



# **Review how sustainable procurement guidelines in Australia may enhance the operation and size of C&D waste end markets**

## **Research Report 3**

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**SBEnc P1.75 Creation and Stimulation of End-Markets for Construction and Demolition Waste**

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## **EXECUTIVE SUMMARY**

Sustainable procurement (SP) is a policy instrument that aims to achieve value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment. In the context of C&D waste management, this policy instrument plays an important role guiding government purchasing practices towards the utilisation of construction materials with recycled content which in turn creates and stimulate end market for C&D waste materials. The report aims to provide an understanding of SP guidelines impacting on the operation of C&D waste end markets. This aim was achieved through meeting the following objectives:

- Analyse national and jurisdictional regulation, policies and guidelines that support using SP
- Assess SP regulatory settings and practices in foreign countries,
- Evaluate the impact of SP on the C&D waste management planning and practices
- Identify factors influencing the application of sustainable procurement in the AEC industry

**List of abbreviations**

<b>Abbreviation</b>	<b>Extended word</b>
<b>ABS</b>	Australian Bureau of Statistics
<b>ACT</b>	Australian Capital Territory
<b>AEC</b>	Architecture, Engineering and Construction
<b>C&amp;D waste</b>	Construction and Demolition waste
<b>C&amp;I waste</b>	Commercial and Industrial waste
<b>CE</b>	Circular Economy
<b>CP</b>	Circular Procurement
<b>EPA</b>	Environmental Protection Authority
<b>GDP</b>	Gross Domestic Product
<b>GISA</b>	Green Industries SA
<b>GPP</b>	Green Public Procurement
<b>ISO</b>	International Organization for Standardization
<b>kt</b>	Kilo tonne
<b>MSW</b>	Municipal Solid
<b>Mt</b>	Million tonnes
<b>NSW</b>	New South Wales
<b>NT</b>	Northern Territory
<b>NWP</b>	National Waste Policy
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>Qld</b>	Queensland
<b>RCA</b>	Recycled Concrete Aggregate
<b>SA</b>	South Australia
<b>SP</b>	Sustainable Procurement
<b>SPP</b>	Sustainable Public Procurement
<b>SV</b>	Sustainability Victoria
<b>t</b>	Tonne
<b>Tas</b>	Tasmania
<b>UN</b>	United Nation
<b>UNEP</b>	United Nation Environment Program
<b>Vic</b>	Victoria
<b>WA</b>	Western Australia
<b>WMD</b>	Waste Management Document

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## 1 Introduction

For many years, the single most important indicator in the practice of public purchasing was the economic factor. However, with pressure on natural resources and increased public awareness of adverse effects of human activities on the environment, governments and corporate world have now moved toward more sustainability in the procurement of goods and services. Sustainable Procurement (SP) integrates requirements, specifications and criteria that are compatible with the protection of the environment and the society.

SP is defined by various organisations for different settings and applications. The one that is accepted by the UN, the UK government and the Australasian Procurement and Construction Council (APCC) is: *'A process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment'*<sup>1</sup>. Other terms that also defined concept of SP include Green Public Procurement (GPP), Sustainable Public Procurement (SPP)<sup>2</sup>, Environmental Purchasing (EP), Circular Procurement (CP) and Environmentally Preferable Procurement (EPP). Following table shows the variations of SP and their definitions:

**Table 1.** Variations of SP and their definitions

Concept	Definition	Source
Sustainable sourcing	Managing all aspects of the upstream elements of the supply chain to maximise the triple bottom line which entails the social, economic, and environmental performance.	Pagell and Shevchenko (2014)
Green public procurement	Procuring 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 produced.	Diófási and Valkó (2014)
Circular Procurement	A process that enables the purchasing party to ensure that, at the end of their service life or useful life, products or materials will be re-used effectively in a new cycle, where the products and materials crucially retain their quality and value.  Circular procurement is the process in which a product, a service or a project is purchased according to the principles of a circular economy. In this process the technical aspects of the product are as circular as possible, taking maintenance and return policies at the end of the use period into account, as well as including financial incentives to guarantee circular use	PIANOo (2020)  Van Oppen et al. (2018)
Environmental Purchasing	The inclusion of environmental factors in decisions on the purchase of products and/or services	Australian Government (2003)

<sup>1</sup> Commonwealth of Australia. 2013. Sustainable Procurement Guide, p. 8.

<sup>2</sup> Alhola, L., S-O. Ryding, H. Salmenperu and N.J. Busch Exploiting the Potential of Public Procurement: Opportunities for Circular Economy. *Journal of Industrial Ecology*. 23(1): 96-109.

Environmentally Preferable Procurement	Involves purchasing products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.	NCDENR (2010)
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SP builds on the notions of circular economy and cradle to cradle design that are measured through different tools including lifecycle assessment techniques. This policy approach *'is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance'* (Brammer and Walker, 2011). Several benefits of SP application are identified in previous literature. For instance, Pick (2017)<sup>3</sup> reported benefits such as stimulating the local economy, contributing to the brand of 'Zero Waste' and other sustainability goals and reducing municipal operating costs by selecting durable and reusable materials. In the context of the construction industry, the implementation of SP can provide environmental benefits through usage of recycled construction materials. For instance, it could result in greenhouse gas emissions by reducing energy consumption. A study by Craighill and Powell (1999) estimated that about 80% of all energy required to produce a building is used in the production and transport of materials. In short, the adoption of SP helps to create a demand for recycled materials with minimum environmental footprint including water and energy.

### 1.1 Principles of sustainable procurement

SP schemes are theoretically informed by ten primary principles that aim to increase resource efficiency and improve sustainability when organisations plan for procuring goods and services. As displayed in Figure 1, these principles refer to various aspects of a SP and can guide public and private organisations to develop individual SP policies. Table 5 summarises the function of these principles that are also related to waste management.

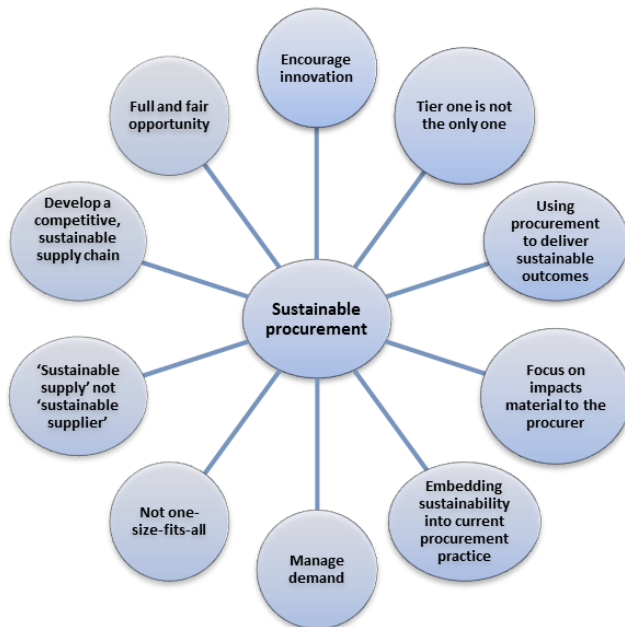


Figure 1. Primary principles of SP

<sup>3</sup> Pick, F. 2017. Waste as a resource: tools for construction and demolition waste management. Metro Vancouver in conjunction with the National Zero Waste Council. Retrieved from <https://bit.ly/2Ob6dvo>

