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***Design for Environment (DfE) Best Practices
Lessons for British Columbia's
Ministry of Environment***

Prepared for:
**British Columbia
Ministry of Environment**

Prepared by:
Five Winds International



www.fivewinds.com

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EXECUTIVE SUMMARY

The B.C. Ministry of Environment requested this study to deepen their understanding of best practices among other jurisdictions to encourage design for environment (DfE) and identify potential opportunities to incorporate these into its existing Recycling Regulation and non-regulatory initiatives outside of this regulation. To achieve this the project team: reviewed the practices and interviewed experts in 5 jurisdictions which provided a combination of leading practice and relevant lessons for B.C.'s context (i.e. being a smaller jurisdiction); interviewed four additional experts in the field of DfE in regulations; and developed this report.¹

The five jurisdictions which were reviewed for this report were: Japan's Top Runner Program, the efforts of Minnesota's Pollution Control Agency; the European Union's Energy Using Products Directive; U.S. Executive Order 13423 (the EPEAT Federal Acquisition Regulation); and the State of Victoria's Design for Sustainability program. Below we provide a brief description of each program.

Japan's Top Runner Program: A program designed to reduce energy use from non-industrial sources sets standards based on leading practice within product categories. It provides competitors a time frame to achieve this baseline standard and through a number of market mechanisms encourages companies to exceed the baseline performance level.

Minnesota's Pollution Control Agency: MPCA embraces a number of leading practices to achieve their aims and reduce the amount of waste going into their landfills. Examples of these efforts are their product stewardship frameworks where they establish a target for collection, but allow individual producers to determine how best to achieve them and using the EPEAT standard to guide their procurement decisions.

EU's EuP Directive: The Energy Using Products (EuP) Directive is one of the most widely known and recognized efforts to encourage DfE through regulation. The Directive is designed to encourage companies to improve the product's environmental performance across its lifecycle while still balancing this with technical and budgetary requirements.

U.S. Executive Order 13423: The Executive Order is a pull mechanism which dictates that all government procurement for those products where an Electronic Product Environmental Assessment Tool (EPEAT) criteria exists need to purchase a certain percentage of the approved products. Further, the EPEAT standard has been adopted by numerous jurisdictions and major procurement departments as a guide for their purchasing.

State of Victoria's Design for Sustainability Program: Located in the South of Australia the State of Victoria Design for Sustainability Program works with local Design Associations to reduce the hurdles to incorporating DfE into common design practice.

Key lessons for B.C. from these leading jurisdictions include:

- Program Design
 - When establishing a new standard, B.C. may want to consider establishing a clear minimum mandatory standard which is communicated widely and provide market

¹ When considering the results of this study it is important for the reader to keep in mind that its scope was limited and that efforts to encourage DfE are continually changing and evolving and there is no simple answer as to how to do it.

- incentives to encourage companies to design products that perform even better than this;
 - A lesson from a number of experts interviewed was that jurisdictions can be bold about setting ambitious targets for industry to pursue;
 - Where possible B.C. may want to consider establishing regulations which encourage continuous improvement by clearly articulating to industry from the get-go that the baseline standard will become increasingly stringent over time;
 - B.C. may want to consider allowing manufacturers a high degree of flexibility in determining how best to meet set mandatory targets;
 - Where possible B.C. may want to consider establishing a transparent, multi-stakeholder approach for standard development;
 - Where appropriate B.C. should consider accelerating the product approval process by forgoing an actual physical label and opting for product inclusion on a list which can be continually and easily updated;
 - Consider wording during program definition to allow for the expansion of the program as new issues emerge or standards become more stringent;
- Being Opportunistic
 - Jurisdictions should aim to be opportunistic in terms of which products to regulate and should be prepared to incorporate new product categories into regulations as public or industry interests allow;
- Harmonisation
 - Especially as a smaller jurisdiction, B.C. may want to consider adopting existing standards or aim for harmonization with leading regulations to improve effectiveness and adoption of the program by industry and where possible avoid proprietary standards;
- Voluntary/Pull Initiatives
 - Where possible voluntary standards can be made more credible and effective through a comprehensive stakeholder process and sufficient pull incentives in terms of market gain or differentiation;
 - As much as possible everyone should be invested in the initiative's success to ensure effective stakeholder engagement;
 - Where possible B.C. should consider using government procurement as an effective tool to encourage DfE;
 - Even with limited resources, jurisdictions can act as catalysts for change through establishing effective and innovative partnerships;
 - There may be an opportunity to raise awareness of B.C.'s design sector and showcase B.C. designers as cutting edge in order to help them have a greater influence on DfE; and
- Risk of Inaction
 - B.C. should consider the risks of doing nothing. There is the risk of becoming a dumping ground for substandard products if one does not have a standard for those products for which other jurisdictions do.

As part of the analysis we also captured a number of challenges and barriers governments face when trying to initiate DfE programs. In the report we provide examples or initial steps B.C. could take to overcome or address these. The challenges identified include: setting an appropriate standard, stakeholder engagement, ability to influence the market, lack of direct customer demand, producer's lack of trust in government, working together with other jurisdictions, moving from collective systems to individual responsibility, and providing tangible incentives for producers.

In section V we identify the best practices for encouraging DfE in industry; as well as provide recommendations on how these could be incorporated into B.C.'s activities. These practices are:

1. Provide **a clear policy or statement of intent** to promote design changes that will improve environmental outcomes across the life cycle (specific focus areas such as toxics or energy efficiency will be product specific and may be identifiable through existing studies or stakeholder engagement exercises);
2. Develop **a flexible policy approach that focuses on results** rather than the means of achieving them;
3. Provide **incentives for producers to increase their share of the responsibility for managing their product throughout its life cycle** (physically and/or economically, fully or partially) and to take environmental performance considerations into account upstream at the design phase;
4. Provide **incentives for consumers to choose products or packaging** with better environmental performance over the life cycle;
5. Involve **stakeholders that represent the full product value chain** (or life cycle), including suppliers, producers, retailers, consumers etc. in the development and regular evaluation of stewardship programs that incorporate DfE as a policy objective;
6. When designing programs it is best if they **incorporate continual improvement, clear baselines, target-setting related to DfE, and instructions for monitoring and enforcement**;
7. Develop **provincial product category priorities and a clear step-by-step process for program development** (e.g. start with stakeholder engagement, establish minimum mandatory standards, create effective incentives etc.) to allow the province to respond opportunistically to new scenarios;
8. Identify and adopt **applicable and leading existing standards** rather than developing unique solutions or proprietary standards; and
9. Where possible **act as a catalyst** to reduce barriers to DfE.

Although B.C. is doing a number of the following, some at a leading level, they are seen as important in encouraging a greater focus on DfE and as such the authors of the study would encourage their continuation and, where opportunities exist, their deepening within the Recycling Regulation. At a high level these include:

1. Taking an outcome based versus prescriptive approach;
2. Incorporating concepts of continual improvement;
3. Using the experience of other jurisdictions to identify future product categories to include in the regulations, ideally harmonizing requirements with existing regulations;
4. Developing a comprehensive stakeholder engagement process;
5. Incorporating existing regulations (e.g. RoHS and EPEAT) into the regulation; and
6. Investigating alternative vehicles to encourage DfE.

Finally the findings of the study indicate that B.C. could have a positive influence on encouraging DfE both within and outside of B.C.. To achieve that the research team provides a recommended path forward based on the findings of the research. The key aspects of this are:

1. Define the objective of a DfE program and communicate the Ministry's intention to pursue it widely;
2. Engage with a broad group of stakeholders;
3. Engage with wider DfE regulatory community to learn from and identify opportunities for collaboration; and

4. Develop a structured approach to incorporating new product categories into the province's DfE program.

I. ACKNOWLEDGEMENTS

The success of studies of this nature depends on the enthusiasm and cooperation of the participating organizations. Five Winds International would like to thank the Product Stewardship team of the Community Waste Reduction Section, B.C. Ministry of Environment for their support in the development of this report. We would also like to thank the managers from the five public sector jurisdictions who took the time to share their experiences and expertise implementing their own stewardship programs, and our network of international experts who contributed insights on the role of government in supporting DfE initiatives among industry. The names of these individuals are contained in Appendix 1 (Public Sector Jurisdictions Interviewed) and Appendix 3 (International Experts on DfE and EPR).

Their open and honest sharing of information will assist B.C.'s Ministry of Environment in its assessment of design for environment (DfE) opportunities in relation to the province's Recycling Regulation, and ultimately to keep pace with, and benefit from, innovative policy and program developments in the area of product stewardship.

The Project Team was comprised of Kevin Brady, Jennifer Cooper, Johanna Stange and Chris Peterson, all of Five Winds International. For more information on this study, please contact:

Kevin Brady,
Director
Five Winds International
k.brady@fivewinds.com
Tel: +1 (613) 722-6629 x222

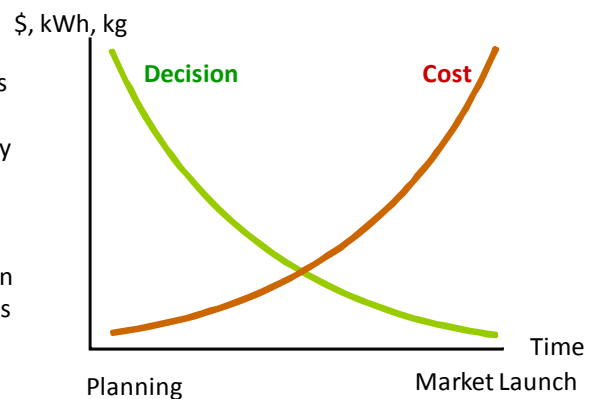
II. CONTEXT

WHY DfE IS IMPORTANT

Leading governments and companies have long understood that the conceptual design stage is the most effective place to reduce the environmental impacts of a product system. This is because at the design stage, problems can be avoided at relatively low cost in comparison to solving problems once the production system is up and running. For example, it is more effective to design toxic substances out of electronics products than it is to manage those substances once they reach the end of their useful life.

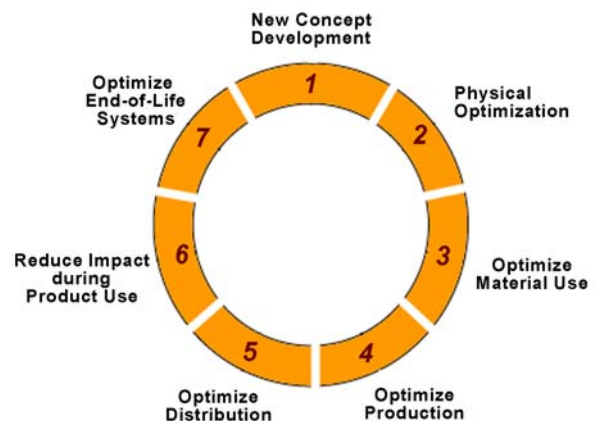
Design for Environment (DfE) is a concept and a set of tools (e.g., environmental attribute checklists for product engineers, life cycle assessment, environmental performance questionnaires for component suppliers, expert redesign panels) that help industry improve the environmental performance of a product across its entire life cycle.² Design strategies

At the design stage it is much more cost effective to address key parameters such as energy, weight, emissions and production wastes than it is once the product is launched



that improve environmental performance include the selection of low impact materials, ensuring the use of “clean” production technologies, optimizing distribution systems, enhancing use phase attributes (e.g., product life time, resource consumption), and ensuring the product has minimal impact on the environment once it has reached the end of its use (e.g., through effective disassembly and recycling of the product). Some organization are now also exploring Design for Sustainability which incorporates not only environmental considerations but also a range of other sustainability practices associated with a product system, from the sustainability of the materials, to labour practice, to total costs.

Effectively engaging industry to adopt these design strategies is a challenge as companies are typically focused on dimensions of their product system with direct benefits for themselves or their customers such as quality, cost, time to market, and profit. Also once the product is sold, problems generated by poor design often create no cost to the company that produces it (e.g. the product manufacturer bears no responsibility or costs



The Strategy Wheel

² Five Winds International worked with the National Research Council (Industrial Research Assistance Program) to create a DfE Guide. The Strategy Wheel was adapted from the Dutch Promise Manual, and can be found at www.nrc.ca/dfe/ehome/ehome.html

associated with ease of dismantling or sorting). One key to successful DfE initiatives, whether initiated by industry or government, is to align DfE with internal and external business, market and regulatory drivers.

