



**MEETING SUSTAINABILITY  
INITIATIVES WITHOUT  
COMPROMISING  
PERFORMANCE OR  
INCREASING COST**

Presented by: **Jim Lush & Dante Ferrari**  
Celplast Metallized Products  
AIMCAL Conference, October 19-22, 2008



# OUTLINE

- **Sustainable Packaging: The Driving Forces**
- **Biodegradable Films and Performance**
- **Source Reduction**
  - Downgauging Film
  - Less Aluminum
  - Layer Elimination
- **Other Answers to Sustainability**
- **Conclusions**

# Sustainable Packaging: The Driving Forces

Presented by: Jim Lush & Dante Ferrari  
Celplast Metallized Products  
AIMCAL Conference, October 19-22, 2008



# THE DRIVING FORCES

## 1. Wal-Mart

- The Wal-Mart Scorecard
- The Sustainability 360 initiative
- The seven R's
  - Remove
  - Reduce
  - Reuse
  - Recycle
  - Renew
  - Revenue
  - Read

# THE DRIVING FORCES

## 2. Other Retailers

- Marks and Spencer- 2008
  - Sustainability is all about meeting our needs today without robbing future generations of the ability to meet theirs.
  - Became the first retailer member of WEC (World Environment Center).
  - Won WEC Gold Medal Award for International Achievement in Corporate Sustainability Development.
  - Made progress in 94 of it's 100 point "Plan A" initiative to become carbon neutral by 2012.
  - Launched it's first eco-store in late 2007

# THE DRIVING FORCES

## 2. Other Retailers

- Tesco- 2008
  - Reduce packaging on own brand and branded labels by 25% by 2010
  - Working with WRAP (Waste & Resources Action Program)
  - Saved 2,600 tonnes of glass from one supplier by challenging them to produce lighter weight glass.
  - Reductions in packaging of sandwich's has reduced 15 tonnes of waste per month.
  - Importing wines in bulk and bottling them locally has saved 4,100 tonnes of carbon emissions.

# THE DRIVING FORCES

## 3. Consumers & Government

- 58% of consumers are not green motivated
- 25% of consumers are green interested
- 17% of consumers are green motivated
- These numbers are changing
  - Government influence
  - Celebrity influence
  - Guilt

# THE DRIVING FORCES

## 4. Our Industry

- CPG's and converters are not drivers but they are critical to the process and must respond
- FPA (Flexible Packaging Association) created a sustainability committee
- TAPPI recently had a sustainability workshop
- Trade shows such as Pack Expo & Interpack have sustainability specific sections.
- Wal-Mart representatives attended Pack Expo to educate suppliers on how to use the Wal-Mart score card.
- Symposia dedicated to sustainability.
- Companies dedicating personnel and creating departments for their sustainability initiatives.



# THE DRIVING FORCES

## 5. Raw material and energy costs

- The economics are changing
- Source reduction becomes important to the sustainability and cost saving initiatives
- Layer elimination offers the greatest opportunity for source reduction

# BIODEGRADABLE FILMS & PERFORMANCE

Presented by: **Jim Lush & Dante Ferrari**  
**Celplast Metallized Products**  
AIMCAL Conference, October 19-22, 2008