**Table 2.** Functionality of primary principles of sustainable procurement

No	Principle	Description
1	Using procurement to deliver sustainable outcomes	The document should consider procurement as a strategic process and a way of delivering business objectives through a supply chain. The standard needs to set out how sustainability objectives of an organisation are addressed at the early stage of the procurement process through strategic procurement techniques such as market analysis, forward commitment, life cycle assessment, risk management, whole-life costing, scenario modelling, social return on investment and more.
2	Focus on impacts material to the procurer	The sustainability requirements of an organisation need to be clearly defined and materiality understood in consultation with stakeholders. This aligns well with the GRI reporting process. We do not agree that the ISO 26000 principles should be prescribed. They are one (good) example but may not be applicable to all procuring organisations.
3	'Sustainable supply' not 'sustainable supplier'	The focus of the standard should be on sustainable supply, not sustainable supplier. This means using procurement techniques to deliver the outcomes required by the buying organisation's corporate responsibility objectives or policy outcomes for public sector. It should not primarily focus on the sustainability practices of the supplier in their own organisations unless this represents a risk to the purchasing organisation (e.g. labour standards).
4	Not one-size-fits-all	Prioritisation should be of the essence to the standard. Sustainability impacts and risks should be mapped against categories of supply and high priority impacts/categories should be addressed first. This should be followed through a wide range of internal stakeholders, also taking into consideration corporate policy and external stakeholder requirements.
5	Manage demand	Demand management should be key to the standard. The most sustainable way to procure is not to buy at all or to keep demand to a minimum by operating the business more efficiently. There needs to be an organisational link between procurer and user of goods, works and services.
6	Embedding sustainability into current procurement practice	It is important for the standard to address achieving more sustainable outcomes through the current procurement practices of an organisation. It is not telling you to buy better, it should set out how to deliver sustainability through a variety of procurement processes for all sizes and types of organisations.
7	Tier one is not the only one	The standard is not just about the first tier of suppliers. It must reference management of the overall supply chain where there are often significant risks (such as labour standards) or opportunities
8	Encourage innovation	The process should encourage innovation related to more sustainable goods, works and services, through effective market research and use of outcome specifications.
9	Develop a competitive, sustainable supply chain	There should be emphasis on maintaining or improving the competitive market. For example, if a supplier with lower sustainability capacity is selected for other commercial or technical reasons, they should be required to develop a programme of work to improve during the contract. This will improve the pool of competitive suppliers who can deliver sustainable outcomes.

10	Full and fair opportunity	Local procurement, minority businesses, SMEs etc. are often significant stakeholder priorities and should be supported through the supply chain where appropriate. However, this needs to be set in the context of full and fair opportunity and not positive discrimination
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Source: McCarthy (2014)<sup>4</sup>

## 1.2 Sustainable procurement and C&D waste end markets

Environmental and ecological impacts associated with construction activities have become an ever-increasing concern, especially the considerable amount of waste generated on construction sites. The large quantity of waste generated from construction activities denotes that SP will lead to a large environmental impact. SP has the potential to act as a demand-side market force influencing local producers and encouraging the development of sustainable products and practices. SP is regarded as a pivotal market-based instrument that delivers enormous environmental and social benefits that pertain to resource efficiency, controlling operational costs, enhancing compliance with environmental regulations, tackling environmental risks, and creating end markets for C&D waste products<sup>25</sup>. The consideration of SP as part of the tender and contract process ensures a compliance that will benefit the environment, society and economy (Bohari et al., 2017). As a policy instrument, SP generally creates a greater demand for recycled products and as a result, the C&D waste recycled market evolution can be used as an indirect indicator of the success of SP. policy implementation.

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<sup>4</sup> McCarthy, S. 2014. The 10 primary principles of sustainable procurement. Supply Chain Minded. <https://bit.ly/3eXpSKP>

<sup>5</sup> Ershadi, M., Jefferies, M., Davis, P. and Mojtahedi, M., 2021. Achieving Sustainable Procurement in Construction Projects: The Pivotal Role of a Project Management Office. *Construction Economics and Building*, 21(1): 45-64.

## **2 Methodology**

This section characterises the methodology used to achieve the project objectives including data collection process and limitations thereof.

### **2.1 Scope, aim and objectives**

This report focuses on the use of SP strategy to increase the use of recycled C&D waste resources in Australia. The research aim was to provide an understanding of SP guidelines impacting on the operation of C&D waste end markets. This aim was achieved through meeting the following objectives:

- Analyse national and jurisdictional regulation, policies and guidelines that support using SP
- Assess SP regulatory settings and practices in foreign countries,
- Evaluate the impact of SP on the C&D waste management planning and practices
- Identify factors influencing the application of sustainable procurement in the AEC industry

### **2.2 Data collection**

In this study both qualitative and quantitative data were extracted from various literature. The data sources included policies, regulations, guidelines, industry and government reports and scientific publications. Literature review and policy analysis were employed to provide an understanding of SP policies and practices. For policy analysis, the most current versions of SP guidelines were reviewed and analysed. The literature review was conducted to capture the performance of SP in Australia and overseas.

### **2.3 Limitations**

In Australia, the use of recycled C&D waste products through SP guidelines was introduced just recently and its practical application does not have a long history. Therefore, it is expected that there would be little evidence demonstrating its suitability in the Australian context with regards to C&D waste end markets operation and size. This study, however, sought to understand how this waste management strategy impacts overseas C&D waste end-markets.

### 3 Factors influencing successful application of sustainable procurement in the AEC industry

#### 3.1 Barriers

Barriers play an important role in moulding SP practices and the variation in the outcome of SP. Literature has provided various sets of factors that hinder promotion and application of SP initiatives. The nature of issues is heavily context-specific while there could be similarities among different contexts. A research on UN's SP policies and practices developed an eight fold barrier framework (Hasselbalch et al., 2015) in which a number of factors impeding SP are clustered. The framework's major categories include information, tools, policy (strategy), performance measurement, mandate, supply, demand, resources. Table 3 provides a summary of studies investigated SP barriers and enablers both in developed and developing nations.