III. OBJECTIVE AND METHODOLOGY

STUDY OBJECTIVE

The B.C. Ministry of Environment requested this study to deepen their understanding of best practices among other jurisdictions to encourage design for environment and identify potential opportunities to incorporate these into its existing Recycling Regulation and non-regulatory initiatives.

METHODOLOGY USED TO MEET THE OBJECTIVE

To meet the B.C. Ministry of Environment's objective, the work was divided into three Tasks:

- **Task 1: Review Practices in Other Jurisdictions** – the operation of, and outcomes from, programs in five leading public sector jurisdictions were investigated through interviews with government personnel, and other experts. The review identified challenges, opportunities and lessons learned from their experience incorporating DfE principles and incentives.
- **Task 2: Expert Interviews** – experts in the area of Extended Producer responsibility were interviewed to capture their knowledge on program design, best practices and lessons learned from other jurisdictions, as well as, success factors and barriers. In addition lessons from a similar study conducted in 2006 for the Government of Alberta were incorporated into this report
- **Task 3: Analysis and Development of Recommendations** – The outcomes of tasks 1 and 2 were analysed and recommendations on potential actions the B.C. Ministry of Environment could undertake to advance DfE (either into its existing Recycling Regulation or through broader programs) were developed.

STUDY LIMITATIONS

The information and findings presented in this report should be interpreted with the following limitations in mind:

- **The scope of the study was limited.** Programs from only five public sector jurisdictions were reviewed and only four international experts were interviewed. The study is therefore not an exhaustive study, and B.C.'s Ministry of Environment is encouraged to undertake additional analysis when moving forward with any recommendations.
- **Design for environment is a concept and set of tools that is continually evolving and there is no simple or flawless model to adopt in order to ensure adoption of DfE.** Variations in approaches and drivers, as well and differences between industrial sectors and product

categories make it challenging to propose specific recommendations regarding the best way to integrate DfE into policy. Therefore many of the recommendations for improvement are based on expert opinion gathered through interviews and that of our Project Team. Therefore, as with the scope B.C.'s Ministry of Environment is encouraged to undertake further analysis before implementing any of the recommendations.

IV. HOW HAVE OTHER JURISDICTIONS ATTEMPTED TO INCORPORATE DfE INTO THEIR PROGRAMS?

There are three main approaches governments take to promote DfE in industry – a ‘pull’ or voluntary approach (e.g., informative or supportive programs, public procurement, voluntary agreements), a ‘push’ or regulatory approach (e.g., obligatory take back, material ban) or a combination of both. This study reviewed the practices of five public sector jurisdictions reflecting a range of these approaches. Although no single program claims to provide a comprehensive solution, each program provides lessons that will be valuable for B.C. as they move forward with any new policy designs. Further, a consistent comment from the experts interviewed was the need for a combination of policy instruments to encourage DfE in industry.

The five programs which were reviewed were: Japan's Top Runner Program; the efforts of the Minnesota Pollution Control Agency; European Union Energy Using Products Directive; US Executive Order 13423 EPEAT Federal Acquisition Regulation, and the State of Victoria, Australia, Design for Sustainability Program.

Below we outline the structure of the five programs which were reviewed along with the key take away messages for B.C. if they are to move forward with DfE initiatives. In the following section we outline the key recommendations for B.C. and how these could be incorporated into its existing regulations or future policy directions. (See additional programs reviewed in the Alberta Study in Appendix A.)

Japan Top Runner Program

The **Top Runner Program** was introduced in 1999 and represents a revision of the Japanese Energy Conservation Law of 1979. It was introduced as one of the primary approaches to reduce energy use from non-industrial sources including the residential, commercial, and transportation sectors. The Top Runner Program can be characterised by its standard setting and mandatory goal achievement requirement, as well as its built-in mechanism for continuous improvement. The program operates on the maximum standard value principle, in other words, the standard is based on the product with the best energy efficiency in its particular target category at the time of standard setting. Standard setting also takes into account the potential for technical innovation and diffusion, so it is not automatically the

**Figure 1 – Japan Top Runner:
Current Target Products (M)**

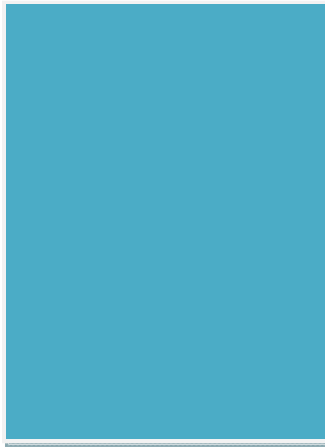
Passenger Vehicles
Freight Vehicles
Transformers
Air Conditioners
Space Heaters
Gas Water Heaters
Oil Water Heaters
TVs
VCRs
DVD Players
Computers
Magnetic Disk Units
Photocopiers
Fluorescent Lights
Microwaves
Gas Cooking Appliances
Refrigerators
Freezers
Vending Machines
Rice Cookers
Electric Toilet Seats

M – mandatory

product with the highest energy efficiency that becomes the standard setter it could be a technology which has not yet been applied commercially.³ Once the target value has been set, a target year by which other producers must meet the standard is set – usually within a timeframe of between 3-10 years⁴, depending on the design cycle. The target value is achieved if a company's weighted average energy efficiency of all products shipped domestically in a given year meets the standard.

Figure 1 outlines the current products legislated by the program. Products were chosen using three main criteria: the quantity used in Japan, their high energy consumption in the use-phase, and potential for energy efficiency improvements. It is planned that these categories will be continually expanded and refined. This includes the possibility of future exclusion, if marketplace importance of a particular product decreases or changes.

Decision-making within the Top Runner program is based on a broad consultative process including 3 committee levels: a METI (Ministry of Economy, Trade and Industry) department-level committee; a standards-level committee; and category-specific level committees for each product, all informed by working groups.⁵ These committees consist of experts, academia, consumer groups, local government and industry representatives. They define which products to include, the standard content, and the target years. Interim reports are opened up to public comment. Once written, the standards are also reported to the WTO's Technical Barriers to Trade division for transparency. Once a proposal to incorporate a certain product into the program has been put forward, it usually takes from 1 – 2 ½ years to enact the legislation.⁶



Once the standard is in place, no interim evaluations or progress reporting is built into the program, and the methods and timing of implementation are left completely up to the manufacturers. Programs are re-evaluated after target year arrival, and more stringent targets can be set into place after revisions. As a general rule, the timeframe to reach the next target becomes shorter than the first. Thus far, targets have in some cases even been met earlier, or energy efficiency improvements have exceeded the initial expectations set out by the program.⁷

When it comes to enforcement, Japan has taken a “name and shame” approach for non-compliance. This is a three step process, involving initial and confidential “advice” for the transgressor from the Ministry, followed by publicizing of the transgression with failure to act upon the advice, and the levying of a fine for non-compliance.

Since the responsibility for compliance lies on the supply-side with manufacturers / producers, neither retailers nor consumers are targeted except when marketing or purchasing the Top Runner products. Smaller manufacturers holding less than a certain level of annual sales volume are exempted from the legislation, although they are still required to provide information about their product. Manufacturers are required to communicate the energy performance of their products to their customers. A voluntary labelling scheme – the same “e” symbol in red or green with a percentage – communicates the level of conformity with the Top Runner standard, and is shown in product catalogues available in

³ Tojo, 2005. pg.8.

⁴ METI, 2008.

⁵ Tojo, 2005. pg. 33.

⁶ METI, 2008.

⁷ Ibid. (see Table, pg. 9)

retail shops and is affixed to the products themselves. As an additional incentive, the designation “e-Shop” is awarded to those retailers who excel at promoting and showcasing energy efficient products.

Key Take Away Messages for B.C.

- When establishing a new standard, Japan’s Top Runner program established a clear minimum mandatory standard which is communicated widely and provide market incentives to encourage companies to design products that perform even better than this;
- Japan’s Top Runner program engaged individual companies rather than industry associations early in the target-setting process in order to identify an appropriate minimum level for the standard.
- A lesson from a number of experts interviewed was that jurisdictions can be bold about setting ambitious targets for industry to pursue;
 - As shown by the number of products exceeding the mandatory baseline standard ahead of schedule, the Top Runner program could have afforded to have been even more aggressive in its initial standard setting or could have decreased the allowable time before the standard was reviewed.
- Japan’s Top Runner program established a transparent, multi-stakeholder approach for standard development.
 - By incorporating a continual improvement process the Top Runner program has established a process to continually encourage the adoption of improved technology rather than a one time effort.

Minnesota Pollution Control Agency

In 1999, the state of Minnesota adopted the first product stewardship policy in the United States. The Minnesota Pollution Control Agency (MPCA) relies on a mix of different strategies to promote product stewardship and handle waste. It works together with the Minnesota Legislature, state agencies and other stakeholders to develop product-specific policy, but also employs voluntary initiatives to promote and pursue product stewardship objectives. A list of current and emerging programs can be found in Figure 2.

The MPCA takes a largely opportunistic perspective; providing no hard criteria – like cost, toxicity or collection availability – for implementation. Measures are thus often non-prescriptive, with manufacturers, local governments, and interested industry associations coming up with their own proprietary methods for meeting targets, at times even initiating new programs, as is the case with the emerging mattress program. The main aims, however, remain the increase of the degree of accountability of producers and the movement of manufacturer responsibility upstream in the value chain.

Figure 2 – MPCA Programs

Current Initiatives

*Electronics
Beverage Containers
Telephone Directories
Paint
Compact Fluorescents
Carpet
Automobiles*

Emerging Programs

*Pharmaceuticals
Gypsum Wallboard
Mattresses*

As one program example, electronic waste was identified early on as a priority for Minnesota's Product Stewardship Program. The Minnesota Electronics Recycling Act came into force in July 2007 and it legislates the recycling of "video display devices" from households: televisions, computer monitors, and laptop computers. To be able to sell these devices, manufacturers register with the state and pay a registration fee to cover the overhead costs of the MPCA. They then are responsible for collecting and recycling their electronic devices to meet recycling goals set out in the law. The Electronics Recycling Act also includes a requirement to disclose hazardous substances levels that exceed the maximum concentrations set out in the RoHS Directive of the European Parliament (Directive 2002/95/EC).

Within the electronics program, manufacturers have the flexibility to form consortia and to contract and organize directly with recyclers in the state defining their own method of meeting the collection goals. These were 60% of preceding years' sales in the first collection year increasing to 80% in the second year of the program, with a ½ pound credit for every pound collected in rural areas.

Results are measured quantitatively through an annual report submitted by manufacturers, which details the results of their sales and collections for each program year. Manufacturers who fall short of attaining their quota pay a per pound fee for the difference, while manufacturers who exceed their quota can bank credits for up to three years. The revenue agency that audits the reports is still in the process of developing ways to flag potential outliers within the reports. Every two years the MPCA is expected to report back to the Legislature to report on recommendations for improvement to the Act.

Additionally, Minnesota has adopted the Electronic Product Environmental Assessment Tool (EPEAT) standard at the state level in order to increase green procurement. At this time EPEAT applies to the purchase of all IT equipment, and may expand to include purchase of carpeting and office furniture in the near future. Some school districts and local governments are already using the same contract to make their IT purchasing decisions. Adopting the EPEAT standard (already being applied at the federal level, see description below) was easier than developing a state specific standard. Minnesota uses the bronze level as the baseline requirement with no incentives yet for purchasing higher standards.

Key Take Away Messages for B.C.

- MPCA allows manufacturers a high degree of flexibility in determining how best to meet set mandatory targets;
 - With electronics, the MPCA established clear take-back criteria but did not define the collection method, which has varied depending on the manufacturer and location.
- MPCA has established a transparent, multi-stakeholder approach for standard development.
- MPCA has been opportunistic in terms of which products to regulate and is prepared to incorporate new product categories into regulations as public or industry interests allow.
- As a smaller jurisdiction, MPCA has adopted existing standards and aimed for harmonization with leading regulations to improve effectiveness and adoption of the program by industry and where possible avoided proprietary standards;
 - For example California, Washington, and Oregon are all developing similar product stewardship frameworks based on Minnesota's. This could lead to the creation of a product care entity that regulates several states or jurisdictions at once.
 - Minnesota developed its list of materials based off of the RoHS directive rather than developing a unique list.

