packaging + printed paper

strategies to increase recovery in connecticut

PSI final presentation to connecticut DEEP

December 2015

PRODUCT STEWARDSHIP INSTITUTE

about this project

Prepared by

Product Stewardship Institute, Inc. for

the Connecticut Department of Energy and Environmental Protection (DEEP)

December 2015

Acknowledgement of Funding

The funding for this study was provided by the Connecticut Department of Energy and Environmental Protection (DEEP).

Acknowledgement of Assistance

Assistance was provided by Environmental Packaging International (EPI).

Product Stewardship Institute Inc. is an affirmative action employer and provider.

PRODUCT STEWARDSHIP INSTITUTE

meeting **context**

PRODUCT STEWARDSHIP INSTITUTE

meeting **expectations**

overall goal: data DEEP can use for proposal to legislature

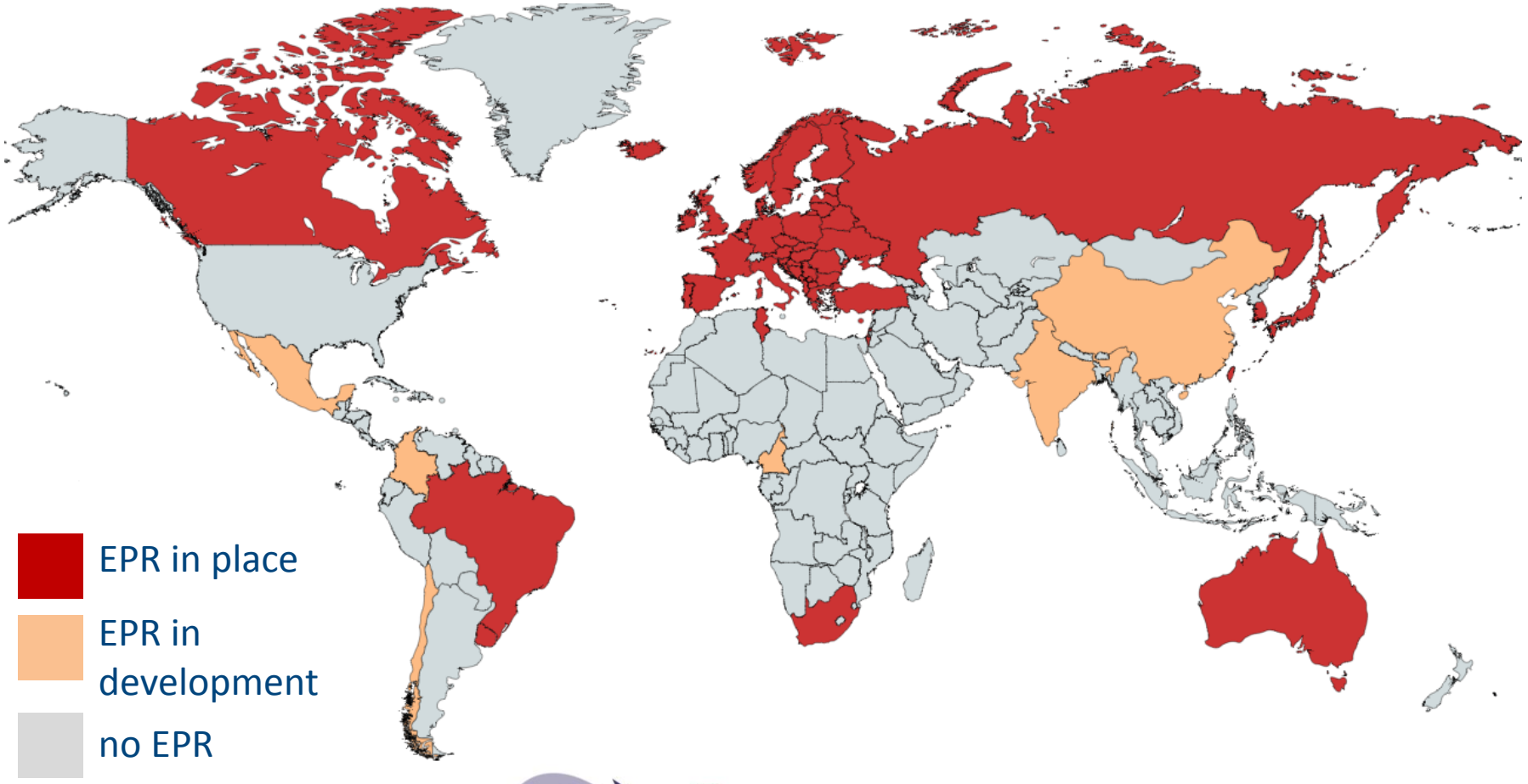
packaging design: examples of legislation, policies, or programs for consideration in 2017

target materials: projected glass recycling rate and escheats revenue if wine/liquor bottles added to bottle bill + deposit increase scenarios

building capacity for EPR: recommend whether CT should pursue a full or shared responsibility system, outline steps to help CT move closer to EPR legislation