**Table 3.** Summary of factors assumed a barrier to promote the application of SP in the AEC industry.

PS barriers		
Reference	Context of study	Summary of findings
Da Costa and Da Motta (2019)	Brazil- public sector procurement experts	The study listed five top barriers as (1) lack of long-term planning, and (2) higher costs/prices resulting from the option for sustainable items, (3) lack of methods to measure sustainability, and (4) lack of knowledge about the social and environmental impacts of sustainable products, (5) lack of procurers and suppliers training and education to adopt SP (6) lack of organizational culture to support SP and (7) lack of government incentives
Adell and Schaeffe (2019)	South Korea- construction industry	Barriers include (1) certain materials should be procured from local suppliers to ensure that material quality is maintained, and minimum delivery costs are charged (2) not all materials required for the various types and models of building and constructions are not available on the market. And (4) mistrust of quality, as well as preference for local products by local governments.
Delmonico et al. (2018)	Brazil- Organisations that were part of a government program	Top five clusters of barriers included organisational culture, motivation, economic uncertainty, market, and operations. Amongst these, it was found that organisational culture stands out as a particular barrier to sustainable public procurement.
Hasselbalch et al. (2015)	UN	The interview responses indicated that five major SP barriers towards the implementation of UNEP are (1) the lack of an organizational SP policy, (2) lack of mandatory imposition of SP, (3) short-term cost increases, (4) market barriers and (5) old-fashioned procurement procedures
McMurray et al. (2014)	Malaysia- different organisations	The study findings show that (1) the lack of guidance and awareness for SP, (2) shortage of relevant resources, (3) lack of long-term view and (4) political support are the barriers to SP engagement
United Nations Environmental Programme (2016)	Worldwide	Barriers to sustainable procurements are habit and the difficulty in changing procurement behaviour; lack of suppliers of sustainable assets, suppliers, or services; complexity of comparing costing/ value for money assessments; the difficulty of including factors broader than

		environmental considerations; and a perception that the process and outcomes are costlier or time-consuming.
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### 3.2 Enablers

Procurement experts argue that any planning for sustainable procurement is dependent on accomplishment of a series of conditions which are largely context specific. As presented in Table 4, previous studies have specified various enablers towards the successful application of SP mainly in public sector in New Zealand, Nigeria, Saudi Arabia, and South Africa.

**Table 4.** Summary of factors assumed enabling the promotion SP in the AEC industry.

<b>PS enablers</b>		
Sajjad et al. (2020)	New Zealand-different companies	The study found that customer expectation/pressure and corporate reputation are the main drivers to apply sustainability considerations in procurement management of NZ companies.
Ogunsanya et al. (2019)	Nigeria-construction industry	Study proposes some strategies to minimise the challenges of SP application, which included improving sustainability knowledge among project stakeholders, ensuring transparency and good governance, adapting procurement laws with sustainability clauses and construction industry development.
Zhu et al. (2013)	China-Government officials	Study suggested that regulations, rewards & incentive gains, and stakeholders exert pressure to motivate adoption of GPP practices
Islam et al. (2017)	Saudi Arabia-public and private organisations	The research suggests that attitudes of top management as well as the cultural aspects of the organisations pose the main barriers to effectively implementing sustainable procurement practices at the organisational levels
Gounden (2016)	South Africa-public and private organisations	Sustainable procurement in the public sector is influenced by clear policy, strong technical expertise, strategic partnership and the potential to export locally manufactured goods.

## 4 Review on exiting sustainable procurement guidelines in Australia

Policies and strategies for SP developed by different entities are based on the need to future proof themselves primarily around scarcity in supply and ability to cope with the demand of emerging markets, pressures brought upon by cost and ability to reduce this through reductions in energy consumption and waste reduction<sup>6</sup>. SP should be considered an administrative policy tool. Administrative policy tools can be implemented by command-and-control approaches. However, administrative policy tools such as SP are usually not cost-effective since among other things the procuring entity does not have complete information on all potential supplier and all available production technologies<sup>7</sup>. In this section SP guidelines and policies that drive Australian procurement practices are reviewed.

### 4.1 National guidelines and policies

Noting environmental impacts of government procurements have been emphasised through various policies and guidelines. For instance, reuse of recycled materials is strongly encouraged under Ecologically Sustainable Development (ESD) and SP programs. The first policy on SP, was published by the Australian Government in 2003, under the label of Environmental Purchasing Guideline. This guideline sets the priority areas for government agencies to consider environmental impacts of their procurement activities. However, the guideline does not present any strategy to procure recycled C&D waste.

National Waste Policy 2018<sup>8</sup> sets a target to reduce waste generation through prevention, reduction, recycling, and reuse. This policy has also emphasised the application of the principles of a circular economy to support better and repeated use of our resources. Two strategies to promote sustainable procurement in Australia are at the forefront of this policy: Strategy 8 (Sustainable Procurement by Governments) and Strategy 9 (Sustainable Procurement by Business and Individuals). These two strategies urge the public and private sectors to promote demand for recycled materials and products containing recycled content. Table 5 lists Australian guidelines and policies that drive SP nationally.

**Table 5.** Sustainable procurement in national guidelines and policies

Guideline policy	Issuing organisation	C&D waste-related content
2020 Sustainable procurement Guide <sup>8</sup>	Australian Government - Department of Agriculture, Water, and the Environment	Strategy 8 (Sustainable Procurement by Governments) and Strategy 9 (Sustainable Procurement by Business and Individuals)
2019 National Waste Policy Action Plan <sup>9</sup>	Australian Government	Under Target 4 of the National Waste Policy Action Plan all levels of government and industry have committed to significantly increase their use of recycled content
National Waste Policy 2018 <sup>10</sup>	Australian Government	The Australian Government has committed to consider environmental sustainability when purchasing goods and services
Environment Protection and	Australian Government	Australian Government agencies to include information about their

<sup>6</sup> Ecovadis. 2020. Sustainable procurement. <https://bit.ly/3ynZwct>

<sup>7</sup> Korkmaz, A. 2016. Sustainable and Green Procurement – Part IV. <https://bit.ly/2SXQW3L>

<sup>8</sup> Australian Government.2020. Sustainable Procurement Guide: A practical guide for Commonwealth entities. <https://bit.ly/3ynJntP>