- Adopt standards accredited by ANSI or international standards bodies where possible, or bring local regulations up to that level.
- A lesson from a number of experts interviewed was that jurisdictions can be bold about setting ambitious targets for industry to pursue;
 - Minnesota had expected approximately 4 lbs per person to be taken back but it was closer to 6.5 lbs pp collected in the first year
 - Even within a short timeframe (e.g. MN E.R.A. signed May 8, 2007, program began July 2007), it is possible to get everyone on board with education, outreach and workshops.
- MPCA has been cognisant of different incentives for different areas within the same jurisdiction
 - In Minnesota they provide a ½ lb credit for all material collected in rural areas as they recognized differences between urban and rural barriers and challenges. (e.g. consumer/resident drop-off fees fine in metropolitan areas, but more problematic in rural areas, where fees could equal illegal dumping)

European Union Energy Using Products Directive

The **EU Directive on Energy-using Products** (Directive 2005/32/EU), officially called the **Ecodesign Directive**, was passed and came into force in 2005 and establishes a framework for the setting of eco-design requirements for energy-using products (EuP).⁸ It represents the first legislation implementing the Commission's Integrated Product Policy (IPP) strategy. Member states had until 11 August 2007 to implement it into national law. A Directive, as distinct from a Regulation, allows flexibility in the chosen method of implementation by each member state. Only the time period to implementation is defined. Additionally, in contrast most other directives, Directive 2005/32/EU does not allow national governments to increase the stringency of the legislation beyond the maximum values set out in the Directive.

In principle, this framework directive applies to all energy-using products (except vehicles for transport) and covers all energy sources.⁹ In practice, however, the following selection

Figure 3 - Status of Preparatory Studies, EuP Directive

<i>PCs, Laptops and Monitors</i>	<i>C</i>
<i>TVs</i>	<i>C</i>
<i>Stand-By Energy Use</i>	<i>C</i>
<i>Battery Chargers, Power Supply</i>	<i>C</i>
<i>Office Lighting</i>	<i>C</i>
<i>Public (Street) Lighting</i>	<i>C</i>
<i>Imaging Equipment (e.g. printers, copiers)</i>	<i>O</i>
<i>Boilers and Combi-Boilers</i>	<i>O</i>
<i>Water Heaters</i>	<i>O</i>
<i>Air Conditioning & Ventilation</i>	<i>O</i>
<i>Electric Motors (1-150 kW)</i>	<i>O</i>
<i>Commercial Fridges & Freezers</i>	<i>O</i>
<i>Domestic Fridges & Freezers</i>	<i>O</i>
<i>Dishwashers & Washing Machines</i>	<i>O</i>
<i>Launched in 2007:</i>	
<i>Solid Fuel Small Combustion Installation</i>	<i>O</i>
<i>Laundry Driers</i>	<i>O</i>
<i>Vacuum Cleaners</i>	<i>O</i>
<i>Complex Set Top Boxes</i>	<i>O</i>
<i>Domestic Lighting</i>	<i>O</i>
<i>Simple Converter Boxes (for digital TVs)</i>	<i>O</i>
<i>C – complete O ongoing</i>	
<i>Updated current status:</i>	
http://www.mtprog.com/cms/eup-implementing-measures/	

⁸ see http://ec.europa.eu/enterprise/eco_design/directive_2005_32.pdf

⁹ see http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm

criteria for proposed implementing measures for a product are used:

- 1) Significant volume of sales and trade within the European Community, typically threshold is 200,000 units/yr.
- 2) significant environmental impact
- 3) significant potential for improvement without incurring excessive costs¹⁰

The initial product groups for implementing measures in the “transition period” – the time until the Working Plan was written in 2007 outlining 10 non-binding priority candidate products that match these criteria – were outlined by the Commission itself. These included reducing stand-by losses for product groups such as HVAC systems, office equipment, and domestic appliances. Figure 3 outlines the current status of those product groups currently approved for implementing measures. These are all currently going through the motions between preparatory study (identifying environmental aspects) and writing of draft implementing measures discussed in a consultation forum before final adoption and release of the implementing measures by the Commission. Stakeholders participate throughout the whole process, first through workshops during the preparatory studies (see Figure 4), and then in the consultation forum for drafts.¹¹

Figure 4 - Methodology for Completing Preparatory Studies:
(to be applied consistently)

- Task 1 – PRODUCT DEFINITION
 - within a product group, what types of this product should be included and excluded?
- Task 2 – ECONOMIC ANALYSIS
 - market investigation and quantification of current stock of product in EU market and expected growth
- Task 3 – CONSUMER PERSPECTIVE
 - actual usage and local infrastructure
- Task 4 – TECHNICAL ANALYSIS EXISTING PRODUCTS
 - investigate whether existing standards/regulations for this product group can be used
- Task 5 – BASE CASE AND ENVIRONMENTAL ASSESSMENT
 - look at product in all stages of its life cycle to quantify environmental impacts for each sub-group of products using the MEEuP tool (life cycle tool)
- Task 6 – TECHNICAL ANALYSIS OF BEST AVAILABLE TECHNOLOGY (BAT)
- Task 7 – IMPROVEMENT POTENTIAL
 - BAT, options, impacts, long term targets
- Task 8 – SCENARIO ANALYSIS
 - create an impact assessment / sensitivity analysis reflecting impacts on environment, market, and policy

Sources: Personal Communication, Dr. Constantin Hermann, PE International, 23 Sept 2008;
http://ec.europa.eu/energy/demand/legislation/doc/2006_11_21_workshop_meeup_en.pdf

¹⁰ see http://www.getrid.uk.com/eup_directive.php

¹¹ Personal Communication, Dr. Constantin Hermann, PE International, September 29, 2008

The planning and adoption of the implementing measures is set out by this document: <http://ec.europa.eu/energy/demand/legislation/doc/planning.pdf>. While implementing measures do not adopt preparatory studies one-to-one, they are usually quite closely aligned.¹² Current implementing measures are to be revised every 3-5 years.

After the identification of significant environmental aspects during the preparatory studies, legal obligations for manufacturers begin with the adoption of the implementing measure by the Commission.¹³ The set eco-design parameters expect manufacturers to consider the consumption of materials and energy throughout the entire life cycle of the product group from raw material to end-of-life. The goal is to seek out design options that will improve the product's environmental performance while bringing this in balance with technical and budgetary limits. In some circumstances manufacturers may choose to pursue and adopt labels which are recognised equivalents by the EU. Otherwise, manufacturers carry out a conformity assessment – most often in the form of a self-assessment and usually within the construct of their environmental management system – and affix the “CE” mark. (The CE mark is a European Community label, and shows a declaration of conformity with the relevant EU Directive(s) of which this is one, but not the only one.) Enforcement most often occurs during EMS audits, when proof of meeting the requirements must be shown. If this is not the case, a product can be banned from the market. The national governments of each respective member state define who, how, and how often the auditing will be done. Thus the responsible department may differ from country to country.

Adoption of implementing measures must be transparent, and a distinction can be made between generic and specific requirements within these. As a general rule, specific requirements that set out limit values and thresholds have been favoured, and governments have been hesitant to give priority to self-regulatory activities within industry that would allow for generic implementation. Positive experience with the medical equipment services branch, however, which has only a few major actors, has been supported by the Commission for its precedent-setting potential. For the most part, however, markets, industry, and policy are not yet ready for generic implementing measures.¹⁴

A recent Action Plan of the Commission, communicated in July of 2008 (COM 2008 397), puts forward a proposal for the extension of the Ecodesign Directive. Under this Action Plan, the scope of the Directive will be expanded beyond *energy-using* products to include all *energy-related* products – these being all products that have an impact on energy consumption during use, such as, window frames and products with insulating properties. The criteria for implementing measures will remain the same.

Key Take Away Messages for B.C.

- The EU EuP establishes regulations which encourage continuous improvement by clearly articulating to industry from the get-go that the baseline standard will become increasingly stringent over time
- By defining a clear process for how product categories move from being identified to being incorporated into the program the EuP program is able to expand its product category list to practically any product which may be of public interest.

¹² Ibid.

¹³ see http://ec.europa.eu/energy/demand/legislation/doc/2006_11_21_workshop_framework_en.pdf

¹⁴ Personal Communication, Dr. Constantin Hermann, PE International, September 29, 2008

- Further, it is flexible enough to be applied to other areas of concern. Dr. Hermann commented that had it been in place ahead of the WEEE and RoHS directives they could have simply been addressed using the EuP structure
- Where possible publicize the initiative widely. Although an EU Directive few manufacturers anywhere in the world are not aware of the EuP and consider it when making design choices understanding that it may become a model for other jurisdictions to follow.
- The EU EuP used a highly collaborative process which engaged industry in the design and development of its standards.

US Executive Order 13423 EPEAT Federal Acquisition Regulation

The **US Executive Order 13423** on **Environmentally Preferable Purchasing** (EPP) was signed on January 24, 2007 and revokes and compiles three environmentally-focused predecessor Orders. The program is a federal initiative that requires federal agencies to purchase EPPs and services with the goal of increasing their availability, protecting human health, saving money, and improving the overall quality of government purchases. This includes, but is not limited to, the purchase of bio-based, energy- and water-efficient, and recycled-content products.¹⁵

Electronics is a fast-moving global market, and electronics stewardship is one of the key aspects addressed by the Executive Order (EO). Figure 5 delineates all of the focus areas. The adopted measurement criteria for electronics correspond to those of the Electronic Product Environmental Assessment Tool (EPEAT), which had already gained market acceptance before the EO as a voluntary goal within the Federal Electronics Challenge. Its proven successes in the evaluation of the environmental performance of electronics throughout their lifecycle made it an easy candidate for inclusion in the EO. Sec. 2. (h) of the Executive Order sets out that any federal agency acquiring (purchasing or leasing) electronic products must meet at least 95% of its requirements with EPEAT-registered product, unless there is no EPEAT standard for this product.¹⁶

Since this time, a similar clause has also formalized EPEAT in the Federal Acquisition Regulation¹⁷ that governs federal purchasing and which supersedes the EO and has an even firmer legislative basis. Additionally, EPEAT is contained in the public standard IEEE 1680¹⁸ which is a consensus-based standard developed in an open, transparent process in which anyone can comment on the process. As the product groups expand, standard 1680 is slated to define only the *structure* of EPEAT, while successors (1680.1, 1680.2 etc.) will set the environmental performance standards for the *products*.

Figure 5 – Goals of EO 13423

Energy Efficiency
Renewable Energy
Water Conservation
Sustainable Acquisition
Pollution Prevention / Toxics
Reduction
Recycling
High Performance Buildings
Fleet Management

****Electronics Stewardship**

*** focus of this section*

¹⁵ see <http://www.epa.gov/oppt/epp/pubs/guidance/executiveorders.htm>

¹⁶ see http://www.ofee.gov/eo/EO_13423.pdf for the official text of the Executive Order 13423

¹⁷ see <http://www.acquisition.gov/far/>

¹⁸ see <http://www.greenelectronicscouncil.org/epeat/index.htm>

EPEAT initially began as a rating system for computers, laptops and monitors¹⁹ to help procurement officers in the public and private sector evaluate, compare and select the appropriate product. EPEAT grew from an increasing demand from large institutional purchasers for greener electronics, and out of NEPSI's (National Electronics Product Stewardship Initiative) failure. Those involved in NEPSI were quick to see that end-of-life management was not enough, and there was a consensus that greater upstream emphasis was needed to incentivize Design for Environment (DfE). The development of the EPEAT criteria was in response to this.

Launched in July 2006, there are now over 800 certified products in the online registry produced by 29 international manufacturers.²⁰ EPEAT is competitive: there are a total of 51 environmental criteria within eight categories, 23 of which are required, 28 of which are optional.²¹ Depending on how many of the optional criteria are met, the EPEAT is a three-tier award:

Bronze level	meets all 23 required
Silver level	meets all 23 required and at least 50% of optional
Gold level	meets all 23 required and at least 75% of optional

Initially, the program was funded by the EPA through monies awarded to the Zero Waste Alliance. Currently, the EPA provides only partial grant funding for the development of associated new standards, so financial support of the program comes from subscriber fees collected when manufacturers list their product in the registry. Registration is sliding scale, allowing for the participation of SMEs (small & medium-sized enterprises) in the registry.