PRODUCT STEWARDSHIP INSTITUTE

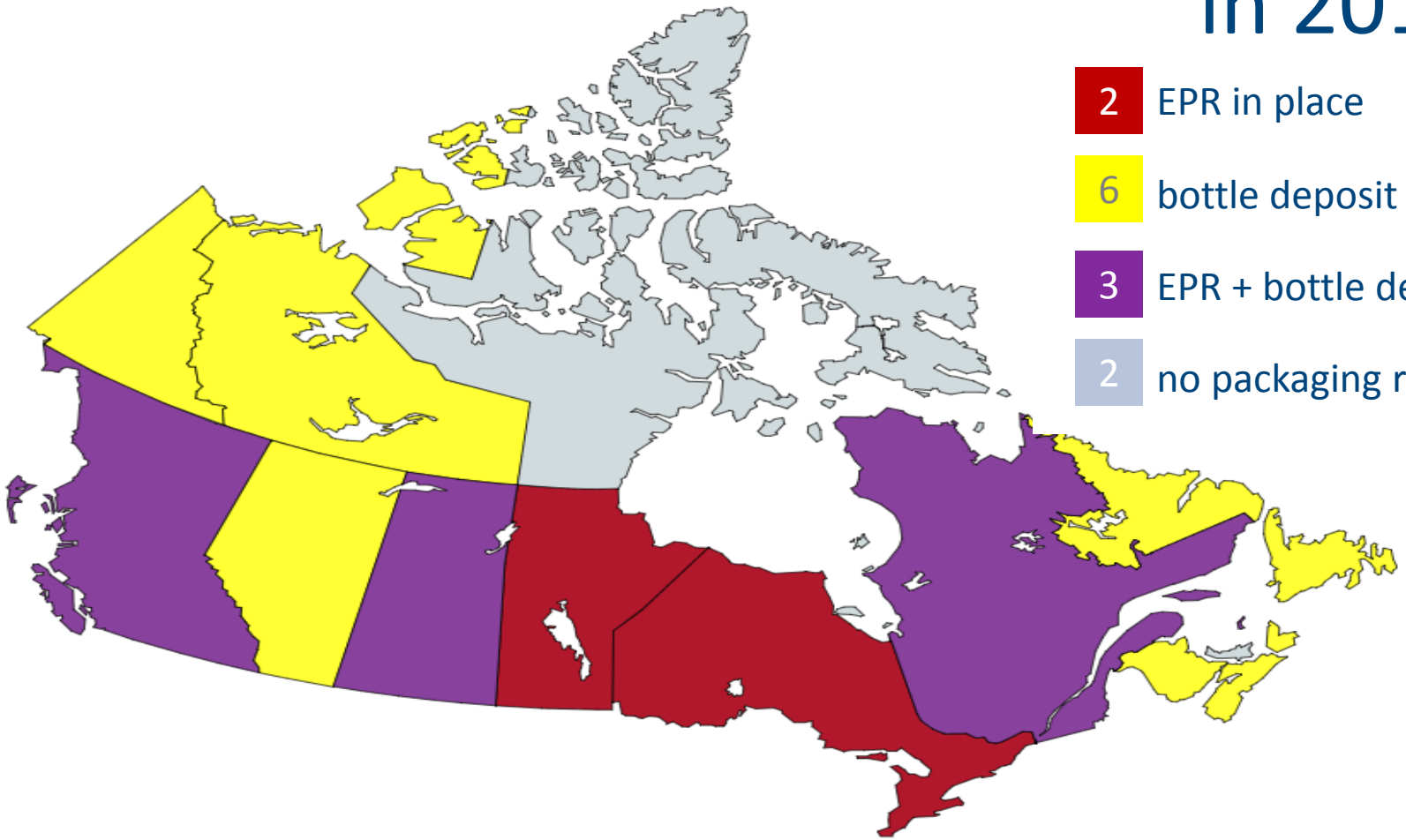
packaging EPR in 2015



Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

canadian packaging regulation in 2015



Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

packaging design

policy options

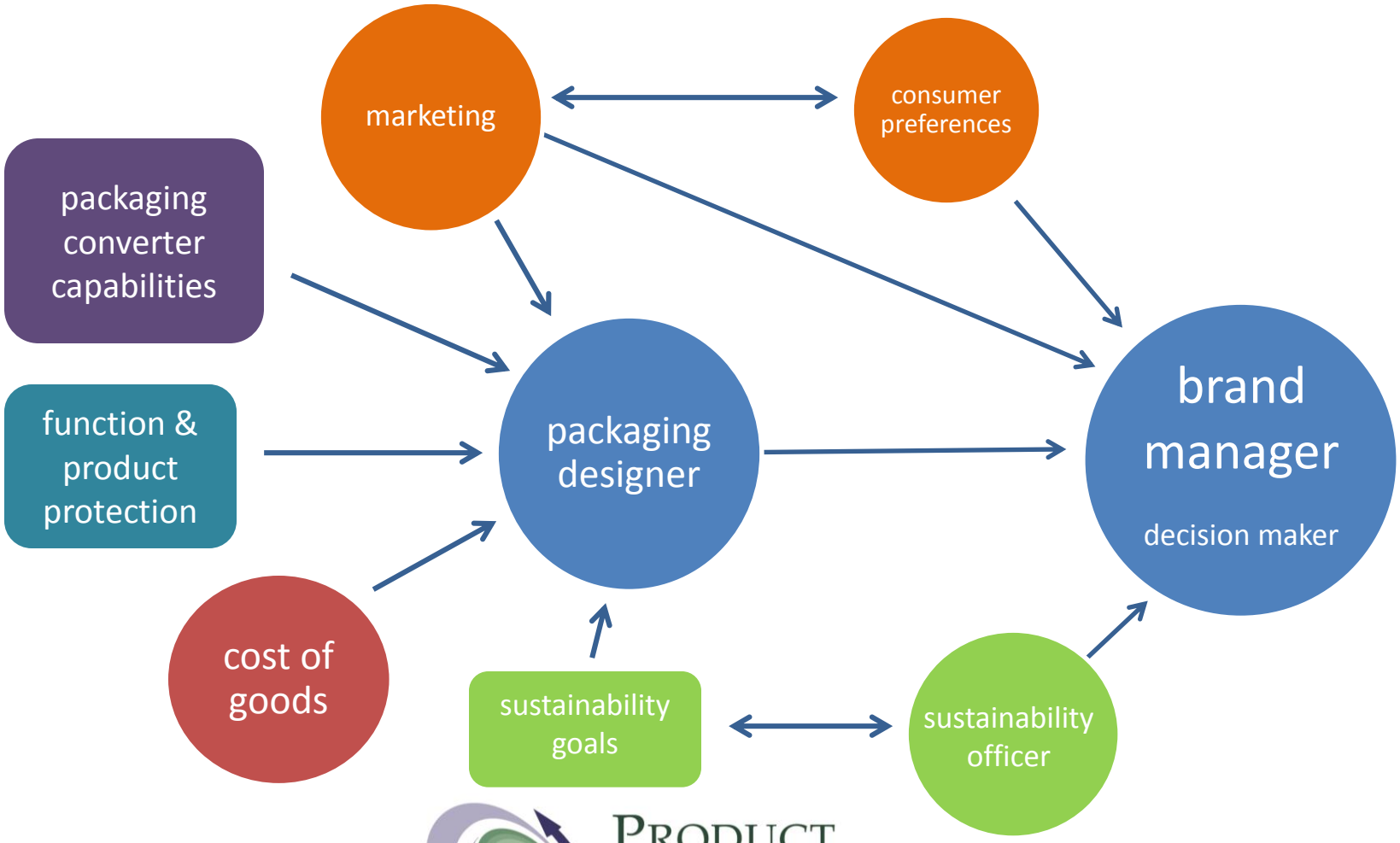
PRODUCT STEWARDSHIP INSTITUTE

introduction to **packaging design** process

- each manufacturer has a unique process
  - some have packaging design departments or divisions
  - some use consulting services and outsource all packaging design
  - some use consulting only for help with costs in the design phase
- primarily, packaging design is focused on marketing and creating brand recognition
- dependent on company values – which vary greatly

PRODUCT STEWARDSHIP INSTITUTE

packaging design
decisions & influences



PRODUCT STEWARDSHIP INSTITUTE

packaging design
policy options

- source reduction
  - packaging weight reduction
  - product concentration
- reuse/refill
- recycled content
- recyclability
- toxics reduction

PRODUCT STEWARDSHIP INSTITUTE

packaging design policies
without EPR

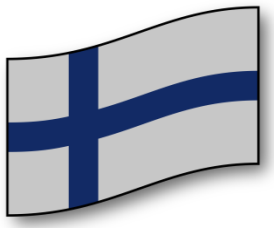
PRODUCT STEWARDSHIP INSTITUTE

packaging design

refillable bottle policy examples

- **canada**
  - prince edward island: non-refillable bottle ban 1977-2008
    - all carbonated beverages were sold in refillable bottles
    - banned the use of cans for carbonated beverages
  - ontario
    - 10¢ levy on non-refillable alcohol containers
    - 54% of beer sold in refillable containers in 2013

- **finland**
  - levy based on method for managing containers
    - no recovery of packaging waste = 0.67€
    - recycling = 0.17€
    - refillable = no tax