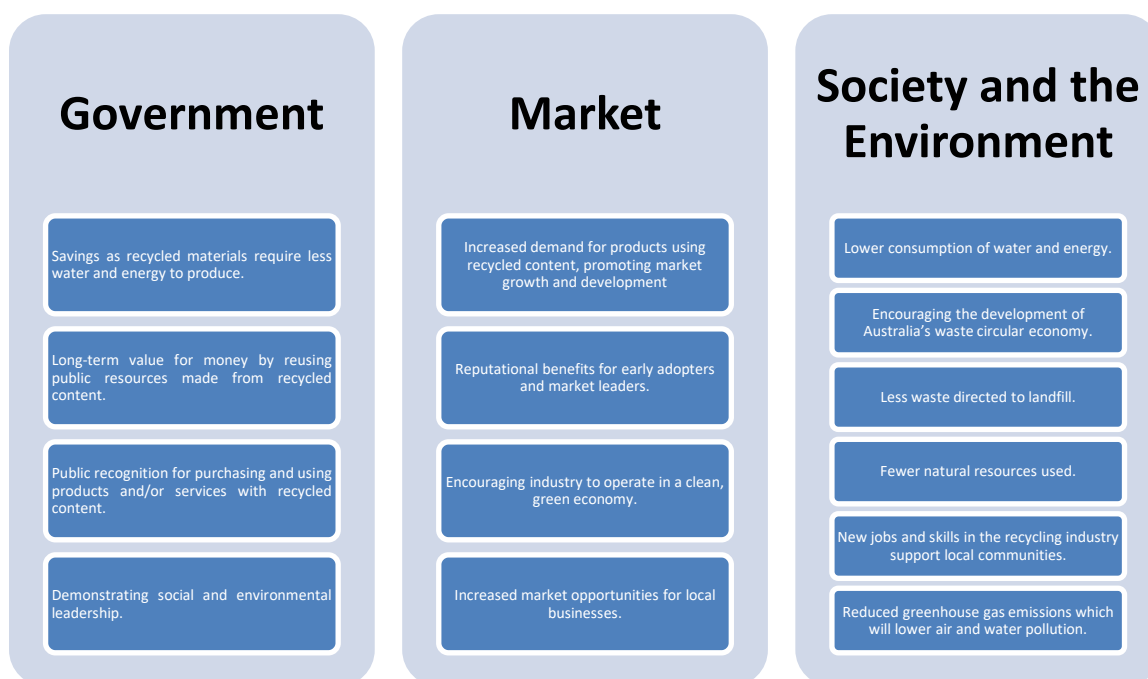
<sup>9</sup> National Waste Policy Action Plan. 2019. Australian Government. <https://bit.ly/3bD6g3W>

<sup>10</sup> National Waste Policy. 2018. Australian Government <https://bit.ly/3v3NQcX>

Biodiversity Conservation Act 1999 <sup>11</sup>		performance on Ecologically Sustainable Development (ESD) principles in their Annual Reports.
Environmental Purchasing Guide 2003	Australian Government	EP can achieve several benefits such as reduce waste (which can reduce waste disposal costs)

The government through 2019 National Waste Policy Action Plan<sup>9</sup> define a number of key action areas to deliver against the targets including advice on governments purchasing power to increase recycling. The Action Plan assume that SP can stimulate demand for recycled materials relative to virgin materials, encourage innovation and investment in recycling to meet demand from new markets, support domestic jobs and industries by retaining the value of recycled materials, and encourage economy-wide behaviour change.

Following the 2010 version of Sustainable Procurement Guideline, the Australian government published a new Sustainable Procurement Guide in 2020<sup>8</sup>. This document provides a framework for the Australian Government to build on efforts to improve sustainability outcomes and mainstream sustainability principles in future procurement. This document provides a list of benefits to purchaser (government), market, and society and the environment that are achieved through buying recycled content.



**Figure 2.** The perceived benefits of SP by government, market, society and environment.

In 2013, the federal government issued a SP report<sup>12</sup> giving an overview of Australian Government procurement policies and operational activities that embody sustainable procurement principles and practices in 2010–11 and 2011–12. In addition to each of the policies and guidelines tabulated above,

<sup>11</sup> Australian Government. Environment Protection and Biodiversity Conservation Act 1999. <https://bit.ly/3c0vhPO>

<sup>12</sup> Australian Government. 2013. Sustainable Procurement in the Australian Government Report 2013. <https://bit.ly/3v5NjgL>

each government department internal policies that encourage conscious procurement involving themes such as resource efficiency and use of recycled products.

## 4.2 Jurisdictional guidelines and policies

Among the Australian states and territory governments, only ACT, NSW, SA and WA developed a SP guideline. Each of these guidelines are underpinned by several other jurisdictions regulations and policies. For instance, Sustainable Procurement Guide: for local government in NSW<sup>13</sup> originates in Local Government ACT 1993 (NSW), Local Government (General) Regulation 2005 (NSW), NSW Procurement Policy Framework for NSW Government Agencies, Tendering Guidelines for NSW Government 2009, and Local Council’s Policies and Vision Statements. Furthermore, procurement of recycled C&D waste materials should be in compliance with material specifications developed and administrated by public agencies in each state/territory. Among the jurisdictional polices, Victorian Recycled First Policy 2021 is the most relevant driver to use recycled C&D waste products.

**Table 6.** Sustainable procurement in state and territory guidelines and policies

State / territory	Guideline policy	Issuing organisation	C&D waste-related content
ACT	Sustainable Procurement Policy 2015 <sup>14</sup>	ACT Government	The policy advises that waste should be looked at as a resource opportunity where products can be re-introduced into another product lifecycle.
NSW	Sustainable Procurement Guide: for local government in NSW <sup>13</sup>	Local Government NSW	Provide general advice on how to sustainably procure goods and services
SA	SA Sustainable Procurement Guideline <sup>15</sup>	SA state government	Urges the state procurement experts to consider both the end of life disposal of assets and also the waste produced by these products and services throughout their life;
VIC	Social Procurement Framework Recycled First	Vic Government	<u>Social Procurement Framework:</u> this framework incorporates sustainable procurement practices. It includes requirements as relevant on recycled content, waste management and energy consumption for (government agencies) buyers.  <u>Recycled First policy:</u> The policy outlines that all bidders on major transport projects will be required to demonstrate how they will optimise the use of recycled or reused Victorian materials. The policy will provide government with data on recycled materials for a better understanding of the supply chain.
WA	Guide to Sustainable Procurement 2017	Department of Finance	Seeking to reduce waste and by-products (e.g. waste avoidance, reuse, use of recycled

<sup>13</sup> Local Government NSW.2021. Sustainable Procurement Guide: for local government in NSW. <https://bit.ly/34tPmJs>

<sup>14</sup> ACT Government. 2015. Sustainable Procurement Policy 2015. <https://bit.ly/3vx4GAT>

<sup>15</sup> SA state Government. 2012. SA Sustainable Procurement Guideline <https://bit.ly/3fqFGFX>

			products or products with recycled content, recycling and resource recovery).
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### 4.3 Sustainable procurement in state/territory waste strategy documents

SP has a key role in waste management of Australian jurisdictions as stipulated in state and territory waste management documents (WMD). This section analyses these documents to provide an understanding of each state and territory government's position on the implementation of SP in relation to waste management and creation and development of end markets. Table 7 provides a summary of statements pertaining to consideration of SP in waste strategies which lead to creation of demand and market development. Among the state and territories Vic and Tas do not have a current WMD. Tas, instead, issued a Draft Waste Action Plan in 2019 to guide waste management practices across the state; however, it does not make any reference to the impact of SP on waste management. ACT, Qld and WA's WMD have rather greater emphasis on the role of SP in market development and waste management overall.