# BIODEGRADABLE FILMS & PERFORMANCE

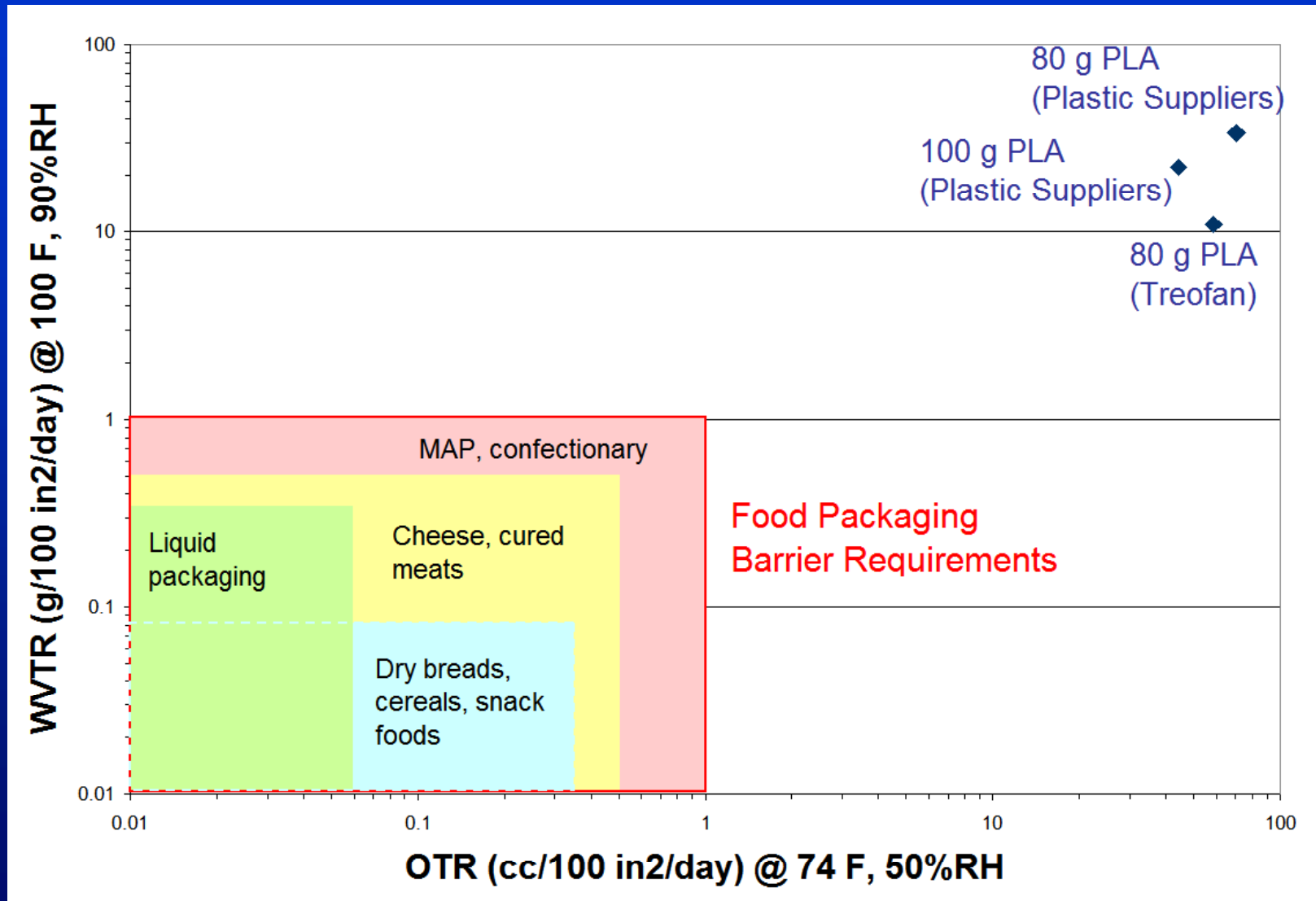
## Benefits of PLA:

- Processes similar to PET film
- Availability - two film manufacturers in North America, several globally
- High clarity
- Good deadfold