Source: GRRN, 2015

PRODUCT STEWARDSHIP INSTITUTE

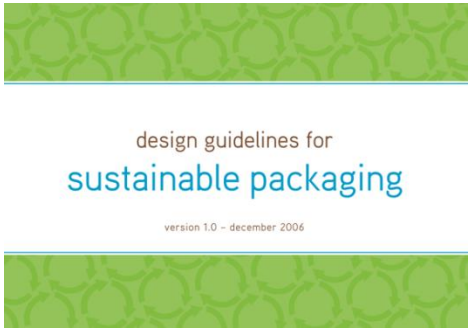
refillable bottle policy

- refillables work best in certain contexts for small geographic areas (CT)
  - focus on small enterprises
    - microbreweries
    - wineries
    - dairies

PRODUCT STEWARDSHIP INSTITUTE

industry voluntary efforts
to impact packaging design

- **sustainable packaging coalition** toolkits
- **association of postconsumer plastic recyclers** design for recyclability guidelines
- **EEQ** tools (quebec)



APR DESIGN FOR RECYCLABILITY

VOLUNTARY CODE OPTIMIZATION CONTAINERS, PACKAGING AND PRINTED MATTER
2011
eeq

PRODUCT STEWARDSHIP INSTITUTE

packaging design

EU packaging directive

- mandates that all packaging sold in europe meet a set of “Essential Requirements” related to:
  - source reduction (mandatory)
  - recovery (must meet at least one)
    - recyclability, organic recovery, energy recovery
  - heavy metals in packaging (mandatory)
  - reduction of other hazardous substances (mandatory)
  - reuse (optional)

PRODUCT STEWARDSHIP INSTITUTE

packaging design

EU packaging directive

- packaging that does not comply with these Essential Requirements can legally be banned from EU markets
- CEN/ISO standards are the most common method for assessing & demonstrating compliance
- more enforcement coming in both Western and Eastern Europe

PRODUCT STEWARDSHIP INSTITUTE

california **rigid plastic packaging container program**

mandates product manufacturers to meet one of the following compliance options:

- 25% post-consumer content
- reusable (5x)
- refillable (5x)
- achieve a 45% recycling rate (by resin type)
- alternative container
- source reduction
  - weight reduction by 10%
  - increase product concentration by 10 %
  - combine weight reduction & increased concentration
  - weigh 10% less when compared to similar products

- allows corporate averaging among product lines
- walmart uses this as criteria in sustainability index

PRODUCT STEWARDSHIP INSTITUTE

packaging design
empty space & layer regulation

- south korea
  - "Ordinance of the Standards for Methods and Materials, Etc. of Product Packaging" sets limits on the amount of empty space and the number of layers that consumer product packaging can have
- taiwan
  - empty space and layer limits for gift boxes of pastries, cosmetics, alcoholic products, and computer program disks went into effect July 1, 2006
- china
  - China Excessive Packaging - Food and Cosmetics regulation has mandatory requirements for empty space ratio, layers, and packaging cost for all food and cosmetics products as of April 1, 2010
    - packaging cost can't exceed 20% of the cost of the product

Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

packaging design policies
in EPR systems

PRODUCT STEWARDSHIP INSTITUTE

packaging design/EPR
PET example

- **france** one PRO charges lower fees on clear or light blue PET bottles
- **belgium** one PRO charges less for PET bottles (colorless, blue and green only) and HPDE bottles, lowering its rates for 2013 (2012 sales) by 21% for these materials
- **ontario** one PRO charges less for HDPE bottles and jugs and PET bottles

jurisdiction	clear/blue PET fee (USD)	colored PET fee (USD)
france	$0.0082	$0.009 (plus unit fee)
belgium	$0.0038	$0.009
ontario, canada	$0.0037	$0.009

Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

packaging design/EPR
glass example

- **ontario** one PRO charges lower fees for clear glass ($0.0284/kg) compared to colored glass ($0.0484/kg)
- **japan** obligated companies are charged three times more for colored glass compared to clear and amber glass

jurisdiction	clear glass fee (USD)	colored glass fee (USD)
japan	$0.003	$0.01
ontario, canada	$0.007	$0.0121

Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

disruptor materials & eco-design
incentives in france

- packaging that presents problems for recycling stream incur additional fees
  - Glass packaging with ceramic or porcelain cap +50% Fee
  - plastic PET bottles containing aluminum (labels, plugs, caps, inks), using PVC sleeves, or silicone +50% fee
  - packaging paper and cardboard reinforced with polyester +50% Fee
  - non-recoverable packaging or packing with sorting instructions but no recycling stream (stoneware, PVC and PLA bottles) +100% fee

- packaging that is eco-designed receive discounts
  - 8% discount for the use of on-pack labeling
  - 8% discount for source reduction

Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

composite thresholds
EPR packaging design requirements

- **germany**
  - all packaging: >95%
- **france**
  - all multi-material packaging: > 80%
  - if equal to or less than 80%, fees are assessed on each material
- **canadian provinces** thresholds vary from >50% to >95% on:
  - the type of packaging material and/or type of package
  - whether the packaging component remains attached to the packaging when the consumer disposes of the packaging
  - the packaging component is an integrated part of the packaging and is attached to the package

