-procurement approach in order to assess the future innovation demand of the market and in order to communicate potential procurers' needs to potential suppliers as well as suppliers' knowledge of potential technological solutions back to procurers. As Edler argues, user-producer interaction and interactive learning is central to the success of an innovation initiative.²³²

The development of the carbon capture and storage (CCS) is an interesting industry to view differences in the countries' approach to green and innovative development. While the UK and the US are using public procurement to successfully compete, while Germany and Japan have both used supply mechanisms (such as R&D finance) to achieve innovation in this case. The procurement schemes of the UK and the US with regard to CCS are quite similar. Both involve tenders with specific criteria for the development of the technology and require the bidder to develop the technology from general research on its feasibility for commercialization. Both the UK and the US scheme demand that the CCS pilot plants for the procurement project are built on their territory. Such a requirement could potentially violate the GPA.

²³² Fraunhofer, p. I.

Overall, the evidence of procurement practices in the four countries of study suggests that green and innovation criteria will be most likely used for particular markets. In many mentioned examples the government targeted the energy sector, especially with an aim to achieve higher energy efficiency and more environmentally friendly energy production processes. Waste management appears to be another market in which green and innovation criteria could be used in procurement processes in the future. It should be noted that the UK government has yet taken a broader sectoral approach to including green development and innovation for public procurement than the other countries, considering both aspects for instance in its purchases of equipment for hospitals, health centres and emergency services.

Table 2: Policy initiatives in place in the countries of study²³³

	UK	Germany	USA	Japan
Green public procurement	Voluntary use, self-assessment review mechanism.	Voluntary use.	Mandatory use, Energy Star labelling.	Mandatory use, technical specifications, guidance.
Public procurement of innovation	Mandatory Innovation Procurement Plan, voluntary guidelines.	Voluntary use, supply-oriented approach.	Voluntary use, sectoral focus of public entities.	Supply-oriented approach.
Public procurement for green innovation	Voluntary use, 'Forward Commitment Procurement' program	Voluntary use, potentially supply-oriented approach.	Voluntary use.	Supply-oriented approach.

²³³ Based on data from the OECD 2010 Survey on Public Procurement, p. 18.

IV. Conclusion

Public procurement is a substantial part of the economies of most modern nations and, as such, is an appealing medium through which to attempt to influence spending, both public and private. Public procurement for green innovation is one such policy that some suggest may offer an opportunity to tailor public intervention in the market to advance one of the most pressing issues of our time.

An analysis of the legal framework of policies in this area indicates that much will depend on the particular characteristics of any given approach, and the agreements to which the nation in question is a signatory. The GPA offers sufficient flexibility to favour green innovation, subject only to constraints of transparency, non-discrimination, and a requirement that policies not favour domestic suppliers (in keeping with the GPA's national treatment requirement). Some exceptions also exist for policies that may not meet these requirements, but may nonetheless be allowable (ex. if excluded from the agreement *ex ante*). The SCM appears more restrictive, requiring objective tender criteria and that the government not engage in subjective selection of private companies and markets for procurement or expansion. This requirement may hinder the ability of the government to engage in specific procurement. Where the product in question is a service, the GATS may also apply, but appears unlikely to present any legal obstacles to the public procurement for green innovation. Finally, regional trade agreements like NAFTA may bear upon these policies and would need to be considered in each case.

The country analyses indicate that there is, at present, no systematic approach to the public procurement for green innovation, though a medley of idiosyncratic approaches does exist. The UK is perhaps closest to having established a national strategy, while Germany, Japan and the US have only pursued such policies where deemed uniquely favourable. Despite lacking a comprehensive strategy, Japan has a considerable number of policies in this area, and has gone so far as to mandate that its agencies must consider criteria related to innovation and environmental impact in their procurement. In comparison, the German approach has been one of voluntary encouragement for federal agencies, and the UK has adopted a voluntary approach together with an incentive scheme to encourage these decisions in public entities. Finally, the US is only now developing its green procurement policy, but has used the public procurement of innovation successfully in the past to develop technologies that have subsequently gained wide private market acceptance and proven a boon for the US market.

This research has sought to examine the practice of public procurement for green innovation, its legal framework and current use by different OECD members. Because of the varying needs and laws of each state, and because opinions on public procurement for green innovation remain somewhat divided, it is not possible to offer either a general recommendation or caution regarding the policy. The intention, instead, has been to present for consideration each of these elements of the policy, which remains an available tool in the repertoire of every state.

V. Selected Bibliography

Anderson, Robert D. Et al., *Public procurement Provisions in Recent Regional Trade Agreements in: The WTO Regime on Public procurement: Challenge and Reform*, Cambridge University Press. 2010.