## Challenges:

- Low temperature resistance
- Poor barrier properties

# BIODEGRADABLE FILMS & PERFORMANCE



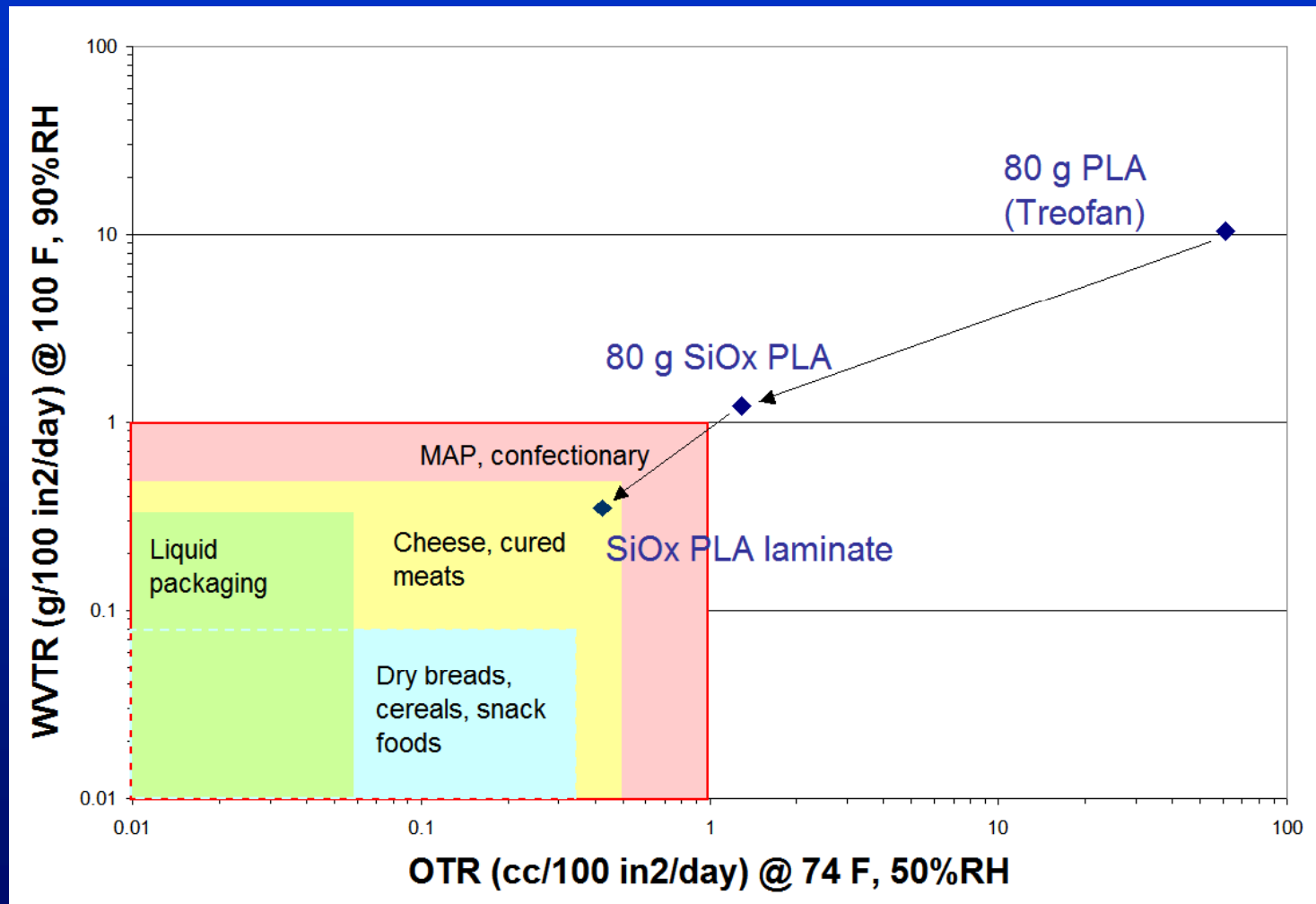
# BIODEGRADABLE FILMS & PERFORMANCE

## Solution #1: Clear Barrier

- SiO<sub>x</sub>-coated PLA film
- Food packaging type barrier properties
- High clarity, colourless
- SiO<sub>x</sub> nanolayer represents <0.1% of film structure, so metallized PLA is still compliant with international compostability requirements