Source: EPI, 2015

PRODUCT STEWARDSHIP INSTITUTE

increase recovery value of glass
in single stream collection

PRODUCT STEWARDSHIP INSTITUTE

glass
issues

- contamination issues
  - glass in paper
  - paper and plastic in glass
- glass is not recovered clean enough to be economically recycled through current MRF design

- MRFs and disposal facilities agree that getting glass out of the waste stream is a priority
- ash from incinerated glass is a further disposal issue

PRODUCT STEWARDSHIP INSTITUTE

current deposit system

- 56% redemption rate (all containers)
- $39.5 million in escheats (from non-redemption)
- 74% redemption rate for glass

Source: CRI, 2015; CT DRS Escheats Data, 2015; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

exploring

bottle deposit solutions

percent of the current CT glass container waste stream that is covered by CT's current bottle bill:

Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

exploring bottle deposit solutions

74 %

of non-deposit glass is wine & spirit containers

Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

exploring bottle deposit solutions

total amount of glass that would be covered by an expanded bottle bill with wine and liquor bottles

125,000 tons

annually

Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

exploring bottle deposit
solutions

- expand glass to include wine and spirits
  - assumption: 15¢ deposit
  - projected results
    - 74% glass redemption rate
    - $42.4 million in escheats (increase of ≈$2.9 million)

caveat - uptick in redemption is expected with a higher deposit; this is not currently factored into the calculation

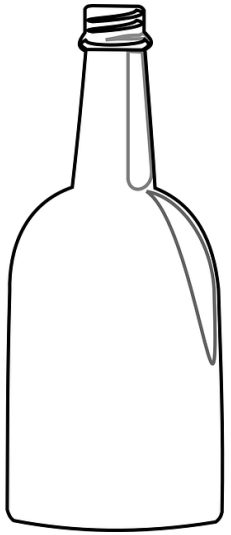
Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

exploring bottle deposit
solutions

- reducing contamination of other recyclables
  - remove **21,359 tons** of glass from single stream

- MRF benefits
  - reduce contamination
  - reduce worker hazard exposure
  - reduces wear and tear on systems



Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

escheat scenarios
all containers

current system: 56% redemption; $39.5 million in escheats

redemption rate	deposit increase to 10¢ (no expanded glass)	expanded glass + deposit increase to 10¢
65%	$62.7 million	$65.6 million
75%	$44.8 million	$47.5 million
80%	$35.8 million	$38.0 million
85%	$26.9 million	$28.5 million
90%	$17.9 million	$19.0 million

Source: CRI Analysis of BMDA for CT, 2010; Macri CT Deposit System Report, 2015

PRODUCT STEWARDSHIP INSTITUTE

building capacity for
EPR for PPP

PRODUCT STEWARDSHIP INSTITUTE

PPP scope

- no universal definition
- only MSW in most cases
- most european countries do not include printed paper
- CT can customize materials to be included in law
- **US caveat** – if newspapers are included as printed paper, expect push back due to freedom of press
- example - british columbia PPP definition
  - all packaging generated by a residential consumer
  - “printed paper” includes all paper used for communication
    - e.g., phonebooks included, text books excluded

PRODUCT STEWARDSHIP INSTITUTE

EPR for PPP **benefits**

- **packaging design influence** – different material fees
- **increase recovery rate** – up to 80% recovery
- **resident convenience** – standardized accepted materials
- **improved quality** – higher recycling rate; less contamination
- **cost savings for government** – 50% to 100%
- **increased investment** – PROs invest in infrastructure
- **infrastructure efficiency** – brand owners have economic incentive to improve efficiency and gain economies of scale

PRODUCT STEWARDSHIP INSTITUTE

players

ENCORP Return-It™
It's Worth It.

PRODUCT STEWARDSHIP INSTITUTE

EPR for PPP
state role

- **legislative oversight**
  - **define scope** of packaging and printed materials
  - require producer **financed + managed** system
  - performance **targets by material**

- **CT DEEP oversight**
  - **plan submitted** to agency for approval
  - create **level playing field**
  - **funded by administrative fees from PROs**

- **funding designated to PROs,** not general fund

PRODUCT STEWARDSHIP INSTITUTE

stewardship organizations

- single PRO* is most common
- multiple PROs compete against one another to collect material
- PSI recommends one managing authority** that covers all stewards, with the ability for producers to form one or more PROs
- PSI does not recommend PROs that are material specific
  - would be complicated, especially in single stream system

*PRO: producer responsibility organization - collects material and funds the system

**managing authority coordinates the overall EPR system

PRODUCT STEWARDSHIP INSTITUTE

manufacturers

- **british columbia**
  - 919 stewards
  - de minimis exemption for PPP producers
    - with revenues of $1M or less
    - supply less than 1 ton of PPP
    - single point of retail sale (not a chain or franchise)
    - non-profits