Arrowsmith, S., J. Linarelli and D. Wallace, *Regulating Public Procurement: National and International Perspectives* (London: Kluwer Law International 2000)

Arrowsmith, S. and M. Trybus (eds.), *Public Procurement: the Continuing Revolution* (London: Kluwer Law International 2002)

Arrowsmith, S. "The EC procurement directives, national procurement policies and better governance: the case for a new approach" (2002) 27 *European Law Review*

Aschhoff B., Sofka, W., *Innovation on demand—Can public procurement drive market success of innovations?* *Research Policy* 38, (2009)

Blind, K, et al., *Innovationsfaktor Staat - Aktiver Promoter und intelligenter Rahmensetzer*, in: Jäkel, Blind (ed.), *Impulskreis Innovationsfaktor Staat in der Initiative "Partner für Innovation"*, *Zwischenbilanz eines Arbeitsjahres*, Band 5.

BMWi, *Bericht zur Innovationsorientierung öffentlicher Beschaffung 2009*, (2009), available at <http://www.bmwi.de/BMWi/Redaktion/PDF/B/bericht-innovationsorientierung-oeffentlicher-beschaffung,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>.

Bouwer M, de Jong K, Jonk M, Berman T, Bersani R, Lusser H, Nissinen A, Parikka K and Szuppinger P, *Green Public Procurement in Europe 2005 - Status overview*, (2005), available at <http://europa.eu.int/comm/environment/gpp/media.htm#state>.

Bozeman, B. 'Public-Value Failure: When Efficient Markets May Not Do', *Public Administration Review*, Vol. 62, No. 2 (2002)

Bourgeois, Dawar, and Evenett (2007). "A Comparative Analysis Of Selected Provisions In Free Trade Agreements." Report prepared for DG Trade European Commission. August 2007.

Buy Smart, 2009: *Procurement and Climate Protection - Guideline for procurement of appliances, lighting, vehicles, and power with criteria of energy efficiency and environment - General Module*, Ekodoma Ltd

Carayannis, 'Profiling a methodology for economic growth and convergence: learning from the EU e-procurement experience for central and eastern European countries', *Technovation*, Jan 2005, Volume: 25 Issue: 1

Cave, Jonathan, Frinking, E, 2003: *Public procurement and R&D: Short analysis of the potential and practices*, In: *Gavigan (2003): Public Procurement and R&D. A JRC/IPTS-ESTO Fast Track Working Paper*. European Commission Joint Research Centre - Institute for prospective technological studies.

Charnovitz, S. *Belgian Family Allowances and the challenge of origin-based discrimination*, *World Trade Review* 4, pp. 7-26 (2005).

Condon, Bradley J. *Climate Change and Unresolved Issues in WTO Law*, 12 *Journal of International Economic Law* 895, (2009).

CSR Europe, Sustainable Public Procurement, 2009, p. 2. Available at: www.csreurope.org/.../20091001_csr_europe_helpdesk_for_epson_sustainable_public_procurement_final.pdf,

Dimitri, N. G. Piga and G. Spagnolo (eds.), Handbook of Procurement (Cambridge: CUP 2006)

Edler, Jakob et al., 2005: Innovation and Public Procurement. Review of Issues at Stake, Study for the European Commission, ENTR/03/24, p. VII. Online at: cordis.europa.eu/innovation-policy/studies/full_study.pdf (accessed: 2 March 2011)

Edler, Jakob, Georghieu, Luke, 2007: Public procurement as one of the key elements of a demand-oriented innovation policy, Research Policy 36 (2007) 949–963

Erdmenger, Christoph, 2003: Buying into the Environment: Experiences, Opportunities and Potential for Eco-procurement, Sheffield, UK: Greenleaf Publishing

European Commission (2008), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan. COM(2008) 397 final

European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, Public procurement for a better environment, (2008), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0400:FIN:EN:PDF>

COWI. European Commission. Directorate General Environment. Bridging the Valley of Death: public support for commercialisation of eco-innovation. Brussels. 2009

Fraunhofer Institute, Innovation and Public Procurement. Study for the European Commission (No ENTR/03/24) (2005)

Geroski, P.A., 1990. Procurement policy as a tool of industrial policy. International Review of Applied Economics 4 (2), S.182–S.198.