**Table 7.** SP in state and territory waste strategy documents

State / territory	Guideline policy	SP, waste management and market development
ACT	ACT Waste Management Strategy 2011-2025	<ul style="list-style-type: none"> <li>• Government procurement is recommended as a strategy (2.6) to fully recover resources.</li> <li>• The ACT Government can use SP principles to provide a market driver for increased use of recycled materials in the goods and works that it procures. It can also encourage service suppliers to use recycled products where practical.</li> <li>• The ACT Government will review the specifications used for government tendering to identify where recyclable alternatives can replace non-recyclable materials, for example in the tendering of construction and landscaping projects.</li> <li>• As part of its proposed Carbon Neutral ACT Government Framework, the ACT Government will pursue additional SP practices</li> </ul>
NT	Waste Management Strategy for the Northern Territory 2015-2022	No mention of SP
NSW	NSW Waste Avoidance and Resource Recovery Strategy 2014-21	<ul style="list-style-type: none"> <li>• The document assumes responsibilities for deliver WARR Strategy applicable to all government agencies through complementary policies and programs including sustainable procurement</li> </ul>
QLQ	Waste Management and Resource Recovery Strategy	<ul style="list-style-type: none"> <li>• Under Strategic priority 3 (building economic opportunity) one government action is to consider how procurement can stimulate demand for recycled material manufactured in Queensland.</li> <li>• The Queensland Government will work with local government and the waste management and resource recovery sector to develop a consistent procurement contract framework for waste management and resource recovery services</li> </ul>

		<ul style="list-style-type: none"> <li>Local governments should support the Queensland Government through adopting national or state standards for recycled content in procurement, to help stimulate demand for products containing recycled materials.</li> </ul>
SA	South Australia Waste Strategy 2015-20	<ul style="list-style-type: none"> <li>Procurement policies and practices that support the use of re-manufactured products is a key area where all levels of government can directly influence growth in the re-manufacturing sector</li> <li>Long-term strategic objectives: Increase procurement by all levels of government of re-manufactured products.</li> <li>Government procurement should facilitate and stimulate market development and acceptance of outputs from EfW</li> </ul>
TAS	Draft Waste Action Plan 2019	<ul style="list-style-type: none"> <li>Boost demand for recycled products through adoption of sustainable procurement practices across State and local government.</li> </ul>
VIC	NA	NA
WA	Waste Avoidance and Resource Recovery Strategy 2030	<ul style="list-style-type: none"> <li>The document places an increased focus on promoting procurement decisions that preference local markets and play a role in supporting the development of a remanufacturing industry within Western Australia</li> <li>Local, State and Commonwealth governments can influence, educate and inform – and can also be significant consumers whose purchasing decisions and procurement policies can have very positive impacts and influence. They have important legislative and regulatory roles and develop and implement strategies. Australia is also part of global action on waste management.</li> <li>Headline strategy: Implement sustainable government procurement practices that encourage greater use of recycled products and support local market development.</li> </ul>

#### 4.4 Sustainable procurement initiatives

Australia has begun its journey to identify suppliers of recycled C&D waste products with the aim of helping government to identify SP opportunities in their purchases. The following are some examples of SP initiatives that are currently operational across Australia.

**Buy Recycled:** 2020 Sustainability Victoria launched an online directory (Buy Recycled) that will feature local, Victorian products containing recycled content. The directory will help the Victoria government source recycled materials. It will be used by state and local government procurers and buyers to help them easily research, review, and access recycled content products. The five requirements for suppliers are:

- Products must have some amount of recycled content.
- Recycled content use must be greater than 0%, but otherwise there is no minimum recycled content requirement.
- Be certified against any claims made. For example, a third-party Environmental Product Declaration (EPD).
- Meet all legislative and regulatory requirements.
- Meet obligations regarding environmental claims under the ACCC Competition and Consumer Act 2010

- Any claims must meet the ACCC Green marketing and the Australian Consumer Law guidelines

**ASPIRE:** Another initiative launched by Advisory System for Processing, Innovation and Resource Exchange (ASPIRE) intelligently matches businesses with potential purchasers or recyclers of waste by-products. ASPIRE was developed by CSIRO under the State Government of Victoria's Digital Futures Fund in partnership with several Victorian councils; its operation officially kicked off as of 2018. This system requires patrons to enter details about the type and quantity of their exchangeable inputs and waste materials (outputs). Using this data, ASPIRE's Supply Chain Options Model determines optimal sources and destinations for the materials, including options for aggregation with other local businesses, appropriate investment opportunities such as compactors for low- density wastes, and local recyclers. ASPIRE is deployed using existing established council and manufacturing business networks and supports local government business sustainability programs. It captures and codifies SME material inputs, outputs (waste and by-products) and processes and has a powerful optimisation model that takes this data and provides an SME user with three things: (a) suggested B2B resource matches, both substitute inputs or sources and output destinations (b) personalised search results to support the suggested matches and (c) case studies for related resource matches.

**Ecologiq program:** Ecologiq is a Victorian Government initiative to optimise the use of local recycled and reused materials in government infrastructure projects, reduce waste and contribute to a Victorian circular economy. Ecologiq supports the objectives of Recycling Victoria – the Victorian Government's 10-year plan to overhaul the state's recycling sector, keep waste out of landfill and drive innovation in sustainability. Also, Ecologiq has developed recycled material reference guides for road and rail specific applications, as well as ancillary infrastructure. The guides are an ideal starting point for information about different types of recycled materials available in Victoria and the current specifications for their use.

## 5 Government agencies involved in sustainable procurement

As indicated earlier, government agencies are the main actors in the promotion and application of SP space. Ideally, all public agencies should contribute to operationalise this policy instrument. However, depending on jurisdictional regulatory setting, some agencies have more responsibilities to facilitate SP than others. In this section the main public agencies with clear direct statutory responsibility were identified and presented in Table 8.

**Table 8.** State and territory organisations with responsibility of SP implementation and promotion

State / territory	Organisation	Webpage
ACT	The ACT Government	<a href="https://www.procurement.act.gov.au/">https://www.procurement.act.gov.au/</a>
NT	NT Government	<a href="https://nt.gov.au/industry/procurement">https://nt.gov.au/industry/procurement</a>
NSW	NSW Government Local Government NSW	<a href="https://buy.nsw.gov.au/">https://buy.nsw.gov.au/</a>
QLD	Qld Government	<a href="https://www.forgov.qld.gov.au/">https://www.forgov.qld.gov.au/</a>
SA	State Procurement Board Green Industries	<a href="https://spb.sa.gov.au/content/policies-guides">https://spb.sa.gov.au/content/policies-guides</a>
TAS	Tas Government	<a href="https://www.purchasing.tas.gov.au/">https://www.purchasing.tas.gov.au/</a>
VIC	Vic Government Procurement Boards, Sustainability Vitoria, VicRoads	<a href="https://www.buyingfor.vic.gov.au/">https://www.buyingfor.vic.gov.au/</a>
WA	Waste Authority WA Main Roads Department of Finance Western Australian Local Government Association.	<a href="https://www.wa.gov.au/organisation/department-of-finance/procurement">https://www.wa.gov.au/organisation/department-of-finance/procurement</a>

## 6 Review of existing standards and guidelines overseas

### 6.1 International

In 2007, the UN Secretary General made commitment to a sustainable UN. Since after, several initiatives took place to establish a fledgling policy framework for SP. A Sustainable UN (SUN) unit was created in the UN Environment Program (UNEP) to coordinate the sustainability performance of the agencies. Also, an Interagency Working Group on Sustainability Management was formed to track GHG and report to the Environment Management Group (EMG), a UN system-wide coordination body hosted by UNEP. UNEP, the Inter-national Labour Organization (ILO) and the International Training Centre of ILO (ITC ILO) published a manual in 2011 on sustainable procurement for managers and practitioners titled “Buying for a Better World.