EPEAT was developed completely through a multi-stakeholder consensus decision-making process. A Board of Advisors comprised of a representative mix of the stakeholder groups sets policy for the program. Quantitative tracking of results occurs through an environmental benefits calculator created by the EPA, an LCA-like tool that measures the benefits accrued by EPEAT. Qualitative results are demonstrated directly by the way in which manufacturers compete for points in the registry.

Since EPEAT is a self-declared, voluntary eco-label, after market verification of the EPEAT standard occurs through a "guerrilla verification"²² system in which independent verifiers often respond to market information from competing manufacturers. The verification procedure is "very aggressive"²³ and has already resulted in some products and manufacturers leaving the registry. The publishing of the names of transgressors and information dispersal in the market has been an effective deterrent. Verification can take the form of disassembly observation or supply chain audits, which are the most common. EPEAT does not affix an actual physical label onto the products themselves, thus circumventing what for other eco-labels can often be months of lost benefit before products make it to market.

¹⁹ see <http://epeat.net>

²⁰ Personal Communication, Holly Elwood, US EPA. October 6, 2008.

²¹ There are no restrictions to international manufacturers wanting to register their products, although the US-centricity of some of the criteria may prove a minor barrier.

²² Personal Communication, Wayne Rifer, Green Electronics Council. September 16, 2008.

²³ Personal Communication, Wayne Rifer, Green Electronics Council. September 16, 2008.

Improvements are centered on new standard development efforts for new product sets and on a routine review of the existing product categories every three years, at which time changes in the bronze, silver, or gold levels are possible.

Manufacturers must offer product take-back for institutional sales, for which a fee can be charged.

Key Take Away Messages for B.C.

- Where possible voluntary standards can be made more credible and effective through a comprehensive stakeholder process and sufficient pull incentives in terms of market gain or differentiation.
 - For example, in the case of EPEAT numerous large procurement departments outside of the public sector have adopted the EPEAT criteria as guidance for their purchase decisions providing incentives for producers to participate and achieve higher EPEAT scores.
- The EPEAT process shows the benefits of ensuring everyone is invested in the success of the stakeholder engagement process.
 - This requires that all participants in the process agree with the aims and are working collectively to achieve them versus blocking or stalling the process.
 - To identify best practice it may be valuable for B.C. to engage with other jurisdictions to learn from their experiences.
- Especially as a smaller jurisdiction, B.C. may want to consider adopting existing standards or aim for harmonization with leading regulations to improve effectiveness and adoption of the program by industry and where possible avoid proprietary standards;
- As shown here government procurement can be an effective tool to encourage DfE.
- The EPEAT process accelerates the product approval process by forgoing an actual physical label and opting for product inclusion on a list which can be continually and easily updated.
- The EO has gained additional strength through its wording during program definition to allow for the expansion of the program as new issues emerge or standards become more stringent.
 - Those involved with the Executive Order commented that an important win for them was that the wording allowed for the expansion of products covered by EPEAT and their automatic inclusion in the government procurement program.

Figure 6 – D4S Program Objectives

- 1) **capacity building** (short, flexible, customisable training programs);
- 2) **commercial and industrial engagement** (through awards and marketing); and
- 3) **showcasing** (through trade fair exposure of made in Australia DfE products to consumers, designers, building specifiers, and construction industry).

The State of Victoria, Australia, Design for Sustainability Program

Sustainability Victoria was formed by the State of Victoria Government from its precursor, EcoRecycle Victoria and the Sustainable Energy Authority in October 2005. What began as a Zero Waste Strategy-funded waste avoidance program has evolved into a multi-program initiative with an increased emphasis on the effects along the entire value chain. The **Design for Sustainability**

(D4S)²⁴ **program** is one of these. As a state agency, and thus as neither the policy-maker nor the regulator, Sustainability Victoria's (SV) focus is on creating market "pull" mechanisms for D4S. The agency's objectives are outlined in Figure 6.

Initial conversations with designers themselves helped SV understand the *process* of design, as well as the main obstacles and barriers faced by designers to the absorption of D4S principles into their trade. These exploratory discussions established that certain individuals were ready to champion D4S, but that the commercial design world in which they worked remained disinterested.

SV thus partnered with the Design Institute of Australia (DIA) and The Centre for Design at RMIT to run an influencing campaign to promote an open forum for the legitimate discussion of D4S amongst its membership and within the design community. In order to get D4S on the agenda, the DIA developed a *Design Practice Note* which began to be distributed in its existing membership toolkit; a poster explaining the what and why of D4S; and a series of A3 factsheets called *QuickStart* covering a variety of topics including a D4S glossary and a strategy for promoting D4S to your employer. These materials and tools continue to be used in the design community and beyond.

More direct incentives for designers are provided through the awarding of small grants to individual designers and small consultancies, since the primary barrier to applying D4S principles in their work was identified by designers to be time and resource constraints. In this way, designers can afford to take the time to research and propose alternatives that stretch beyond what was asked for by the client.

Funding for the SV program itself is increasingly difficult to obtain, since there is no Australian government department specifically responsible for funding this type of work. The initial grant of \$100,000 AUD / yr awarded to EcoRecycle expires after three years. Currently, SV is thus exploring three core areas of potential partnership where the government has already voiced a public commitment: eco-labelling, an IPP (Integrated Product Policy) equivalent; and an agenda for sustainable production and consumption. It is also working with the State's \$10mil AUD initiative to build the profile of its design sector in Australia and abroad.

Further, SV is building off of its experience with D4S and applying those lessons to promoting awareness and use of life-cycle thinking. Initial work has begun with the Plastics and Chemical Industry Association and with the packaging and building process sectors, and will progress in a similar way to the work that was done with the design community. As a first step, SV funds the Sustainable Packaging Alliance, which offers roundtables for packaging and manufacturing industry players to collaborate to reduce the impact of their industrial packaging. The Alliance also develops the PIQET tool (Packaging Impact Quick Evaluation Tool).

Key Take Away Messages for B.C.

- Even with limited resources, jurisdictions can act as catalysts for change through establishing effective and innovative partnerships
- There may be opportunities to increase the effectiveness of the program by emphasizing the linkages between similar initiatives
 - In the State of Victoria, the D4S program benefited from the State's interest in profiling its design sector

²⁴ D4S is also commonly referred to as Design for Environment (DfE), and the two are seen as synonymous here.

- SV gained by engaging with stakeholders early in the target-setting process and established innovative partnerships to influence the production and consumption cycle and stimulate behaviour changes.
- In some circumstances it may be possible to increase industry buy-in by allowing the partnering industry association to take the lead. This can lead to the program being seen as industry- rather than government-driven.
- There may be an opportunity to raise awareness of B.C.'s design sector and showcase B.C. designers as cutting edge in order to help them have a greater influence on DfE
 - Diana Gibson commented that a study conducted for the State of Victoria on the influence of its designers was critical in gaining support for the D4S program
- B.C. may want to consider the risks of doing nothing. There is the risk of becoming a dumping ground for substandard products if one does not have a standard for those products for which other jurisdictions do.

KEY CHALLENGES AND BARRIERS TO PROMOTING DfE IN INDUSTRY

Public sector jurisdictions can face a number of challenges when trying to promote DfE practices in industry. Below we have captured those identified by the jurisdictional managers in the development of their programs and those observed by the international expert interviewees. These may or may not be true for B.C. or may affect them in disproportionate ways but it seemed prudent to highlight them and provide initial guidance on how these have been or could be overcome.

Interestingly when compared to those challenges and barriers identified in the 2006 Alberta report there was greater emphasis placed on setting the right standard and harmonization with other existing or future regulations than on the Province's ability to influence the market or providing tangible incentives to producers. This may in part be due to two complementing factors first the increasing interest and credibility of adopting existing standards and harmonization amongst jurisdictions and second the increasing acceptance of industry that regulations are coming and there are clear benefits to being involved in the process versus trying to delay or roadblock them.

Setting an appropriate standard – Many interviewees commented on the challenge of identifying the most effective regulatory mechanisms for inducing design changes (e.g. mandatory standards or education programs), as well as, the appropriate level of pressure to put on industry (e.g. minimum standards or timelines). Although this will always remain a challenge for regulators by engaging a wide range of stakeholders in the program development process, applying a variety of policy levers and having a clear understanding of the jurisdiction's priorities many jurisdictions have been able to at least partially overcome this. If B.C. were to pursue a strategy to encourage DfE then it would be advisable to signal this to the market and engage with stakeholders to identify the barriers they face to the integration of DfE and prioritize those areas where they can have the most influence and address their jurisdictional priorities. Further, almost all jurisdictions indicated that their program was one of many that were driving design changes in industry and that it was the combination of the different policy levers that was critical for success. Finally, a consistent message from the jurisdictional interviewees was their surprise at the over-performance of industry once the standards were set and their encouragement of B.C. to be ambitious in the setting of minimum standards. As an additional comment Naoko Tojo pointed to the importance of engaging individual companies, particularly niche firms, rather than industry associations to identify the existence of or opportunities for technological innovations.

Stakeholder Engagement – Although acknowledged by all interviewees as a critical element in the success of any program an effective stakeholder engagement program has a number of inherent challenges. These include ensuring that all participants are invested in the success of the program, asymmetric knowledge between companies, industry associations, NGOs and government, as well as, having the time and resources to manage the process. A key success factor of the EPEAT program according to Wayne Rifer was everyone's interest in seeing the initiative succeed. In this case a few key companies became involved early in the process and as it built momentum other actors became increasingly involved. Further all participants were invested in its success because they understood that some form of regulation was coming, they believed in the process (e.g. the fact that they could participate in its development) and understood that it served their interests to have a standard which was credible and all jurisdictions could respect versus one which met the lowest common denominator and would lead to multiple standards across the US. Further, by structuring

engagements in such a way that individuals have to work together to develop solutions rather than simply protecting their group's interests, constructive engagements can be achieved. For instance Wayne Rifer commented that in the EPEAT design process they did not allow individuals to go back to their interest groups for feedback on individual items which in previous efforts (i.e. NEPSI) simply stalled the process and led to groups digging in rather than working on compromises and solutions.

Asymmetric knowledge will always be a challenge but by ensuring that the right people are involved and providing enough time to capture all the existing knowledge in a clear and transparent process which is open to public comment its barrier can be reduced. As mentioned above, another important element is by engaging individual companies rather than simply industry associations it may be possible to get to a level of detail and knowledge not represented within a collective system. Finally, having a comprehensive process as adopted by the EU in the development of the EuP may be overly ambitious for B.C.'s context but there may be opportunities to leverage existing studies to deepen the understanding of a product category's impacts and tradeoffs.

In terms of resources required to develop a standard through a comprehensive stakeholder process it was clear that it was a substantial investment of both time and resources. In Minnesota it took close to 6 years to come to a consensus for the Electronics Recycling Act and the EPEAT development process engaged 65 people in the initial development team and another 95 in the balloting group. For further insight the EPEAT stakeholder engagement process cost the EPA close to \$375,000USD over 3 years, which was contracted to the Zero Waste Alliance and managed by Wayne Rifer.

Ability to influence the market – As was found in the Alberta study most interviewees commented on the challenge of influencing the market when located in a relatively small jurisdiction. Many questioned why a company would redesign its product to meet more stringent requirements in one jurisdiction when it only accounts for a very small percentage of its sales. The relatively small size of a Provincial or Canadian market for products increasingly designed for continental or global markets also poses a barrier, especially when many products are designed outside of Canada. Others noted Provinces are limited in their legal authority to force producers to meet certain requirements if they exist outside of the Province and must often resort to regulating first sellers.²⁵ Further Diana Gibson commented that design is nebulous making it difficult to force in one direction or another. Despite these challenges this report highlights the efforts of small markets, Minnesota and State of Victoria, as examples of how these have been overcome. These have been particularly successful by adopting or aligning their standards with leading global standards.

Lack of direct customer demand – There is not always a clear market driver or business case for producers to do DfE. Producers are more likely to go with the lowest cost option and supply whatever consumers are demanding. Without a demand for greener or more sustainable products, producers are less likely to put those types of products on the market. Government can do more to educate consumers about making more sustainable choices at the point of purchase and set a leadership example with their own public procurement. Government should consider making a long-term internal commitment to sustainable purchasing and then provide the resources necessary to develop skills in life cycle management and total costing, and to cover premiums on more sustainable products. Collaborating with other jurisdictions to develop a consistent procurement strategy and to educate consumers will help to enhance overall customer demand.