  - **flat fees for low volume (1-5 tons) producers**
    - $550 or $1,200

Source: MMBC 2014 Annual Report

PRODUCT STEWARDSHIP INSTITUTE

manufacturers

- **belgium**
  - 1 PRO: 5,217 stewards (de minimus exemption)
- **germany**
  - 11 PROs
  - largest PRO
    - 18,000 stewards covering 50% market share
- **france**
  - 1 PRO: 23,038 licensees' contracts representing 50,000 companies (2012)

Source: PSI Summary Report, 2014

PRODUCT STEWARDSHIP INSTITUTE

full vs. shared EPR

control and cost

(control = ownership of material + decision making power)

full = producers have control and pay all

ex. paint & mattresses

shared = producers pay some, taxpayers pay some

control is divided

PRODUCT STEWARDSHIP INSTITUTE

current PPP recycling system

TAXES/FEES

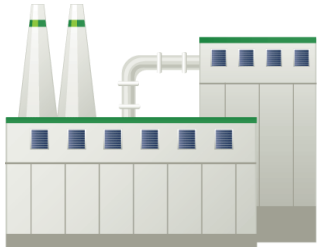
GOVERNMENT

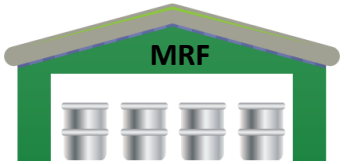
Brand owners of finished product buy packaging/paper

FEES

CITY CONTRACTS

Hauler and/or processor charges consumers and/or cities for collection and sells bales





End market (paper mill, plastic manufacturer, etc. buys from processor)

Source: PSI adaptation from Recycling Reinvented, 2013

PRODUCT STEWARDSHIP INSTITUTE

how EPR for PPP works
shared responsibility upstream model

Brand owners internalize partial cost of EPR in new product

Brand owners pay into trust

Brand owners of finished product buy packaging/paper

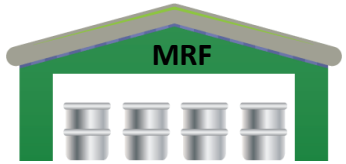
FEES

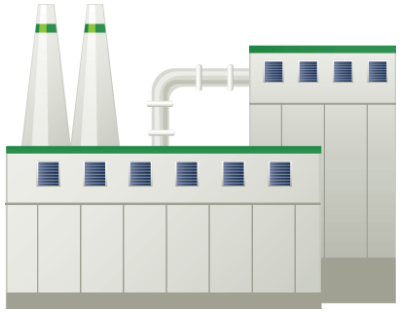
TAXES/FEES

GOVERNMENT

Authority manages trust; partially funds municipal recycling

Hauler and/or processor charges consumers and/or cities for collection and sells bales





End market (paper mill, plastic manufacturer, etc. buys from processor)

Source: PSI adaptation from Recycling Reinvented, 2013

PRODUCT STEWARDSHIP INSTITUTE

how EPR for PPP works
full EPR system

Brand owners internalize cost of EPR in new product

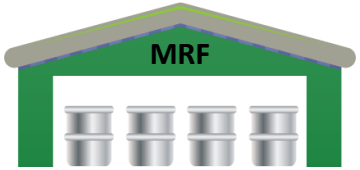
Brand owners of finished product buy packaging/paper

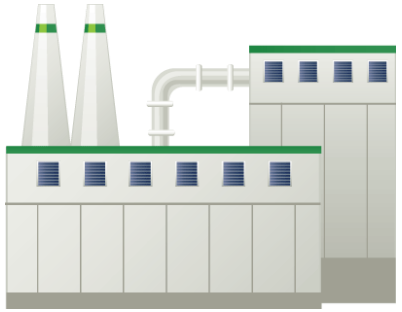
Brand owners pay hauler/processor for collection/processing through a managing authority or PRO

State creates level playing field among brand owners; City sets up hauler standards, licensing

Haulers/processors negotiate with brand owners

Processors & brand owners can negotiate over materials revenue





End market (paper mill, plastic manufacturer, etc. buys from processor)

PRODUCT STEWARDSHIP INSTITUTE

Source: PSI adaptation from Recycling Reinvented, 2013

examples of existing EPR programs
funding schemes

jursidiction	producer funding	government funding
ontario	50%	50%
saskatchewan	75%	25%
manitoba	80%	20%
quebec	100%	0%
british columbia	100%	0%

Source: PSI Summary Report, 2014

PRODUCT STEWARDSHIP INSTITUTE

full EPR
breaking down the complexity

control

- system is typically managed solely by manufacturers through PRO
- program decisions driven by performance and cost efficiency

infrastructure

- existing infrastructure may or may not be used
- likely to result in significant change in infrastructure driven by efficiency and maximizing investment
  - ex. transfer stations and MRFs strategically placed