# BIODEGRADABLE FILMS & PERFORMANCE

## Solution #1: Clear Barrier



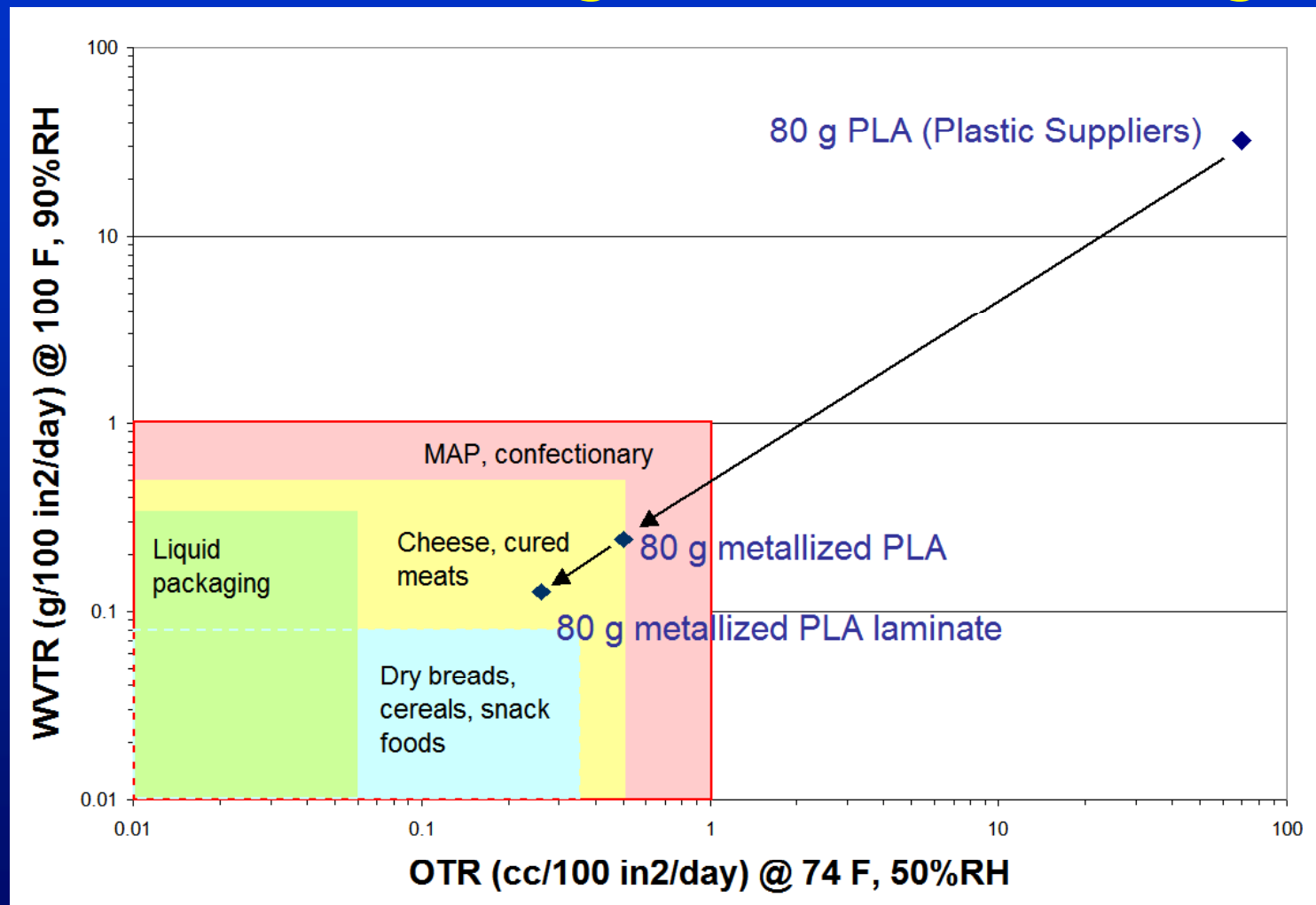
# BIODEGRADABLE FILMS & PERFORMANCE

## Solution #2: High Barrier Metallizing

- Nanolayer of high barrier aluminum on PLA film
- Meets the needs of a broader range of food packaging applications
- Bright, metallic look
- Metal nanolayer represents <0.1% of film structure, so metallized PLA is still compliant with international compostability requirements

