

# Turning Up the Heat on Foam Recycling

## Grande Prairie & Cochrane, AB

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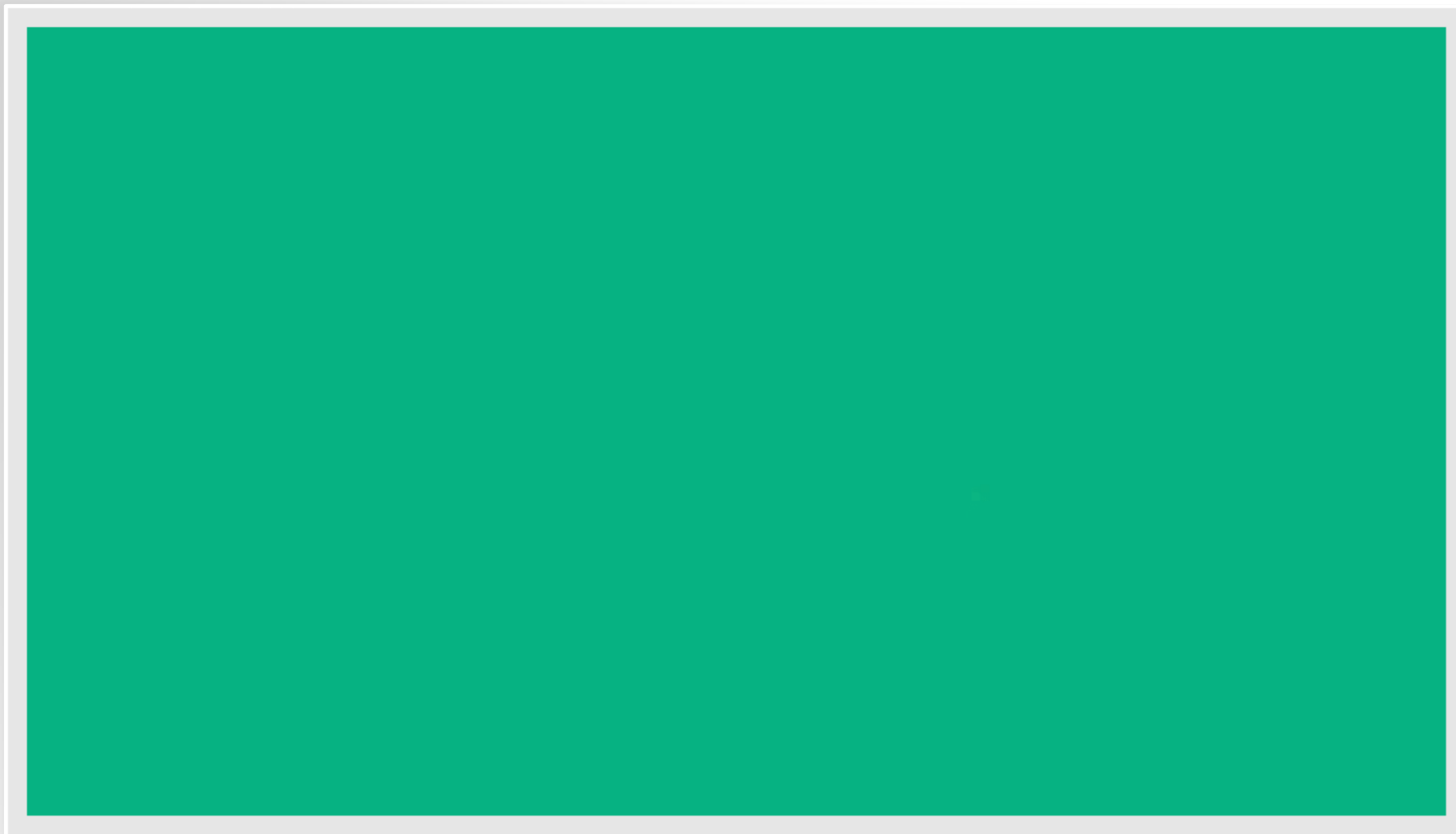


**Do YOU Have a Waste Polystyrene Problem?**

# Program Development Considerations

1. Why recycle foam?
2. Packaging diversity
3. Collection Methods
4. Operating & Storage Space
5. Processing Technology
6. Transportation & Markets
7. Case Studies: Cochrane & Grande Prairie