PRODUCT STEWARDSHIP INSTITUTE

european epr legislation
full EPR

belgium

100% producer responsibility

$7.03 USD producer contribution per capita 2012

2010 recycling rate 80%

bottle deposit scheme for all beverage containers

factors packaging recyclability into funding formula

does **not** include printed paper

source separation – glass, paper/occ, pmd

Source: PSI Summary Report, 2014

PRODUCT STEWARDSHIP INSTITUTE

canadian epr legislation
full EPR

british columbia 2014

100% producer responsibility

program cost: $27 per household

recovery rate 80%

includes all packaging materials + printed paper

single stream

bottle deposit scheme for all beverage containers

Source: PSI Summary Report, 2014; MMBC 2014 Annual Report

PRODUCT STEWARDSHIP INSTITUTE

british columbia year 1
case study

- servicing **1.24 million curbside** and multi-family households
- servicing **96% of households** through the depot network
- offering a **standard basket of goods** for residential collection
- providing **20 communities** with curbside recycling for the first time

Source: MMBC, 2015

PRODUCT STEWARDSHIP INSTITUTE

british columbia year 1
case study

- **curbside recycling**
  - local govs receive MMBC incentives on a per-household basis
  - direct service by MMBC in 10 jurisdictions
- **multi-family recycling**
  - local govs & private companies receive MMBC incentives on a per-household basis
- **depots**
  - local govs, non-profits, and private companies receive MMBC incentives on a per-ton basis

Source: MMBC, 2015

PRODUCT STEWARDSHIP INSTITUTE

british columbia year 1
case study

- MMBC is responsible for all **post-collection activities** by hiring contractors to:
  - **pick up** PPP from depots
  - **receive** PPP from curbside and multi-family building collectors
  - **transport, process, and market** PPP
- green by nature (GBN) awarded post-collection contract

Source: MMBC, 2015

PRODUCT STEWARDSHIP INSTITUTE

british columbia year 1
case study

2014 MMBC performance:

- **80% recovery rate** for covered materials
  - exceeds the regulated 75% target
- over **116,000 tons** of recyclables collected from households & depots in 7.5 months of operation.
- over **93% of material** collected is recycled
  - exceeds the target of 85-90% in stewardship plan

Source: MMBC, 2015

PRODUCT STEWARDSHIP INSTITUTE

british columbia year 1
case study

a smooth transition for residents:

- **74% of residents** agree that the program meets/exceeds their expectations
- **86% of residents** find the recycling service unchanged or better than one year prior
- **39% of residents** say the frequency and availability of recycling information improved over the past year

Source: MMBC, 2015

PRODUCT STEWARDSHIP INSTITUTE

projected costs & savings for full EPR in minnesota

- goal: collect more material for less public cost
- recycling reinvented study for EPR in Minnesota
  - assumptions for PPP recycling
    - 100% single stream
    - standardize and expand accepted materials
    - increase curbside/multifamily service from 70% to 87%
    - include public space recycling from EPR funding
  - results
    - recycling rate increase from 50% to 66%
    - estimated cost per ton decrease from $166 to $134

Source: Recycling Reinvented Working Papers 1-3, 2014

PRODUCT STEWARDSHIP INSTITUTE

shared EPR
breaking down the complexity

control

- needs an authority to manage/make decisions that splits control among those who share costs (municipalities/manufacturers)
- new management authority makes decisions on infrastructure (e.g., how many MRFs to use)

infrastructure

- not likely to cause significant changes because those with a stake in existing infrastructure have a role in decisions
  - ex. ontario MRF efficiency analysis and outcome