ISO 20400<sup>16</sup> fundamentals are designed to guide an organisation in understanding the context and the drivers for an organisation and to establish an aligned sustainable procurement strategy then Action Sustainability’s Shaun McCarthy (one of the contributing organisations in the development of ISO 20400) commented “Societal expectations are at an all-time high. It is no longer acceptable to do a few sustainability things in your organisation and ignore your supply chain. This standard can be a game changer if implemented the way it was designed to be used’ (McCarthy 2017). Table 9 presents the main SP guidelines with universal applicability.

**Table 9.** International guidelines for sustainable procurement

Organisation	Guideline	Aim and objectives
ISO	ISO 20400 <sup>16</sup>	It provides guidelines for integrating sustainability into an organization’s procurement processes. It covers various stages of the procurement process, outlining the steps required to integrate social responsibility into the purchasing function.
ISO	ISO 14001 Environmental Management	It major focus is on the structure, implementation and maintenance of a formal environmental management system
UNEP	Buying for a Better World; A Guide on Sustainable Procurement for the UN System	It aims to (1) concrete and valid arguments for the UN to engage in SP, (2) provide recommendations on the development of a SP Action Plan, (3) develop guidance on the integration of sustainable development principles in the UN procurement cycle.
BREEAM (2018)	BREEAM NC 2018	Refers extensively to sustainable procurement and incorporates ISO 20400 as the recommended sustainable procurement strategy (through providing additional credits where ISO 20400 has been adopted)

<sup>16</sup>ISO 20400. 2017. Sustainable Procurement -guidance. <https://bit.ly/3xLIBQQ>

## 6.2 European Union

SP represents, approximately, 16% of the gross domestic product (GDP) of the European Union (EU), and between 8% and 25% of the GDP in organization for economic cooperation and development (OECD) countries, granting the public sector a high purchasing power<sup>17</sup>. In France, the French government incorporated green public procurement into its Energy Transition for Green Growth Act 201518 to targeting the demand for recycled C&D waste products, put a strong pressure on road construction by requiring 60% of recycled aggregates used in road works in 2020.

## 6.3 UK

UK's Sustainable Procurement Policy<sup>19</sup> is the major SP driver that specifies how the supplier performs the contract in accordance with an environmental policy that aims to conserve energy, water, wood, paper and other resources, reduce waste.

## 6.4 USA

The EPP Program's work has generated significant cost and environmental benefits to the federal government. In 2018 alone, the federal government purchased nearly 7 million EPEAT-registered products, resulting in a cost savings to the federal government of around \$182.5 million<sup>20</sup>.

## 6.5 China

China has become one of the global leaders in public procurement. In 2011, the total amount of public procurement was over \$762.5 billion US dollars including administrative expenditures, education, health, public housing, transportation, and energy<sup>21</sup>. As a result, even in a recessionary period, rapid economic growth and industrialisation has made GPP critical in China's development. In China, the SP is implemented in the form of GPP program since 2004; however, the literature reported that factors such as unclear regulatory requirements, costs associated with GPP implementation and procurement professionals' low awareness of GPP benefits hinder GPP expansion<sup>21,22,23</sup>.

## 6.6 South Korea

During recent years, some additional sector-specific, SP-related policies have promoted the procurement of recycled and Korea Eco-label products, particularly in the construction sector<sup>24</sup>. In 2005, the Construction Waste Recycling Promotion Act introduced the requirement of using recycled aggregates certified either by the Korea Eco-label or the Green Recycled Mark when awarding contracts for road construction works. The 2013 Green Architecture Support Act indirectly promotes construction materials with the Korea Eco-label or Green Recycled Mark, as they are included as criteria in the Republic of Korea's green building certification, the G-SEED certification, which is mandatory for public buildings larger than 3,000 square meters.

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<sup>17</sup> Da Costa, B.B. and Da Motta, A.L.T., 2019. Key factors hindering sustainable procurement in the Brazilian public sector: a Delphi study. *International Journal of Sustainable Development and Planning*, 14(2), pp.152-171.

<sup>18</sup> Doris Nicklaus, Kochert T. 2015. Country profile —France: 2015 review of material resource efficiency policies in Europe— France. European Environment Agency

<sup>19</sup> House of Parliament. 2017. Sustainable Procurement Policy. <https://bit.ly/3vAcDpg>

<sup>20</sup> EPA. 2021. Sustainable Marketplace: Greener Products and Services. <https://bit.ly/34nXVFO>

<sup>21</sup> Zhu, Q., Geng, Y. and Sarkis, J., 2013. Motivating green public procurement in China: An individual level perspective. *Journal of Environmental Management*, 126, pp.85-95.

<sup>22</sup> Geng, Y. and Doberstein, B., 2008. Greening government procurement in developing countries: Building capacity in China. *Journal of Environmental Management*, 88(4), pp.932-938.

<sup>23</sup> Wang, C.H., Qiao, Y.H., Li, W.G. and Comm, E.B.M.O., 2011. On challenges of policy implementation in China green public procurement. In *International Conference on Engineering and Business Management*. 1064-1068.

<sup>24</sup> UNEP 2019. Enhancing the uptake and impact of corporate sustainability reporting. <https://bit.ly/2RyZoX1>

The Korea Eco-label Programme developed by Ministry of Environment in 1994 was initiated with four selected product groups. GPP was introduced in the Republic of Korea under the 1994 Act on Development and Support of Environmental Technology, recommending the preferential purchase of products with the Korea Eco-label or Good Recycled Mark certification to public institutions. The 2005 Act on Promotion of Purchase of Green Products serves as the basis for the implementation of GPP, voluntary agreements on green business procurement and green store certification, among others.

## **6.7 Japan**

Japan is a leading country in SPP has a long history of developing regulations that support implementation of SP. For the first time in 2001 a law on green purchasing was that urged all government agencies to develop and implement SP. In the AEC context, Construction Material Recycling Law<sup>25</sup> enacted in 2000, aiming at recycling and reuse of prospected construction materials in view of ensuring efficient use of resources.

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<sup>25</sup>Ministry of the Environment. 2000. Construction Material Recycling Law. <https://bit.ly/2Qr3eRk>

## 7 Review on studies investigating sustainable procurement

In this section, the literature that documents the implementation of SP in the construction industry is reviewed. The section captures the results of studies that investigate SP related practices and planning both in Australia and overseas. In total, 34 studies were reviewed and their results are provided below.