²⁵ Personal Interviews with Derek Stephenson, Stewardship Ontario. October 2005. Challenge was also noted by Alberta Environment in comments on Draft Report.

Producers' lack of trust in government – It can be challenging to get industry to see government-led regulatory or voluntary programs as an opportunity instead of threat.²⁶ Involving actors from across the value chain early in the development of the program was suggested as a way to overcome this issue with regulatory programs (i.e., product panel). On the voluntary side, some governments have tried to position themselves as a center of excellence who help companies find solutions and realize technical innovations (e.g., State of Victoria, UK WRAP Program, US EPA DfE Program).

Working together with other jurisdictions – Interviewees noted that at a given time, each jurisdiction has different specific priorities in their environment program and limited funding for those priorities. However, there are often synergies amongst them that could lead to a better use of resources by collaborating with other jurisdictions or adopting existing standards and B.C. was strongly encouraged to do so.

Moving from collective systems to individual responsibility – Governments tend to adopt collective systems where all producers pay into one pot to manage the waste associated with a certain product group. The terms of collective systems are often easier to negotiate among all the players and are also easier to administer and monitor; however, there is rarely an incentive for DfE in a collective system. In many product categories there is a divide in the industry itself with some calling for individual responsibility, usually leaders in the area of DfE, while others call for collective responsibility. One opportunity to move towards individual responsibility is to engage with proactive companies that tend to prefer this over collective responsibility as they see it as a potential competitive advantage.

Providing tangible incentives for producers – Applying taxes, charges or fees based on product or material types and other environmentally preferable attributes is a difficult task. Introducing new taxes can be unpopular with some industry sectors, and internalizing external costs is a relatively new undertaking for industry and government. Governments have also come under fire for showing preferential treatment to one industry over another, which makes them reluctant to adopt taxes and charges for a specific product or packaging category. As demonstrated by the US Executive Order and Japan's Top Runner program there are other ways to provide incentives to businesses to adopt DfE. Although they clearly require a baseline mandatory standard these programs demonstrate the potential effectiveness of pull incentives.

²⁶ Personal Interview with Mark Barthel, Director UKs WRAP Program. October 2005.

V. BEST PRACTICES FOR PROMOTING DfE IN INDUSTRY

Below we outline a series of recommendations B.C. may want to consider if it chooses to pursue a policy of promoting DfE in industry. These are based on the interviews conducted for this study, information from the 2006 Alberta report, OECD's principles for effective EPR programs and are also informed by the research team's experience with other product stewardship and DfE programs.

Recommendations for effectively stimulating DfE and product stewardship activity:

- i. Provide a **clear policy or statement of intent** to promote design changes that will improve environmental outcomes across the life cycle;
- ii. Develop a **flexible policy approach that focuses on results** rather than the means of achieving them;
- iii. Provide **incentives for producers to increase their share of the responsibility for managing their product throughout its life cycle** (physically and/or economically, fully or partially) and to take environmental performance considerations into account upstream at the design phase;
- iv. Provide **incentives for consumers to choose products or packaging** with better environmental performance over the life cycle;
- v. Involve **stakeholders that represent the full product value chain** (or life cycle), including suppliers, producers, retailers, consumers etc. in the development and regular evaluation of stewardship programs that incorporate DfE as a policy objective;
- vi. When designing programs it is best if they **incorporate continual improvement, clear baselines, target-setting related to DfE, and instructions for monitoring and enforcement**;
- vii. Develop **Provincial product category priorities and a clear step-by-step process for program development** (e.g. start with stakeholder engagement, establish minimum mandatory standards, create effective incentives etc.) to allow the province to respond opportunistically to new scenarios;
- viii. Identify and adopt **applicable and leading existing standards** rather than developing unique solutions or proprietary standards; and
- ix. Where possible **Act as a catalyst** to reduce barriers to DfE.

In the following tables we provide additional information on each of these recommendations including a description of the best practice; how it could be adopted in B.C.; a sample activity, and highlights from the jurisdictions reviewed (these include relevant lessons from the 2006 Alberta Report).

i) Policy or clear statement of intent

Description

A clear policy or statement of intent is critical to advancing any strategic objective. This is also true when it comes to governments who want to promote design for environment activities among industry. Stakeholders in some jurisdictions including companies and the public feel government has a key role in encouraging DfE activities among industry and stimulating a market for more sustainable products and technologies. Therefore the policy statement or objectives for the Province's waste stewardship programs should reflect life cycle thinking and stipulate "the promotion of DfE" as a key objective. In absence of a high-level policy commitment on DfE, it is likely that little progress can be made towards targets on waste prevention and life cycle impacts of products. Further, it will be important to communicate to industry that B.C. will be moving in this direction to encourage them to participate in its design and development through stakeholder engagement processes.

How it could be adopted in B.C.

- If B.C.'s Ministry of Environment decides to pursue a program to encourage DfE as a first step they should consider communicating this intent to all stakeholders. This would be the first step in encouraging stakeholder engagement in the process and provide a clear direction for all future Ministerial policy directions.
- *Sample Action: host a series of presentations on DfE, what it is, why it is important, why the government wants to pursue it, what their objectives are, and the process B.C. will take to define its program and approach.*

Highlights from Programs in other Jurisdictions

Minnesota's Product Stewardship Program - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- In 1999, the then Minnesota Office of Environmental Assistance (OEA), adopted the first product stewardship policy in the United States.
- The principles of the policy were clearly communicated from the outset:
 - Ensure all involved in producing, selling and using of products are responsible for the full environmental impact of the product.
 - **Provide direction to producers to examine products from a life cycle perspective.**
 - **Reduce or eliminate the amount and toxicity of waste from products and use materials, energy and water efficiently at every stage of a product's life.**
 - Increase recycling and recovery rates upon disposal of products.
 - Incorporate cost of end of life into the cost of producing a product so that producers and users are paying up front for proper management of waste products. This provides incentives for making end of life management cheaper by **making changes in product design**

Germany's Green Dot Packaging Legislation - <http://www.gruener-punkt.de/?L=1>

- Germany was among the first to institute a comprehensive approach intended to promote redesign. The Ordinance on the Avoidance and Recovery of Packaging Waste, in short the Packaging Ordinance, came into force in Germany on 12 June 1991. It places a legal obligation on trade and industry to take back and recycle transport, secondary and sales packaging.
- It sets a clear hierarchy for handling packaging waste. The first and foremost policy objective is "**packaging waste must be prevented or reduced**". Secondly, used packaging is to be re-used or recycled by returning it to the production loop. Only packaging waste which cannot be prevented, re-used or recycled may be disposed of by means of incineration or landfilling.
- Producers in Germany responded to the new law by establishing a non-profit organizations (Duales System Deutschland AG) that created and licensed a logo for participating producers to put on their products. The collection and recycling system for packaging is paid for by the companies that use the logo.

UK WRAP Retail Innovation Program - http://www.wrap.org.uk/retail/about_us/index.html

- Linked policy objectives to EU Landfill Directive (UK has to comply with the terms under this Directive). Recognized increases in recycling rates and composting would help to achieve UK compliance with Directive, however also felt a

i) Policy or clear statement of intent

combination of sustainable design practice and waste management thinking was necessary to effectively address sustainable consumption and production.

- UK strategy to meet EU Landfill Directive includes five policy objectives; one is focused on DfE, to **"Reduce the production of household waste by consumers, particularly the amount of packaging and food they throw away"**. The Retail Innovation Program was developed in response to this objective.

ii) Policy approach that focuses on results rather than means of achieving them**Description**

Governments need to decide early on in program development whether they want to take a top-down (more prescriptive) or bottom-up strategic approach (more open and general). By focussing on clear targets and providing industry with the opportunity to develop individual strategies for how best to achieve them provides industry with the flexibility to develop approaches most suited to their circumstances while still achieving the regulation's aims. This is the approach which was adopted in Minnesota's MPCA and Japan's Top Runner program with a great deal of success.

How it could be adopted in B.C.

- When establishing new regulations the Ministry may want to take the approach of focussing on setting objectives as its primary role. It could then play a facilitator and monitor role to assist and ensure that companies have good plans in place to achieve the objectives while not being prescriptive in how these should look.
- An important consideration here is that this approach requires a clear process for accountability and sufficient consequences to ensure individual companies are motivated to meet the objectives.
- *Sample Activity: Establish clear targets (e.g. recover 60% of last years sales in electronics equipment) and structure the monitoring process on a company by company basis rather than on an industry basis*

Highlights from Programs in other Jurisdictions*Electronic Product Environmental Assessment Tool (EPEAT) - <http://www.epeat.net/>*

- EPEAT is a label and procurement tool developed through multi-stakeholder consensus to help purchasers in the public and private sectors evaluate, compare and select desktop computers, laptops and monitors based on their environmental attributes.
- EPEAT evaluates electronic products according to three tiers of environmental performance – Bronze, Silver and Gold.
- To qualify as an EPEAT product, it must conform to all the mandatory attributes corresponding to Bronze certification. **Producers may pick and choose from amongst the additional optional attributes** to boost their EPEAT baseline "score" to achieve Silver or Gold.

Minnesota's Product Stewardship Program - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- The MPCA develops product-specific policy and also employs voluntary initiatives to promote and pursue product stewardship objectives.
- Their **measures are often non-prescriptive, with industry and manufacturers at times even coming up with their own proprietary methods for meeting targets** or initiating new programs

Japan Top Runner Program - http://www.eccj.or.jp/top_runner/img/32.pdf

- Once the target value for a target product has been set the target year by which producers must meet the standard is defined. There are no interim evaluations or progress reporting built into the program for the meantime, and **the methods and timing of implementation are left completely up to the manufacturers.**

ii) Policy approach that focuses on results rather than means of achieving them

European Union Energy Using Products (EuP) Directive –

<http://www.euractiv.com/en/energy-efficiency/eco-design-requirements-energy-products-eup/article-117467>

- The EuP Directive does not introduce directly binding requirements for specific products, but rather defines the conditions and criteria for setting, through subsequent implementing measures, requirements regarding environmentally relevant product characteristics (such as energy consumption).
- **The Directive allows for flexibility in the chosen method of implementation by each member state.**
- The Directive also gives preference to alternative courses of actions such as self-regulation by industry where such actions are likely to deliver the policy objective faster or cheaper than mandatory requirements.

iii) Incentives for Producers

Description

To stimulate DfE within producers they will need to be motivated in one of two ways either by cost savings or increased sales.

Cost savings typically come in the form of avoiding fines imposed for not meeting government requirements. In this case it is critically important that individual producers bear the direct financial and/or physical responsibility for managing or reducing product wastes. The assumption is if producers recycle and dispose of their discarded products, or pay for someone to recycle and dispose of the products, they will have direct incentives to account for these costs in decisions about design and marketing. This is in sharp contrast to collective responsibility systems where the benefits (i.e. cost savings) from investments in reducing one's own waste are diluted by the shared responsibility.

Increased sales are the other way of stimulating DfE within producers. There are a number of levers governments can pull to achieve this from reducing access to markets (i.e. market bans) to preferential government procurement for certain products to awards and recognition for exceptional product performance.

Both of these approaches support the business case within companies when they consider the rational cost benefit analysis of investing in DfE.

How it could be adopted in B.C.

- Given the size of the B.C. market there may be limited opportunities to sufficiently motivate companies to redesign their products due to fines or cost avoidance, as companies may choose to simply avoid the B.C. marketplace rather than take on additional responsibilities
- When designing new programs B.C. should consider structuring policy to ensure that individual companies are responsible for their waste rather than being forced into a collective responsibility system
- Given its size there may be more opportunities for B.C. to encourage DfE through the increased sales end of the spectrum. Potential activities in this area include: government procurement programs for approved products (ideally through an existing qualification program such as EPEAT); increasing customer demand for preferential products (see item iv below); providing awards and recognition for exceptional products (see Top Runner example below); and finally by reducing the barriers to DfE within companies by acting as a catalyst for design changes (see item ix below). Another emerging area of activity is technological procurement which is the setting of ambitious targets for industry with a guaranteed market if they are successful.
- *Sample Activity: B.C. could establish a government procurement program which preferentially selects products that meet the EPEAT standard and share their lessons from the process with other major procurement departments in the province (e.g. forestry companies).*

Highlights from Programs in other Jurisdictions

State of Victoria, Design for Sustainability Program - <http://www.sustainability.vic.gov.au/>

- Direct incentives for designers are provided through the awarding of **small grants to individual designers and small consultancies** in order to pay for time spent researching and proposing alternative design for environment options that can be offered as alternatives that stretch beyond what clients asked for in their product design.

iii) Incentives for Producers

UK WRAP Retail Innovation Program - http://www.wrap.org.uk/retail/about_us/index.html

- WRAP provides retailers, brand owners and suppliers with **technical support and “best in class” data on reducing packaging weight** (subsequently reducing production and transport costs).
- WRAP **funds retailer-led or brand-led research and development, trials and demonstration projects** to mitigate risks associated with introducing new products or packaging concepts (via Innovation Fund of £8 million, or \$16 million CAD).
- WRAP received 75 pilot project proposals, which lead to 18 approved projects, £2.46 million assigned and an estimated best-case reduction of 350,000 tonnes of packaging waste (investment of £7.44/tonne).