PRODUCT STEWARDSHIP INSTITUTE

canadian epr legislation

shared responsibility EPR

ontario

50% producer responsibility

$6.31 USD producer contribution per capita 2012

2011 recycling rate 64%

bottle deposit scheme for all alcoholic beverages

considers packaging design marketability

manitoba

80% producer responsibility

$9.21 USD producer contribution per capita 2012

2011 recycling rate 52%

bottle deposit scheme for beer only

Source: PSI Summary Report, 2014

PRODUCT STEWARDSHIP INSTITUTE

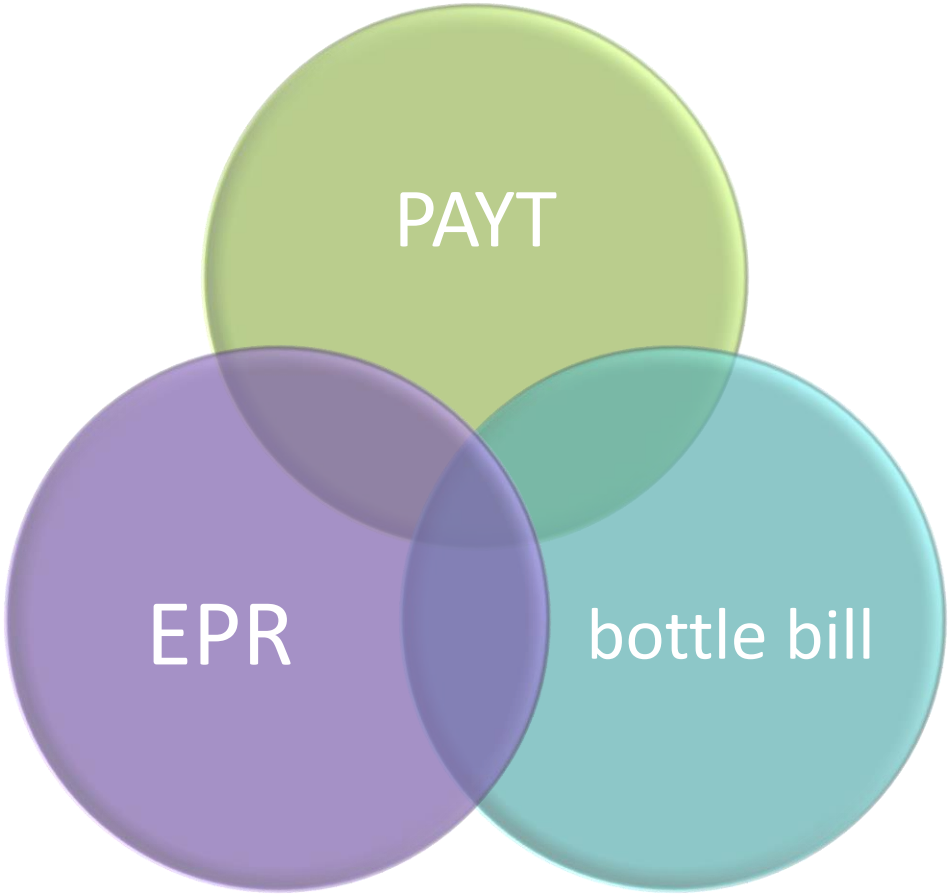
EPR system infrastructure

- EPR incentivizes efficiency
  - financial penalties for stewardship organization if recovery goal is not met
- there is a strong incentive then for investment in infrastructure that increases efficiency
  - EEQ (Quebec) $40M over 5 years for glass sorting technology updates
- plastics recovery facilities (PRFs) – secondary sorting process
  - 225 facilities currently in europe
  - growing trend in the US (closed loop fund project)

PRODUCT STEWARDSHIP INSTITUTE

policies working together

PAYT + bottle bill + EPR



PRODUCT STEWARDSHIP INSTITUTE

policies working together
bottle bill + EPR

- container deposit systems implemented prior to EPR law generally remain intact
- multiple structural options on how deposit system works with EPR system
  - multiple PROs that interact (ex: manitoba)
  - designated materials within EPR scope could exempt containers within deposit system
  - designated materials could include beverage containers to pay for containers collected outside deposit redemption
- areas where deposit systems and EPR work together
  - austria, belgium, germany, netherlands, british columbia, quebec

PRODUCT STEWARDSHIP INSTITUTE

policies working together
PAYT + EPR

- european countries with EPR + mandatory PAYT
  - belgium
  - france
  - germany
- PAYT incentivizes behavior to recycle, thereby increasing participating in the EPR program
  - residents are ultimately the ones who will help brand owners meet their recovery goals

Source: PSI Summary Report, 2014

PRODUCT STEWARDSHIP INSTITUTE

contact information

scott cassel
chief executive officer & founder
617.236.4822
scott@productstewardship.us

www.productstewardship.us

PRODUCT STEWARDSHIP INSTITUTE

references

1) PSI Study of 11 Global EPR Programs, 2014

2) Recycling Reinvented Working Papers 1-3, 2014

3) Multi-Material British Columbia (MMBC) Annual Report, 2014

4) GrassRoots Recycling Network, 2015

5) Connecticut Dept. of Revenue Services Escheats Data, 2015

6) Excerpts from Connecticut Deposit System Report, Daniel Macri, 2015

7) Environmental Packaging International (EPI), personal communication with Victor Bell, 2015

8) Multi-Material British Columbia (MMBC), personal communication with Allen Langdon, 2015

9) Recycling Reinvented, 2013; personal communication with Paul Gardner, 2015

10) Container Recycling Institute (CRI) Connecticut Beverage Market Data Analysis (BMDA) , 2010

PRODUCT STEWARDSHIP INSTITUTE

appendix

material fee example
in EPR systems



Canadian Province Fees for 2013 Sales	PET Bottle	Glass Bottle	Paper + Plastic + Multilayer Combo	Plastic Pouch
Ontario	$5.94	$7.33	$3.04	$5.98
Quebec	$9.19	$22.50	$5.59	$11.76
British Columbia	$12.94	$57.91	$8.49	$12.26
Average Fees	**$9.36**	**$29.24**	**$5.71**	**$10.00**

per 1000 units, in USD

Source: EPI, 2015.

PRODUCT STEWARDSHIP INSTITUTE