### 7.1 Australian literature

In 2011, one of the first reports highlighting the role of SP in the market development for recycled C&D waste (Hyder Consulting Pty Ltd, 2011) recommended that public organisations should favour procurement of material containing recycled C&D content where they meet defined performance criteria/specifications. In the Australian construction industry, one of the issues regarding the application of SP of recycled products is the higher total costs of properties built with environmentally sustainable materials. In Australia, the cost of housing is an important element to consumers, especially for the lowest- to middle-income earners. Homebuyers deem that the high cost of environmentally sustainable products pushes up the cost of properties, and that discourages capital investment in such products (Thomas et al., 2013). It projected that this cost should reduce in future as accessibility to building techniques and materials becomes easier (Park and Tucker, 2017).

It is reported that *Sustainable Procurement 2006*, from the Australian and New Zealand Government Framework, has influenced the policies of lower levels of government.

### 7.2 International literature

In a broader context, the literature indicates that government environmental regulations and policies are an important motivator in the adoption of sustainable practices. However, the implementation of sustainable procurement is poorly investigated in the construction industry in literature worldwide. The literature on SP originates in sustainable supply-chain management with a focus on recycling, cost reduction, and minimization of waste (Roman, 2017). There are multiple research studies that support the implementation of sustainable procurement without showing the evidence of its effectiveness in the construction industry (Tan et al., 2011, Aboginije et al.). Below is the review of literature in which the use of sustainable procurement schemes is documented in different countries.

In 2011, a study that investigated the **worldwide** implementation of SP (Brammer and Walker, 2011) among 25 countries reported that requesting supplier to commit to waste reduction goals are among the five main functionality of SP in the sample size.

A study in **Netherlands** on strategies to improve concrete recycling reported the main approach to stimulate concrete recycling is sustainable procurement (Zhang et al., 2020). The government has developed a set of criteria that guide public authorities to implement procurement practices for construction materials including the *Criteria for the Sustainable Public Procurement of Demolition of Buildings*, outlining the minimum requirements for demolition and solid waste breaking-up processes. The *Criteria for the sustainable procurement of Construction Works* addresses the use of secondary materials as a point for reference at the preparatory stage of the procurement process. An earlier study in this country reported that the use of SP by public procurement professionals varied in various years ranging from 2004 to 2007 (Prenen, 2008).

In **Canada**, an industry report from 2011 indicated that many municipalities across Canada have begun constructing SP policies (Reeve Consulting, 2011). However, it is found that the execution has not kept pace with planning primarily due to the limited resources available to SP programs (Pick, 2017). Another study revealed that the lack of funding is the main challenge for implementing SP in the Canadian construction industry (Ruparathna and Hewage, 2015). Other challenges as identified by Pick (2017) include the complexity of construction projects involving several stakeholders, financial and

political pressures forcing rapid completion of construction projects that in turn reduces the procurement team's ability to fully assess environmental benefits, a glut of recycled materials, a misconception by producers about the significance of the price over procurement sustainability criteria. The results of a survey with the staff of multiple municipalities in Canada showed that the lack of trust in the recycled waste quality, a desire to diversify the construction contractors, and the lack of inclusion of recycled materials in construction specification documents (Pick, 2017). The literature suggests that the leadership and commitment of the project owners is the key to fully establish SP in the Canadian construction industry.

In **Finland**, the sustainable procurement target for construction industry is 29%<sup>26</sup>.

In **France**, one study<sup>27</sup> argued that in the short run, limiting the level of RCA in concrete applications in buildings to 10% would probably reinforce the effectiveness of SP and would play a major role in launching the market for recycled concrete and to send a credible signal to the market. The author inferred that, requiring 10% RCA in construction projects would minimise culture resistances and enable improve the clients' confidence in the use of RCA in structural applications. Secondly such a rate would be accepted for most environments and intermediate storage of RCA would not be necessary. Thus, additional costs would be limited. Other findings in this study included realization of this fact that recycling plants have no incentive to invest in crushing equipment and to develop RCA for concrete constructions since the demand of road works is large enough. By creating a critical mass of demand for recycled aggregates for concrete construction, this policy would incite recycling plants to invest in crushing and screening equipment and to propose recycled aggregates that can be used in structural concrete.

In **Malaysia**, a study on the implementation of SP in the Malaysia construction industry found that while construction practitioners are very enthusiastic about SP this is still very new and at the preliminary stage and its adoption is fragmented (Bohari et al., 2017). The interviewees in this study reported that client commitment is the top priority as this stakeholder holds decisive role in the adoption of SP in construction projects. The study recommended devising strategies such as expanding the system to create more awareness, making SP mandatory and enhancing the institutional system by providing incentives and recognition to maximize the benefits of SP in the construction industry. Esa et al. (2017) stated that to ensure that there is a continuous effort in managing wastes, transforming the procurement methods in Malaysian context is imperative. The authors suggested that introduction of SP initiatives and a clear statement in document contracts to make construction actors well aware of waste management practices and decisions can help the industry and government sector achieve resource efficiency.

In **South Korea**, a study commissioned by UN Environment Program<sup>24</sup> shows that the total expenditure on green products by all public institutions increased from USD 759 million in 2006 to USD 2,945 million in 2017. The percentage of green product procurement over the total expenditure on those product categories was 47.5%. The authorities that most contributed to those results were local authorities despite the fact that their SP levels were the lowest compared to other types of authorities, as SP levels over their expenditure in those categories were only 35.2%, compared to 74.8% for public enterprises. This is partly because local governments procure relatively large amounts of building and construction materials with a low SP rate in relation to the total expenditure in that category. Given the large amount of government spending on building and construction and the complementary measures taken to promote SP in this sector, building and construction materials now account for the largest share of SP (47.9% in 2017).

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<sup>26</sup>Competence Centre for Sustainable and Innovative Public Procurement. 2019. Sustainability of public procurement in Finland. <https://bit.ly/3bPFcYk>

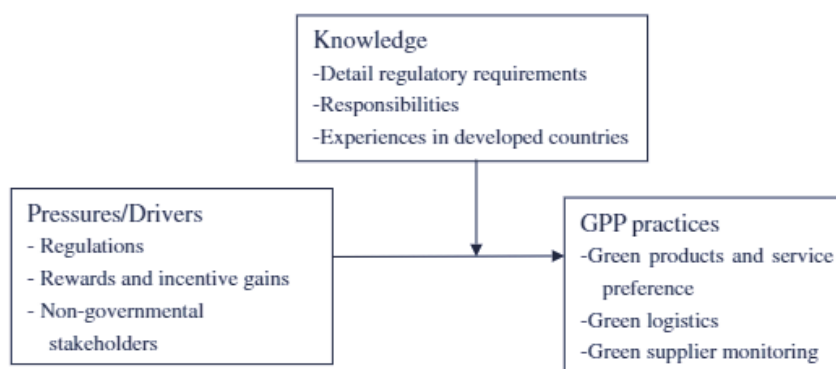
<sup>27</sup> Bougrain, F. 2017. Impact of green public procurement on the market of recycled concrete. International HISER Conference on *Advances in Recycling and Management of Construction and Demolition Waste* 21-23 June, Delft University of Technology, Delft, The Netherlands.