Electronic Product Environmental Assessment Tool (EPEAT) - <http://www.epeat.net/>

- Producer incentives for improvement of product design for environment are inherent in the competition for points in the three tier classification: while bronze products meet only the required criteria, producers that go beyond the minimum standard are rewarded with silver or gold designations.
- Highly visible tool for purchasers when searching the online database.

Japan Top Runner Program - http://www.eccj.or.jp/top_runner/img/32.pdf

- Exceptional products can receive labels such as “2008 Energy Award Winner” which is perceived as valuable and pursued by manufacturers.²⁷

iv) Incentives for Consumers

Description

The “pull” for products with superior environmental performance across the life cycle can be as important as the push. Demand from customers creates a conventional incentive producers understand and respond to via innovation and competition. To better inform customers, mechanisms that draw their attention to the non-monetary consequences of a purchasing choice are needed. These include information about a product's environmental impacts, instructions on product use and disposal, fees or charges levied at the time of disposal (which provide incentives to buy fewer and more durable products, but also provide the customer with the incentive to illegally dump the product to avoid the fee), and advanced disposal fees (which provide customers with incentives to buy fewer and more durable products).

How it could be adopted in B.C.

- There may be opportunities for B.C. to support customer education through various initiatives which would increase the ‘pull’ of the market and encourage DfE. Examples of this include:
 - awards recognising exceptional performance (e.g. Japan Top Runner program's Leading Products award);
 - providing or supporting the development or use of rating schemes such as the Energy Star program or Eco-Logo;
 - working with retailers to promote preferential products (there may be a lot of interest in this at the moment due to retailer interest in going beyond simply the provision of products to becoming knowledge sources for their customers); or
 - Adopting (or developing replicable) logical and simple labels for specific issues that are of interest to the province (e.g. this was done in the Netherlands with a “Do Not Throw Out” label for batteries which was extended to the rest of Europe.)
- *Sample Activity: work with Save-On-Foods, Safeway and Thrifty's to develop in store education programs around making environmentally preferable choices.*

²⁷ Personal Communications, Naoko Tojo, September 23, 2008

iv) Incentives for Consumers

Highlights from Programs in other Jurisdictions

Japan Top Runner Program - http://www.eccj.or.jp/top_runner/img/32.pdf

- Producers are required to provide consumers with **information on the energy efficiency** of their product in an eco-catalogue available at retail shops. Additionally, producers can opt to augment this with a **voluntary label** – a green or red “e” symbol affixed to their product shows the percent of conformity with the standard.
- Consumers are offered two tiers of **tax reduction incentives when purchasing cars** whose emissions are >25% and >50% over the standard, respectively.

European Union Energy Using Products –

<http://www.euractiv.com/en/energy-efficiency/eco-design-requirements-energy-products-eup/article-117467>

- Under the EuP Directive, products covered by the Directive for which eco-labels already exist are presumed compliant with the implementing measures, in so far as the eco-label meets the requirements of the implementing measure. **Eco-labels indicate to consumers which products are deemed environmentally preferable.**

State of Victoria Design for Sustainability Program - <http://www.sustainability.vic.gov.au/>

- The factsheets, posters and other materials developed initially for designers, are being requested by other sectors for consumer educational and marketing purposes.

Electronic Product Environmental Assessment Tool (EPEAT) - <http://www.epeat.net/>

- EPEAT-certified products can be compared in an online database in order to help in purchasing decision-making for environmentally conscious consumers.

v) Involvement of actors along the product value chain

Description

Involving key actors along the product value chain is an important criteria for successful design for environment programs for two reasons:

- 1) Involving players from across the life cycle including upstream and downstream business partners can help to identify opportunities for DfE that might not have been visible if you only considered gate-to-gate environmental and social factors. Without involving suppliers and customers you are missing out on much of the life cycle.
- 2) The involvement of stakeholders also adds accountability and credibility to any program. Inclusion of NGOs, consumer interest groups, research and academia ensure that industry and government are held accountable, and can also add value to the program by raising new ideas and potential design solutions. The Director General for the European Union has identified stakeholder engagement as a key element of effective DfE.

How it could be adopted in B.C.

v) Involvement of actors along the product value chain

- Develop or build off of existing stakeholder engagement processes to engage industry, NGOs, academia and the public in the design and development of an effective DfE strategy.
- As a starting point meeting with progressive firms that are interested in differentiating themselves in the marketplace because of DfE may help to identify key starting points and build credibility and momentum for a wider stakeholder engagement process.
- *Sample Activity: Once the objective of the Province's DfE strategy is clearly defined host a series of stakeholder meetings to bring the key individuals together to discuss the most effective way of achieving the aim. A critical lesson from the jurisdictional experts we spoke with was to include NGOs for credibility and structure the discussions around finding solutions through compromise rather than representing specific industry interests. For the EPEAT negotiations this was achieved by keeping everyone in the room rather than allowing associations to go back to their members for feedback on individual items.*

Highlights from Programs in other Jurisdictions

Electronic Product Environmental Assessment Tool (EPEAT) - <http://www.epeat.net/>

- EPEAT was developed completely through a multi-stakeholder consensus decision-making process.
- A Board of Advisors comprised of a representative mix of the stakeholder groups sets policy for the program

Japan Top Runner Program - http://www.eccj.or.jp/top_runner/img/32.pdf

- The Program is mandatory but manages to remain "inclusive and consensus-oriented."
- Decision-making is based on a broad consultative process including three committee levels that are each informed by working groups. **The committees consist of experts, academia, consumer groups, and local government and industry representatives** who define which products to include, the content of the standard, and the target years.
 - According to Nordqvist a critical success factor for the Top Runner program was the engagement of industry in the target-setting process. One lesson Naoko Tojo pointed to was the importance of engaging individual companies rather than industry associations to uncover what is really possible and may already be being done versus a standard that the industry as a whole is comfortable accepting.

Minnesota's Product Stewardship Program - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- The main aims of the MPCA are to increase the degree of accountability of producers and extend their responsibility for their product upstream in the value chain.
- This is achieved through voluntary efforts and initiatives that include setting up **task forces, organizing outreach activities, demonstration products and workgroups on specific priority products for various stakeholders**. Participants include representatives from producers, retailers, local governments, and non-governmental organizations (NGOs).

Germany's Green Dot Packaging Legislation - <http://www.gruener-punkt.de/?L=1>

- Duales System Deutschland AG **cooperates with many different actors along the value chain during program implementation**, including fillers, importers, packaging producers, local and international authorities.

Stewardship Ontario - <http://www.stewardshipontario.ca/corporate/index.html>

- **The Ministry of the Environment wanted their program to incorporate a multi-stakeholder approach.**
- Their Board consists of industry representatives, municipal and provincial government representatives, and NGOs.
- An important element of the program is transparency – majority of meetings and webcasts are open to the public – Ministry of the Environment sees this as key to good governance.

vi) Continual improvement, clear baselines, setting targets related to DfE, and communicating how it will be monitored and enforced

Description

In program design a number of factors emerged as best practice among the jurisdictions reviewed and experts interviewed. These were establishing a clear baseline of mandatory performance, communicating how those would be monitored and enforced (without, as mentioned above, dictating how companies should reach them), encouraging a market mechanism to recognize performance which goes above and beyond the baseline, and finally incorporating the concept of continual improvement into the program structure.

All interviewees emphasized the importance of mandatory standards to push industry to improve and ensure that leaders are not undercut in the market by competitors underperforming in the environmental space. Even in the case of voluntary initiatives such as the State of Victoria the experts commented on the importance having the push aspect as a context for the pull initiatives. Further these baselines provide business with a clear marker of future expectations and are the only guaranteed level of performance which may be important in meeting Provincial objectives. When setting baselines it is critical that the form of measurement and the method of enforcement are also communicated.

By establishing a reward mechanism which leverages market drivers for those companies who go beyond the baseline additional benefits can be generated by the program. (See Providing incentives to producers above for additional guidance.) Interestingly these do not have to be direct benefits but can be effective if they can spark competition amongst companies. This can be through a scoring system or awards for exceptional performance. Both have proved to be successful in the EPEAT and Top Runner systems respectively.

Finally, when establishing programs it is important to incorporate the concept of continual improvement into the program design to ensure that companies are continually encouraged to innovate rather than to become complacent once the baseline is achieved. Further, as was commented on by expert interviewees by establishing the signals that criteria will become increasingly stringent, as with making a clear policy commitment to DfE, companies are encouraged to invest in DfE due to expectations of future regulations.

How it could be adopted in B.C.

- When designing new programs or strategies B.C. should consider applying these concepts as much as possible. In particular incorporating continual improvement criteria and developing an effective market mechanism to encourage performance above and beyond the baseline has the potential to encourage DfE activities.
- *Sample Activity: Review other approaches to encouraging competition amongst companies and incorporate into future program design.*

vi) Continual improvement, clear baselines, setting targets related to DfE, and communicating how it will be monitored and enforced

Highlights from Programs in other Jurisdictions

Minnesota Product Stewardship Program - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- In the *Electronics Recycling Demonstration Project* (under electronics stewardship program), OEA, Sony Electronics, Panasonic-Matsushita, Waste Management's Asset Recovery Group and the American Plastics Council formed a partnership in 1999 to jointly fund and conduct a state-wide electronics collection and recycling project. The project tested a product stewardship framework for managing old consumer electronics (5 year commitment).

Germany's Green Dot Packaging Legislation - <http://www.gruener-punkt.de/?L=1>

- As the organizer of waste separation and recycling in Germany, Duales System Deutschland AG must ensure the program meets the law and collection and recovery targets. In their function as the competent supervisory authority, it is up to the environment ministries of the federal states to ensure that these targets are met.
- The instrument **used to ensure the program meets its targets is the mass flow verification**, which acts as a "performance record" and documents the collection and recovery performance of the company.
- Over and above the requirements of the Packaging Ordinance, the company has also been **publishing a voluntary environmental performance balance** since the year 2000, which expresses the actual savings in primary energy and CO2 emissions in concrete figures.

Japan Top Runner Program - http://www.eccj.or.jp/top_runner/img/32.pdf

- The "Top Runner" approach **uses, as a base value, the value of a product with the highest energy consumption efficiency on the market at the time of the standard establishment process, and sets standard values by considering the potential technological improvements. This base value is raised continually over time.**
 - A critical aspect of the Top Runner program's success was setting a clear and mandatory standard which companies could pursue, without dictating how they should achieve it. This provided industry with incentives to improve their products with a clear baseline of performance while encouraging competition amongst them to go beyond this. The incentives included the market, awards for exceptional performance, as well as government procurement and tax incentives for consumers which use the Top Runner criteria as a guide.
- The Top Runner program has a built-in mechanism for continuous improvement
- Once the target year has been reached, programs are re-evaluated and more stringent targets can be set into place after revisions. As a general rule, the time frame to reach the next target year becomes shorter than the first.
- Enforcement is addressed through a "name-and-shame" approach, which has shown to be more successful for Japanese producers than for international companies operating in Japan.

vii) Provincial priorities and a clear process

Description

A consistent theme amongst the jurisdictions reviewed for this study was being opportunistic in terms of adding new product categories when the industries, specific producers or public interest allowed. In order to do this successfully and effectively it is first important to know which product categories a jurisdiction is interested in focussing on so that they can operate strategically. Further by having a clear and effective process for incorporating new product categories into existing regulations a jurisdiction can respond quickly to opportunities as they emerge.