# BIODEGRADABLE FILMS & PERFORMANCE

## Solution #2: High Barrier Metallizing





# SOURCE REDUCTION

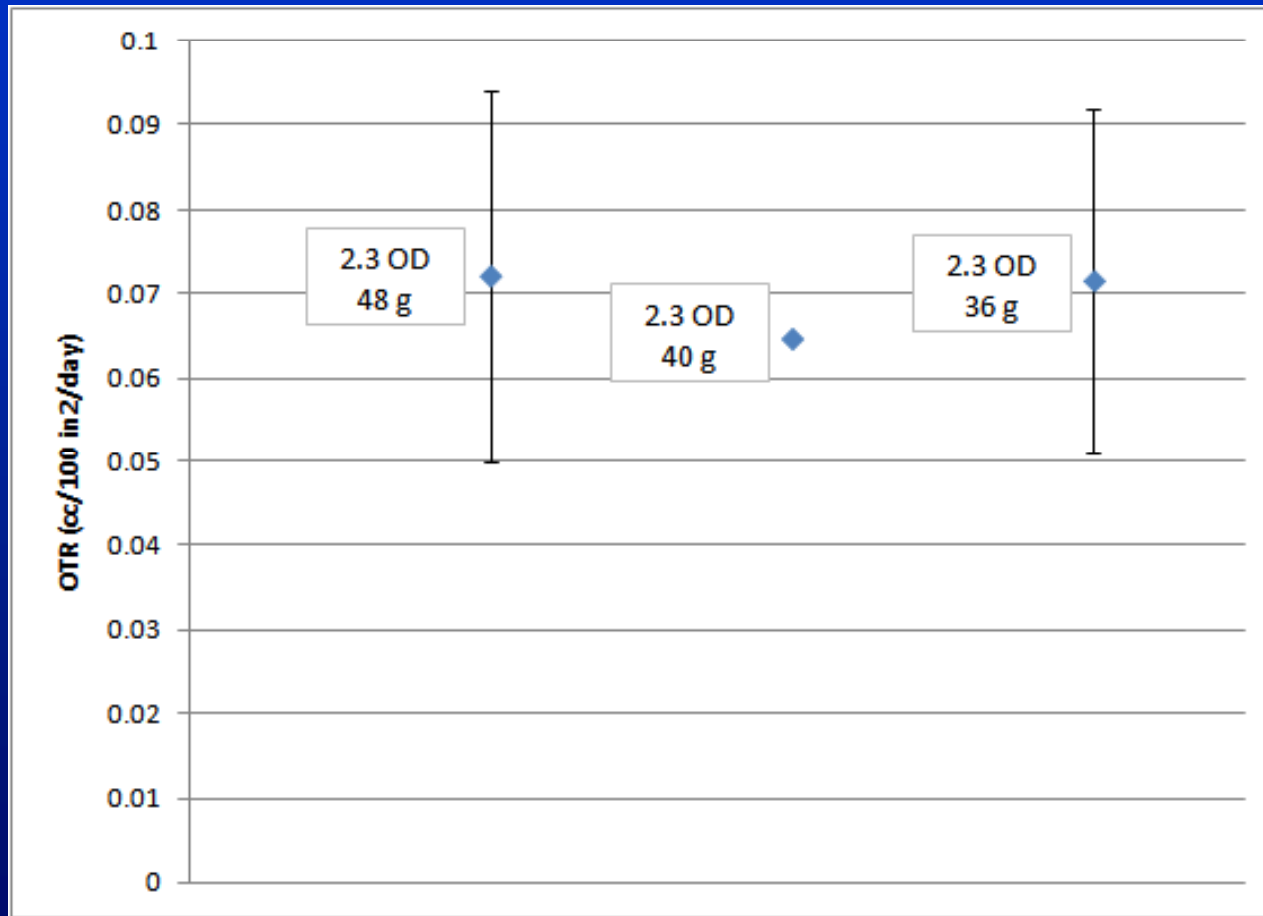
Presented by: **Jim Lush & Dante Ferrari**  
**Celplast Metallized Products**  
AIMCAL Conference, October 19-22, 2008