In **China**, a study estimated that a government-imposed SP mandated utilisation of at least 15% recycled construction materials for public projects in Chongqing can result in reusing more than 1.1 million m<sup>3</sup> of second hand bricks and 1 million tons of RCA (He et al., 2014). The authors suggested that the government should pursue three C&D waste management policies including landfill levy, subsidies for recycling and SP. The authors highlighted that reasonable government SP is the most promising policy option to establish long-term mechanism of using recycled C&D waste in the construction industry.

## 8 Conceptual model for implementation and promotion of SP

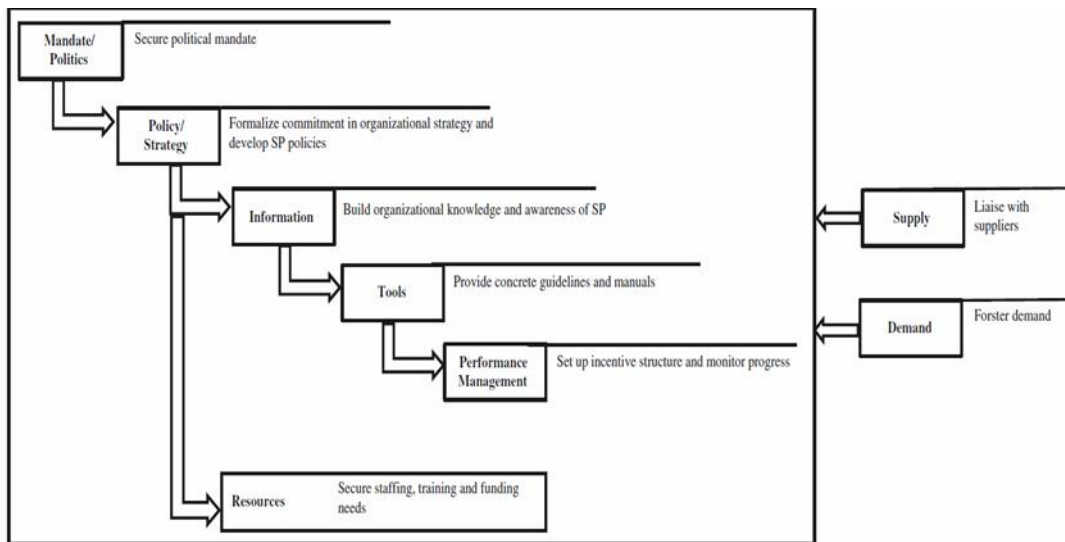
A conceptual model to implement and promote SP can guide SP practices and gets followed by procurement professionals both in public and private sectors. In this section, some of these models that are developed in different contextual conditions are characterised. These models are not necessarily specific to C&D waste but have relevance and application to this waste stream.

**GPP conceptual model in China:** This model is underpinned by three clusters of factors including pressures or drivers, knowledge, and GPP practices. External pressure such as regulations can stimulate GPP practices while officials need tools and knowledge to effectively implement GPP practices. In this model (Figure 3), developers posit that various drivers and pressures can motivate the adoption of GPP practices while GPP knowledge moderates this motivation. GPP practices can be defined as integrating environmental concerns into public procurement processes. Thus, the GPP practices construct in this model includes green products and service preference, green logistics and green supplier monitoring. Drivers can derive from regulations, non-governmental stakeholders, and rewards and incentive gains. Knowledge, as a construct, can include knowledge about detailed regulatory requirements, responsibilities, and experiences of developed country practices.



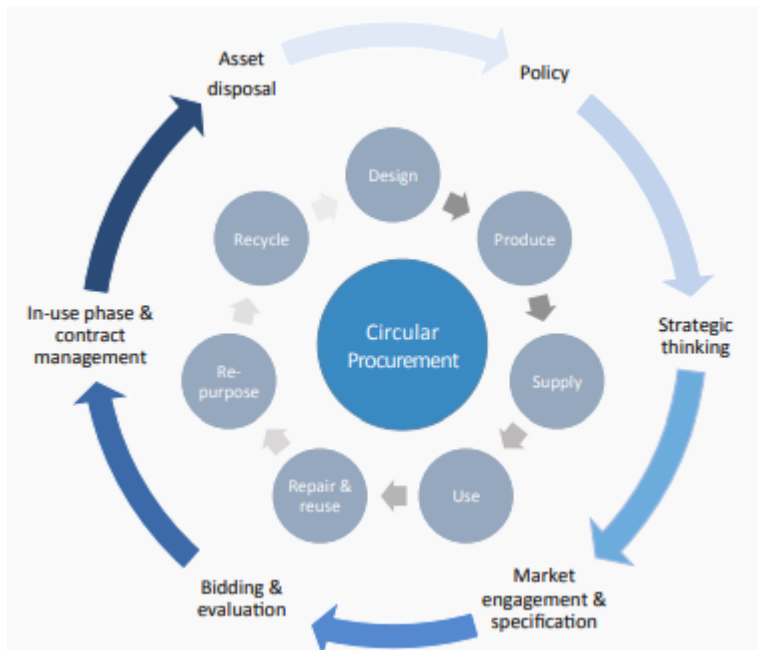
**Figure 3.** A conceptual model developed to promote GPP in China.  
Source: Zhu et al (2013)<sup>21</sup>

**Sequential implementation model**-this model is constructed in alignment with barriers identified in a study (Hasselbalch et al., 2015) that in which a series of interviews with experts employed in UN agencies about SP implementation and promotion were conducted. Based on this model, What the higher-order issues must be resolved before the lower ones can be operationalised effectively. For instance, training staff in SP makes little sense before securing the political mandate to do SP and institutionalizing this mandate in the organization's strategies and policies.



**Figure 4.** SP sequential implementation model  
Source: Hasselbalch et al. (2015)

**Resource Efficient Business Models (REBus)**, when adopting circular thinking, the procurement cycle can be proactively used to influence key areas of the construction process, from product design and manufacture, to use and disposal. The inner loop of Figure 5 shows a simplified process cycle for construction projects. It highlights the key stages for embedding circular thinking and decisions within the product and procurement cycles. Each stage has differing degrees of complexity depending on the nature of the construction project, e.g. building or infrastructure. A key element of circular thinking in procurement is embedding thinking and action by the relevant stakeholders in each stage of the cycle.



**Figure 5.** Embedding circular thinking within the material and procurement cycles (CP REBus model)<sup>28</sup>

<sup>28</sup> Dutch Ministry of Infrastructure and the Environment .2017. REBus Construction Lessons report. <https://bit.ly/2RIXUJX>

## **9 Concluding remarks**

It is argued that purchasing power of the government can create demand for recycled C&D products. This report reviewed SP policies and practices in Australia and overseas. To further understand the effectiveness of SP initiatives, the major enablers and drivers of the adoption of SP were identified. This is completed with demonstration of SP models that can be applied to C&D waste stream.

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