How it could be adopted in B.C.

- Most likely the existing list of targeted product categories and the criteria for identifying these would suffice as the initial list of priorities. However, it may be worth reviewing these with additional considerations for opportunities for DfE rather than their impacts at end of life (e.g. Fast Moving Consumer Packaged Goods are continually being redesigned while others such as gypsum board may have fewer opportunities for redesign).
- Formalizing a process for integrating product categories into DfE programs will likely take time and build off of the Province's experience. However, this can be accelerated by learning from the jurisdictions reviewed here and the processes they have used (e.g. MPCA's product stewardship framework).
- *Sample Activity: Review existing priority product categories considering opportunities for design changes and influence and review existing processes to learn from and adopt applicable aspects.*

Highlights from Programs in other Jurisdictions

Energy Using Product (EuP) Directive –

<http://www.euractiv.com/en/energy-efficiency/eco-design-requirements-energy-products-eup/article-117467>

- The EuP Directive's Methodology for Preparatory Studies outlines the step-by-step process leading up to and informing the writing of implementing measures.
 - Task 1 – Product Definition
 - Task 2 – Economic Analysis
 - Task 3 – Consumer Perspective
 - Task 4 – Technical Analysis Existing Products
 - Task 5 – Base Case And Environmental Assessment
 - Task 6 – Technical Analysis Of Best Available Technology (Bat)
 - Task 7 – Improvement Potential
 - Task 8 – Scenario Analysis

Minnesota Product Stewardship Framework - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- This generic framework is versatile enough to have the ability to respond to interest from industry to use product stewardship in emerging product categories
- The framework is easily transferable: the states of California, Oregon, and Washington are adopting similar frameworks

viii) Adopt leading existing standards (Harmonisation)

Description

A consistent and emphatic message from all interviewees was to adopt existing standards and solutions wherever possible rather than developing new ones. The justification for this is fourfold. First, it reduces the effort required by the jurisdiction if an existing standard can be adopted or adapted to their needs. Second, there is a clear risk of a backlash from industry who are facing a wide diversity of standards and regulations in an increasingly global market. Given B.C.'s size a unique solution may simply lead to firms leaving the province rather than adapting their design behaviour. Third, there are sufficient quality standards out there that have gone through comprehensive stakeholder evaluation and development processes that there is little benefit to developing new ones tailored to a specific market. Finally, there is a risk, especially for smaller markets, that adopting standards which are not harmonised will lead to the market becoming a dumping ground for products which are blocked by other broadly accepted standards. For example, if RoHS becomes the widely accepted standard in the Pacific Rim and B.C. were not to adopt it – it may quickly become a dumping ground for those products having a negative impact on B.C.'s product mix.

How it could be adopted in B.C.

- As a first step representatives of B.C.'s Ministry of Environment should become familiar with existing policy approaches and if possible deepen this awareness through networking and participation in relevant industry groups and conferences.
 - Potential conferences to consider include: Conference on Canadian Stewardship - <http://www.canadianstewardship.com/2007/aboutus.html> ; Product Stewardship Institute - <http://www.productstewardship.us/> ; Electronics Product Stewardship Canada - <http://www.epsc.ca/> ; Extended Producer Responsibility Workshop <http://www.nbeia.nb.ca/EPR/0001-e.html> etc.)
- *Sample Activity: As recommended in the path forward below it may serve B.C.'s interests to host a conference of those individuals interviewed for this project as well as other experts to gain additional insights from them and work to identify opportunities for collaboration and harmonization of efforts.*

Highlights from Programs in other Jurisdictions

Minnesota Pollution Control Agency (MPCA) - <http://www.pca.state.mn.us/oea/stewardship/index.cfm>

- The MPCA's **Product Stewardship framework** is being adopted by the states of California, Oregon and Washington
- MPCA also uses the RoHS standard as a basis for the materials companies need to report on. (This demonstrates using an existing standard but in a unique way.)

California Electronic Waste Recycling Act - <http://www.ciwmb.ca.gov/electronics/Act2003/>

- The Act has been amended to include the European RoHS Directive 2002/95/EC (Restriction on Hazardous Substances), which restricts the use of six hazardous materials in the manufacture of a wide range of electronics and electrical goods
- Further, RoHS-similar regulations came into effect in China in 2007, in Korea in 2008, and other countries such as Canada and Japan are also considering its adoption.

Electronic Product Environmental Assessment Tool (EPEAT) - <http://www.epeat.net/>

- There is no restrictions for international manufacturers wanting to register their products
- SME products' registration is encouraged through sliding scale registration for producers with a smaller annual sales volume
- **EPEAT has found uptake worldwide** – all kinds of jurisdictions are increasingly using the EPEAT standard including the UK, European countries, Brazil, New Zealand, and Mexico City

ix) Act as a catalyst to reduce barriers to DfE.**Description**

As clearly demonstrated by the State of Victoria Design for Sustainability program's success the barriers to DfE are not limited to incentives, but also include knowledge gaps and stigmas amongst designers themselves. By identifying these additional barriers and working to reduce them or assist companies in overcoming them government can play an important role in encouraging DfE. Further, particularly in the case of B.C. its design influence may be dramatically higher than its industrial base and by focussing on this it may be able to affect the design and performance of products around the world (including those produced outside of B.C. and imported).

How it could be adopted in B.C.

- An initial step would be to engage designers in B.C. to identify the hurdles they face in incorporating DfE into their activities and developing strategies to reduce those.
- *Sample Activity: Partner with the B.C. Ministry of Technology, Trade and Development to undertake a study on the global impact of designers in B.C.. (This was noted by Diana Gibson as an important element in getting support for the State of Victoria's design for sustainability program.)*
- *Sample Activity: Work with B.C.IT and the Emily Carr Institute on education programs to encourage DfE in their design curriculum, providing future designers with a grounding in its basic concepts and justification.*

Highlights from Programs in other Jurisdictions

State of Victoria Design for Sustainability Program - <http://www.sustainability.vic.gov.au/>

- The factsheets, posters and other materials developed for designers have helped to reduce the barriers to DfE.

VI. POTENTIAL AMENDMENTS TO THE B.C. RECYCLING REGULATION

Based on the findings of this study the authors have identified a number of considerations for BC in any adjustments to the Recycling Regulation. Where these are in place B.C. is encouraged to continually pursue them and, where opportunities exist, to deepen them. New approaches will require more analysis to determine their feasibility and potential impact on desired outcomes, ideally this will be done through a stakeholder engagement process.

- Best practice from the reviewed jurisdictions indicates that an outcome based approach which explicitly states the expected performance level, method of measurement of performance, method of enforcement, and the consequences of not meeting the targets or requirements is most effective.
 - This has the potential to reduce the regulatory complexity and simplify monitoring for B.C. and allows companies to optimize the system to achieve the objective. This can be particularly effective if a market mechanism is established to reward companies that exceed the baseline requirements (e.g. can carry over or sell credits or are acknowledged publicly for exceptional performance)
 - For an example of this see the State of Minnesota case study
 - Part 2 Section 5 (1) (c) (iii) “reasonable and *free* consumer access to collection facilities” could be made more flexible, thereby potentially creating an income stream from disposal for producers (and encouraging better design for disassembly).
 - This would only be feasible when backed up by strong and enforceable regulation.
- Best practice from the reviewed jurisdictions indicates that BC could consider incorporating mechanisms for the continual improvement of products into the Recycling Regulation.
 - For example, a continual improvement aspect could be added into the target outlined in Part 2 Section 5 (1) (a) (i). Such an aspect would have to be carefully defined to pursue the optimum rate for each particular product category to avoid creating unintended collection system impacts. Best practice in this area is the Japan Top Runner which has a clearly articulated target which is regularly updated.
 - The effect of a target designed for continual improvement, up to the optimum level is to drive continuous innovation within producers versus a static target system where once a target is achieved there is no incentive for improved design.
 - The demonstration of continual improvement targets or the continuous improvement of product design for environmental performance could also be added as a criteria for plan approval in Part 2 Section 5 (2).
 - B.C. may want to consider adapting the Japan Top Runner approach to determining appropriate targets by engaging stakeholders to identify what is possible and what is reasonable.

- B.C. may want to review the other product categories being pursued by the jurisdictions reviewed in this report as they may be indicative of which product categories to consider adding to the Recycling Regulation in the future. Particular emphasis should be placed on developing the criteria using the stakeholder engagement models described in this report. Adopting new product categories based on the other jurisdictions' existing criteria may reduce the burden on producers due to alignment across jurisdictions, and may also require less policy development effort from B.C..
- A number of interviewees for this report commented on the importance of having a comprehensive stakeholder engagement process to provide the guidance needed to incorporate the variety of considerations needed to have effective product stewardship plans. Part 2 Section 5 (1) (b) – Clearly define what stakeholder means exactly this may be best addressed in definitions section.
- Where possible, B.C. may want to consider incorporating or adapting existing regulations such as the European RoHS directive, EPEAT criteria or EU EuP.
 - The RoHS directive could potentially be adopted as is or, as in the case of Minnesota, be used as a starting point by requiring producers to report on RoHS substances in their products.
- Finally, B.C. may want to consider engaging stakeholders to investigate whether this regulation is the best vehicle for addressing design incentives. As it is currently written it is targeted towards minimizing waste to landfill rather than optimizing the product's performance across its entire life cycle.
 - Encouraging design for environment may require strong amendments to the existing regulation, a new regulation, strong pull incentives, or a combination of the above.

There are also a few wording changes that B.C. may want to consider amending, as well, to encourage Design for Environment or to make it more explicit.

- Part 2 Section 5 (1)(c)(iv) add
 - (d) – operation in use phase in a safe and environmentally sound manner
 - This is also in Part 3 Section 10 (1)(a) “the safe and environmentally sound use and storage of the products”
- Part 2 Section 5 (1)(c)(vii) – “Determining (e.g. through Life Cycle analysis or other quantitative analytical approaches), and eliminating or reducing (e.g. through DfE approaches) the environmental impacts of a product throughout the products LC
- Part 3 Section 16 Offences – could be made more explicit in terms of specific penalties, method of enforcement, etc.

VII. RECOMMENDED PATH FORWARD

Based on the series of expert interviews, jurisdictions reviewed and Five Winds experience and expertise working with other organisations to incorporate DfE it appears that B.C. could have a positive influence on the adoption of DfE in industry, both in and outside of the province. To achieve that the project team has developed the following recommendations of a logical path forward for B.C., should the Ministry chose to pursue a DfE stimulation program.

- 1) As an initial step it would be advisable for the Ministry to define the objective of a DfE stimulation program (e.g. reduce the use of specific chemicals, improve design within its sphere of influence, etc.) and articulate this objective, the Ministry's intention to pursue it and process for developing specific criteria widely;
- 2) Initiate a stakeholder engagement program including the entire value chain, NGOs and the public to identify the most effective way of achieving the Ministry's objectives;
- 3) Simultaneously engage with the individuals interviewed for this study and others (possibly through a conference hosted by B.C.) to encourage further sharing of best practices and work to identify opportunities for collaboration and harmonization of efforts. A second objective of this effort would be to identify those programs which could be adopted in B.C. to encourage DfE. These might include EPEAT for government procurement and building off of the work already done in the State of Victoria for their design for sustainability program. (Ideally the identification of programs would be done in collaboration with the stakeholder groups.)
- 4) As programs are developed define the Ministry's process and priority product categories (considering opportunities to incorporate DfE versus simply their impact at end of life). The process should build off of lessons learned from other jurisdictions and existing processes and approaches.

This path forward is clearly an ideal scenario and would need to be contextualized within B.C.'s current policy climate and objectives.

APPENDIX 1: PUBLIC SECTOR JURISDICTIONS INTERVIEWED

The following individuals from leading public sector jurisdictions were interviewed.

Name	Organization
Diana Gibson	Manager, Sustainable Products and Services Sustainability Victoria
Garth Hickie	Product Stewardship Team Leader Minnesota Office of Environmental Assistance
Holly Elwood	Jurisdiction Expert US EPA
Wayne Rifer	Stakeholder Process Manager Green Electronics Council
Dr. Constantin Hermann	PE International Support for EuP Directive

APPENDIX 2: PUBLIC SECTOR JURISDICTION INTERVIEW QUESTIONS

Interviews with leading public sector organizations

Our Project Team is currently working on behalf of British Columbia's Ministry of Environment to assess design for environment (DfE) opportunities in relation to the province's existing Recycling Regulations. The results of the assessment will help British Columbia to continually improve its policies and programs through an improved understanding of the alignment, relevance, opportunities and barriers to integrating DfE and other stewardship approaches.