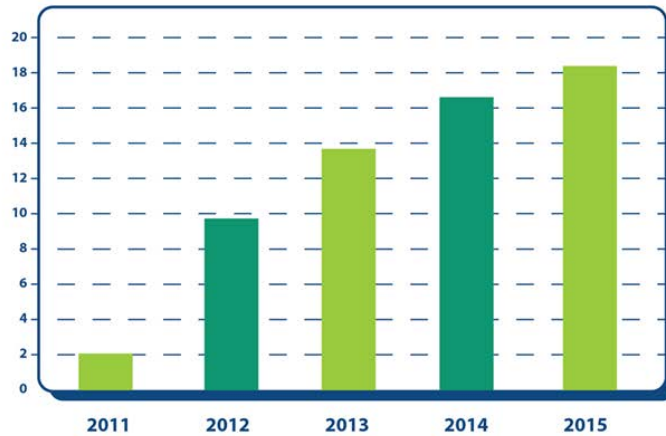
# Why recycle foam?



# Landfill Net Benefit

## Revenue

EPS Tonnage Diverted



## Revenue

Tonnage of Waste in Place of EPS



# Controlling Disposal Costs

- Hauling: \$250 Lift
- Disposal: \$95-113/MT

= Opportunity!





# What are we talking about when we talk about “Styrofoam”?

- Take out containers
- Meat Trays/Egg Cartons
- Packing foam
- Packing peanuts
- Styrofoam insulation
- EPS, EPP, EPE



# Packaging Diversity





# Collection Methods

- Eco Centres
- Landfills
- Curbside Collection



# MMBC Depot Collection & Meaford, ON



Campbell Mountain Landfill mega bag depot

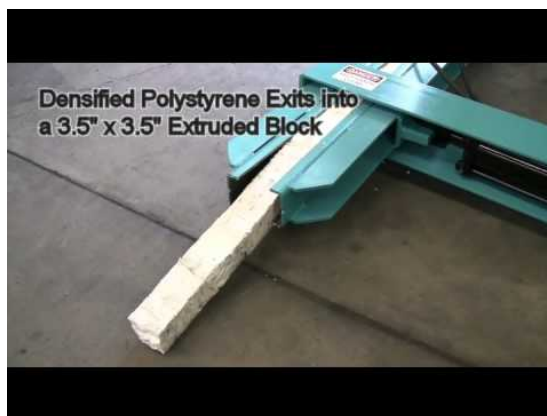




# Operating Space & Storage



# Processing Technology





# Transportation & Markets



## EPS Pricing 2016

- Thermal \$0.06-\$0.10/lb
- Cold Compacted \$0.02-\$0.05/lb
- Full loads preferred
- EPP and EPE similar rates
- Overseas & Domestic



# Case Studies



## Town of Cochrane Program 1 2009 – 2014

- Launched July 2009
- Resident drop off at Eco Centre
- Cold Compaction
- Acceptable Material: Clean White Packing Foam Only
- 30 MT July 2009 – January 2015

# Greenmax Cold Compactor





# Operating Costs

CAPITAL COSTS		OPERATING COSTS (ANNUAL)	
MACHINE PURCHASE	\$35 000 USD	MAINTENANCE	\$2500
INSTALLATION & RENO	\$10 000 CND	ELECTRICITY	\$500
		STAFF EXPENSE	\$12 600
		TRANSPORTATION	\$1200
		TOTAL	\$16 800

## Operating/Storage Space

- Loose material processed immediately (no storage)
- Pallets could not be stacked in yard
- Limited yard space





# Transportation

- Expensive to haul
- Too light
- Awkward & Unstable
- Terrible Payload



## Program 2 2015 - Present

- FD-25
- Thermal densification
- Expanded acceptable materials
- Capital \$33 380 US

### FOAM RECYCLING

#### ACCEPTING FOAM & EXPANDED POLYSTYRENE

- Clean white packing foam
- Packing foam peanuts (must be bagged)
- Foam servingware: cups, plates, take out containers, meat trays, egg cartons
- Styrofoam insulation (blue/pink)



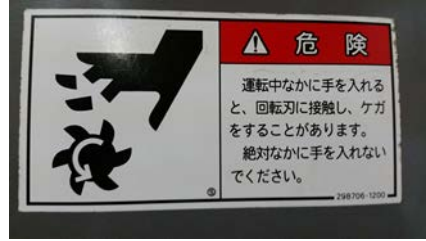
#### PLEASE NOTE

- All foam must be clean of residue and free of tape/labels
- No spray foam, textile or furniture foam
- Film foam goes with plastic bags