Germanwatch, 2010: Klimaverträgliche Öffentliche Beschaffung, online: www.germanwatch.org/klima/pos-kb.pdf

C. Erdmenger (Hrsg.) Buying into the environment. Experiences, opportunities and potential for eco-procurement. Sheffield (Greenleaf) (2003)

Brian Hindley, 'Empty Economics in the Case for Industrial Policy', The World Economy, Volume 10, Issue 3, (2007)

R. Hunja, "Obstacles to Public Procurement Reform in Developing Countries", Ch. 2 in S. Arrowsmith and M. Trybus (eds.), Public Procurement: the Continuing Revolution (London: Kluwer Law International 2002)

Kattel, R. and V. Lember (2010), Public Procurement as an Industrial Policy Tool: An Option for Developing Countries? Journal of Public Procurement, 10(3).

Kunzlik, P. International Procurement Regimes and the Scope for the Inclusion of Environmental Factors in Public Procurement', OECD Journal on Budgeting (2003)

Magat, Wesley A. 'The Effects of Environmental Regulation on Innovation', 43 Law and Contemporary Problems, (1979)

Mavroidis, P., Public procurement Agreement – The Trondheim Case: the Remedies Issue, 48 Swiss Rev. Int'l Econ. Rel. 77 (1933). 306 Vol. 1:299.

Marron, Greener Public Purchasing as an Environmental Policy Instrument, OECD Journal on Budgeting (2003).

McCrudden, C. Using public procurement to achieve social outcomes. Natural Resources Forum 28 (2004) 257–267

McCrudden, C. Buying Social Justice: Equality, Government Procurement, & Legal Change (OUP; 2007)

McAfee, R. Preston, and John McMillan. “Government Procurement and International Trade,” Journal of International Economics, 1990 26: 291-308

Ministry of the Environment, Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity in Japan 2010

National IST Research Directors Forum Working Group on Public Procurement, Pre-Commercial Procurement of Innovation, 2006 available at ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/pcp/precommercial-procurement-of-innovation_en.pdf

Norden, ‘Innovative Green Public Procurement of Construction, IT and Transport Services in Nordic countries’, (2010)

OECD/Eurostat, Oslo Manual, (2005)

OECD, ‘Improving the Environmental Performance of Public Procurement: Issues of Policy Coherence’, Department for Business Enterprise and Regulatory Reform, ‘Regulation and innovation: evidence and policy implications.’ (1997)

OECD, The Environmental Performance of Public Procurement: Issues of Policy Coherence (2003)

C. Parenti. The Big Green Buy: How Government's Purchasing Power Can Drive the Clean-Energy Revolution. The Nation August 2/9, 2010

G. Piga and K. Thai (eds.), Advancing Public Procurement: Practices, Innovation and Knowledge-sharing (Boca Raton: PRAcademics Press 2007)

PricewaterhouseCoopers, Collection of statistical information on Green Public Procurement in the EU: Report on data collection results, PwC Sustainability (2009)

Rothwell, R. (1984), Creating a Regional Innovation-Oriented Infrastructure: The Role of Public Procurement. Annals of Public and Cooperative Economics, 55: 159–172

Rogers, E. M., Diffusion of Innovations. 5. Ed. New York: Free Press. (2003)

Sauvant, K. International investment agreements: key issues. (2004). Online: <http://www.unctad.org/templates/webflyer.asp?docid=5952&intItemID=2095&lang=en>, p.173.

Schooner, Steven L., Desiderata: Objectives for a System of Government Contract Law. Public Procurement Law Review, Vol. 11, Pp. 103, 2002. Available at SSRN: <http://ssrn.com/abstract=304620> or doi:10.2139/ssrn.304620.

Joseph E. Stiglitz, Knowledge as a Global Public Good: At: http://cgt.columbia.edu/files/papers/1999_Knowledge_as_Global_Public_Good_stiglitz.pdf
S&T Law, Art.1. The provisional translation of the S&T Law provided by the government is available below. <http://www8.cao.go.jp/cstp/english/law/Law-1995.pdf>.

V. Tanzi and L. Schuknecht, Public spending in the 20th century A Global perspective, Cambridge University Press (2000). EC DG Internal Market Public Procurement Indicators 2008.

Thomson, Joyce, Jackson, Tim, 2007: Sustainable Procurement in Practice: Lessons from Local Government, Journal of Environmental Planning and Management, Vol. 50, No. 3, 421 – 444, May (2007)

Thomson, 'Sustainable procurement in practice', Journal of Environmental Planning and Management (2007)

UK Government Department for Business Innovations and Skills, 2008: 'Innovation Nation' - Procuring for innovation, innovation for procurement, White Paper, online: http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/i/innovation_percent20procurement_percent20plans.pdf.

U.S. Federal Register, Executive Order 13514, October 8th, (2009)

Vinnova Policy, 'Public Procurement as a Driver for Innovation and Change.' (2007), available at <http://www.vinnova.se/upload/EPiStorePDF/vp-07-03.pdf>.