In order to identify opportunities for improving upon their current stewardship practices, we are hoping to learn about challenges and opportunities other jurisdictions have realized by incorporating DfE principles and incentives into existing waste stewardship programs. To gain this knowledge we intend to interview program managers from five leading public sector jurisdictions and other international experts on DfE and EPR. Your program has been identified as a successful initiative that demonstrates how government can support and encourage industry to redesign their products and packaging to reduce impacts along the life cycle.

Questions

1. Please briefly describe your roles/responsibilities within this program.
 2. How were the mission and goals for this program developed? (E.g. internally, in consultation w/ industry, stakeholders, etc.)
 3. Please give a high level summary of how the program currently operates including its underlying framework?
 4. How have you encouraged industry to redesign their products to reduce their impact along the life cycle? (please also consider complementary policy instruments)
 5. What incentives are in place for producers to incorporate environmental considerations as early as the design phase, and for consumers to choose products with better environmental performance? What was the industry response to these measures?
 6. How is waste from this product group managed?
 7. How is the program financed? How long did it take to secure financing?
 8. How are accountabilities and responsibilities for program implementation assigned and reviewed?
 9. How are improvement targets set? How are results measured? Please consider quantitative (e.g. business, environment, social metrics) and qualitative benefits (e.g. behavioural changes).
 10. How are stakeholders involved in program design and delivery?
 11. What are the main challenges and barriers related to program implementation and how have these been addressed (or not addressed)?
 12. If you could go back in time and design and implement the program over again, what would you do differently? What are the key success factors for the program?
-

**Thank you for participating in this interview.
Your insights are greatly appreciated!**

APPENDIX 3: INTERVIEWS WITH INTERNATIONAL EXPERTS ON DfE AND EPR

The following international experts were interviewed for this report.

Name	Function
Chris van Rossem	Lund University
Naoko Tojo	Lund University
Clive Davies	US EPA, OPPT DfE Program
Emma Lavoix	US EPA, DfE Program

APPENDIX 4: INTERNATIONAL EXPERT INTERVIEW QUESTIONS

Interviews with international experts

Context

Our Project Team is currently working on behalf of British Columbia's Ministry of Environment to assess design for environment (DfE) opportunities in relation to the province's existing Recycling Regulations. The results of the assessment will help British Columbia to continually improve its policies and programs through an improved understanding of the alignment, relevance, opportunities and barriers to integrating DfE and other stewardship approaches.

In order to identify opportunities for improving upon their current stewardship practices, we are hoping to learn about challenges and opportunities other jurisdictions have realized by incorporating DfE principles and incentives into existing stewardship programs. To gain this knowledge we intend to interview program managers from five leading public sector jurisdictions and other international experts on EPR and DfE. Your insights and expertise in this area will help British Columbia to stimulate and encourage industry to take more responsibility for its products along the life cycle.

Questions

1. What can government do to stimulate and encourage industry to improve the design of their products and packaging to reduce impacts along the life cycle?
2. Can you point to any examples where government has successfully encouraged industry to redesign their products or packaging to reduce impacts along the life cycle? Why were these examples successful?
3. What challenges and barriers do governments typically encounter when trying to promote DfE among companies or industry sectors?
4. What can be done to overcome these challenges and barriers?

**Thank you for participating in this interview.
Your insights are greatly appreciated!**

APPENDIX 5: ADDITIONAL JURISDICTIONS REVIEWED PREVIOUSLY

Below are an additional three jurisdictions which were reviewed as part of the report developed for the Government of Alberta in 2006. Although not updated for this report they have been included here as they continue to provide valuable insight into program design and implementation.

STEWARDSHIP ONTARIO

Program Design and Goals - Ontario's Waste Diversion Act (WDA) requires all companies that introduce packaging and printed paper into Ontario's consumer marketplace ("Stewards") to share in paying 50% of the funding of Ontario's municipal Blue Box waste diversion programs. Stewardship Ontario was developed to meet the requirements of the Waste Diversion Act, and launched its program in February 2004. Stewardship Ontario is a multi-stakeholder body that acts as a connection between government and industry as the funding organization responsible for setting, financing and implementing a plan to meet the Provincial waste diversion requirements as set out in the WDA.

Part of Stewardship Ontario's policy is to change industry behaviour (i.e., promote DfE activities). Stewardship Ontario recognizes its current structure does not promote DfE and provides no real incentives for producers to redesign their packaging for better environmental performance. It has therefore planned to step up incentives for change through increased separation of material groups and assigning variable fees according to predetermined formulae.²⁸

Results – Currently the only tangible example of DfE under Stewardship Ontario is the Liquor Control Board of Ontario (LCBO), the single highest payer of fees in Ontario. Costs became so high for the LCBO in the program they introduced new wine packaging (in the form of a tetrapak), complemented by an effective marketing campaign. Stewardship Ontario and the LCBO tout the success of this initiative as it has reduced their costs and the public reception has been positive.²⁹

<http://www.stewardshipontario.ca/>

GERMANY'S GREEN DOT PROGRAM

Program Design and Goals – The German Packaging Ordinance, which came into force on 12 June 1991, is the legal basis for the work of Duales System Deutschland AG (DSD AG) and the Green Dot Program. The ordinance stipulates that used packaging must be recycled and that material-specific recycling targets must be fulfilled. In accordance with these statutory targets, DSD AG organizes the collection and sorting of used sales packaging as well as its transportation to the recycling plants. Trade and industry in their role as the producers of packaging waste arrange contracts with DSD AG which exempt them from their take-back and recycling obligation. They also pay licence fees for the

²⁸ Personal Interview with Derek Stephenson, Program Managers of Stewardship Ontario. October 2005. Stephens referred to research conducted by Dr. Jack Minns, head of the CD Howe Institute. Research showed that differential fees are needed to stimulate design change.

²⁹ Personal Interview with Derek Stephenson, Program Manager of Stewardship Ontario. October 2005.

right to use the Green Dot. DSD AG in turn enters into contracts with the waste management partners who are responsible for collecting and sorting the waste and forwarding it for recycling.

Duales System Deutschland AG gives companies an incentive to optimise packaging by way of the fees the licensees pay for the use of the Green Dot. Since the licence fees are determined by the packaging material and weight (i.e., they correspond to the costs for disposal and recovery that are actually incurred), the calculation is quite simple. If producers can save material, they do not have to pay as much.

Results – DSD AG reports packaging consumption per person in Germany has dropped from 96.8 kilograms in 1991 to 84.5 kilograms in 2003, a reduction of almost 13 percent. The design of sales packaging has also been modified in the last few years: refill packs and concentrates have replaced voluminous bottles, more products are sold without blister packs and secondary packaging made of cardboard or plastic has disappeared.³⁰ In addition to reported design changes, the organization PRO Europe is currently working with 24 countries interested in expanding the Green Dot scheme and applying it in their own regions.³¹

http://www.gruener-punkt.de/DER_GR_NE_PUNKT.50+B6Jkw9MQ_.0.html

UK WASTE MINIMISATION AND RESOURCES ACTION PROGRAMME (WRAP)

Program Design and Goals – The WRAP Program was established in 2001 in response to the UK Government's *Waste Strategy 2000* to promote sustainable waste management, the EU Landfill Directive (the UK has a legal obligation to comply with the terms under this Directive), and to help meet recycling targets under Packaging Regulations. WRAP recognized increases in recycling rates and composting would help the UK comply with the directive; however, it also felt a combination of sustainable design practice and waste management thinking was necessary to effectively address sustainable consumption and production issues in the country. To achieve its goals, the Government's strategy is to tackle the problem at a number of levels:

- Increasing local authority statutory recycling and composting targets;
- Raising recycling targets under packaging regulations;
- Increasing costs of landfill use through a Landfill Tax escalator;
- Installing new capacity to treat residual waste to render it inert so that it no longer counts toward the Landfill Directive Targets;
- Reducing the packaging of household waste by consumers, particularly the amount of packaging and food they throw away.

WRAP research showed 35-40% of household waste that ends up in a landfill began its life as a purchase from the top 5 retail supermarkets. In response they launched “the Retailer Initiative”, a program of activities aimed specifically at helping the retail sector to identify opportunities for more sustainable product design that facilitates both waste minimization and cost reduction. WRAP provides incentives for retailers to participate in the form of technical support, best in class data, help conducting research, and funding for R&D, demonstration and trial projects through its £8 Million Waste Minimisation Innovation Fund. Thirteen top retailers have signed on to WRAP's *Courtauld*

³⁰ Green Dot website. http://www.gruener-punkt.de/DER_GR_NE_PUNKT.50+B6Jkw9MQ_.0.html

³¹ Personal Interview with Derek Stephenson, Program Manager of Stewardship Ontario. October 2005.

Commitment to design out packaging waste growth by 2008 and deliver absolute reductions in packaging waste by March 2010.

Results – Results reported to date include a variety of innovative supply chain partnerships including one with Sprout Design and Tesco to design out waste from ready-meal packaging, Pira International and Altair Engineering to optimize material use in rigid plastic packaging, and ASDA, Kane Salads and Eco 3 to down-gauge the film in salad bags from 35 microns to 30 micron film³².

http://www.wrap.org.uk/waste_minimisation/retailer_initiative_innovation_fund/

³² Personal Interview with Mark Barthel. Special Adviser, Waste & Resources Action Programme, Retail Innovation Team October 2005.

EUROPEAN UNION INTEGRATED PRODUCT POLICY (IPP) PILOT PROJECTS

Program Design and Goals – In 2001, the European Commission released a green paper on IPP, and in 2003 a White Paper was released which was adopted by the European Commission and the Parliament.

Consultation with the Member States identified that practical guidance was needed on “how to roll out IPP – what is it, what is the methodology, how does it work.” Among several initiatives, the European Commission decided to launch the IPP pilot project exercise as a means of demonstrating how IPP can work in practice. The pilot projects were based on product panels used in Denmark and the Netherlands. One of the main goals of the IPP pilot projects was to bring multiple stakeholders from along the entire product chain to the table to identify significant environmental impacts and improvement options through redesign.

There were no financial incentives to attract companies to participate in the IPP Projects; however all who submitted proposals had good reasons for wanting to be involved.³³ As a leader, Nokia wanted to approach government before government approached them (i.e., with legislation). They wanted to come to the table to be able to influence policy.³⁴ Carrefour wanted to be involved as they recognized a hole in their sustainability strategy. The market (i.e., consumer) was not yet demanding greener products and Carrefour wanted help with marketing efforts, and raise its profile as a more sustainable product producer.

Results – The first set of pilot projects are still underway therefore it is too early to report on results. However, the Program has been successful at achieving its primary goals of bringing multiple stakeholders together (in a product panel format) to identify more sustainable solutions and to create two successful stories that can be used to demonstrate to European Member States how the IPP methodology can be practically applied.

The European Commission's Definition of Integrated Product Policy (IPP)

IPP represents a new approach to environmental protection in Europe and puts emphasis on three dimensions:

- **Life-cycle thinking** - when pollution-reduction measures are identified, consideration is given to the whole product lifecycle. This avoids shifting the environmental impacts from one phase of the lifecycle to another and reduces the overall environmental impact.
- **Flexibility** – Many different policy measures influence the environmental impacts of products such as taxes, product standards and labelling, and voluntary agreements. Given the wide variety in products it makes no sense to prefer any one type of instrument.
- **Full stakeholder involvement** – Throughout their long and complex lives, the environmental impacts of products are affected by the actions of many different stakeholders, such as designers, industry, marketing people, retailers and consumers. Reducing these impacts requires all stakeholders to take action in their sphere of influence: for example, manufacturers on the design and marketing of products, and consumers through product choices, use and disposal habits.

European Commission
europa.eu.int/comm/environment/ipp/home.htm

<http://europa.eu.int/comm/environment/ipp/pilot.htm>

³³ Personal Interview with Bengt Davidsson, European Commission. October 2005.

³⁴ Presentation at Product Sustainability Round Table Meeting in Rome Italy, April 2005. Salla Ahonen. Nokia.