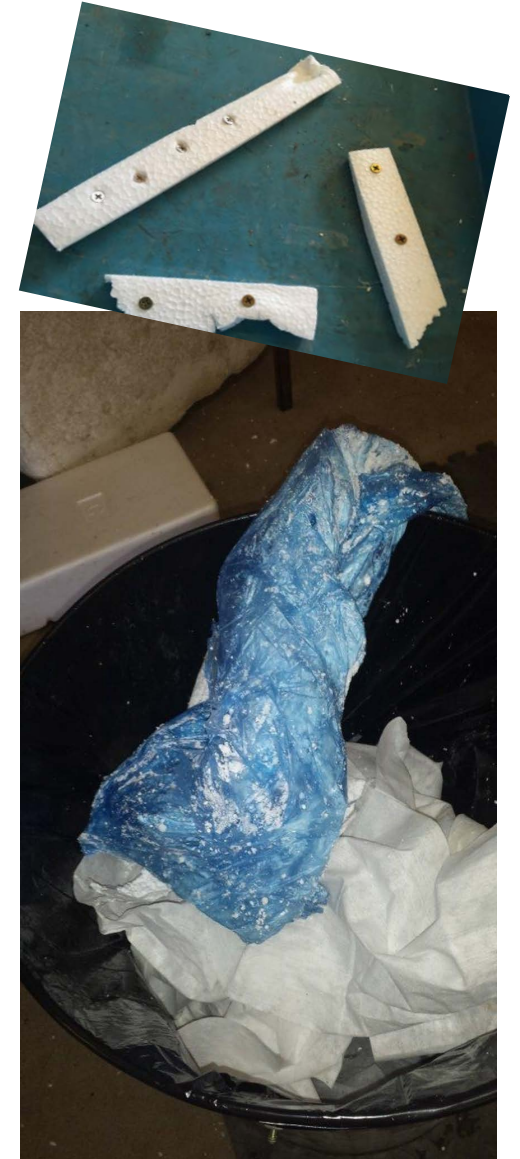






## Challenges:

- Machine arrived with **ONLY** Japanese labelling!
- Discovered packing peanuts are not styrofoam: they melted and fused to heater in the machine.
- Contamination in the form of screws and nails, if not caught, feed into the machine and cause downtime and expensive repairs/parts replacement.
- Coloured Styrofoam – is now comingled (as long as #6 PS)
- Other contamination – all material must be sorted by staff before processing





### Yamamoto Styrofoam Compactor High Melter RE-ES01X

- Capable of densifying EPS, PSP, XPS, EPP & EPE
- Processes 50 kg/hour
- Produces compacted (melted & moulded at 170C) 15 x 5 x 50 cm blocks of approx. 2.5 kg each
- Machine weighs 1160 kg
- Machine dimensions are 292 x 150 x 188 cm (as purchased, plywood hopper not included in measurements)







=



One full Transit Bag = One ingot



- Bins provided at Eco Centre and Landfill for residents to place their clean styrofoam (#6 PS only).
- Staff sort transit bags to ensure no contamination.
- Styro fed into machine hopper and ingots are extruded.
- Ingots are palletized (each palette is approx. 1 metric ton) and stored outside



Machine purchased and arrived on-site in July 2011.

Landfill Space Value of Diverted EPS								
Year	EPS Tonnage Diverted	EPS Kgs	(50-100kg/m3)	of EPS (cubic	Revenue if disposed	Typical Waste in Place	Tonnes of Waste in place of EPS	Revenue from Waste in place of diverted EPS
2011	2	2000	50	40	\$178.00	1000	40	\$3,560.00
2012	9.5	9560.36	50	191.2072	\$845.50	1000	191.2072	<b>\$17,017.44</b>
2013	13.67	13670	50	273.4	\$1,216.63	1000	273.4	<b>\$24,332.60</b>
2014	16.384	16384	50	327.68	\$1,458.18	1000	327.68	<b>\$29,163.52</b>
2015	18.581	18000	50	360	\$1,765.20	1000	360	<b>\$34,200.00</b>
Total	60.135	57614.36		1152.287	5285.501		1152.2872	\$104,713.56
This calculation is based on the volume of landfill space made available for regular waste to be compacted by the diversion of EPS								





## Other Foam Recycling Initiatives

- Vernon, BC
- Nanaimo, BC
- Gibsons, BC
- Emterra (MMBC)
- Airdrie, AB
- Plasti-Fab
- PEL Recycling
- SEARS Western  
Canada  
Distribution  
Centre

## Would we recommend it?

Yes.....but.

- Pick the right technology and right size it.
- Ensure you have lots of operating & storage space.
- Recognize from the get go that you are not going to get rich.