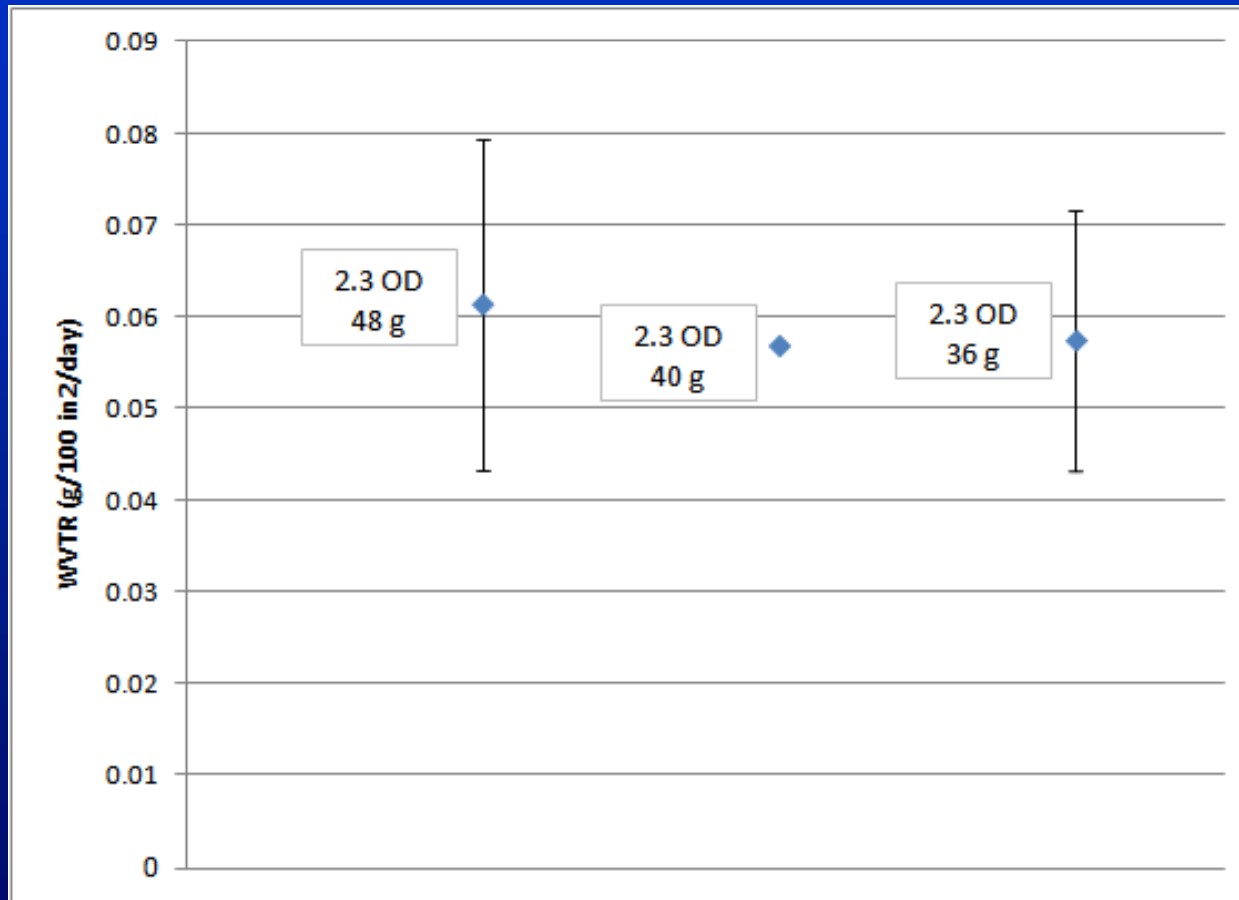
# SOURCE REDUCTION: DOWNGAUGING PET

- **Improve economics and increase sustainability by reducing the thickness of the barrier layer in your lamination**
- **The metal layer is the main driver of barrier properties**
- **The bulk PET film simply acts as a carrier to the barrier layer; its thickness has very little impact on overall barrier**

# SOURCE REDUCTION: DOWNGAUGING PET



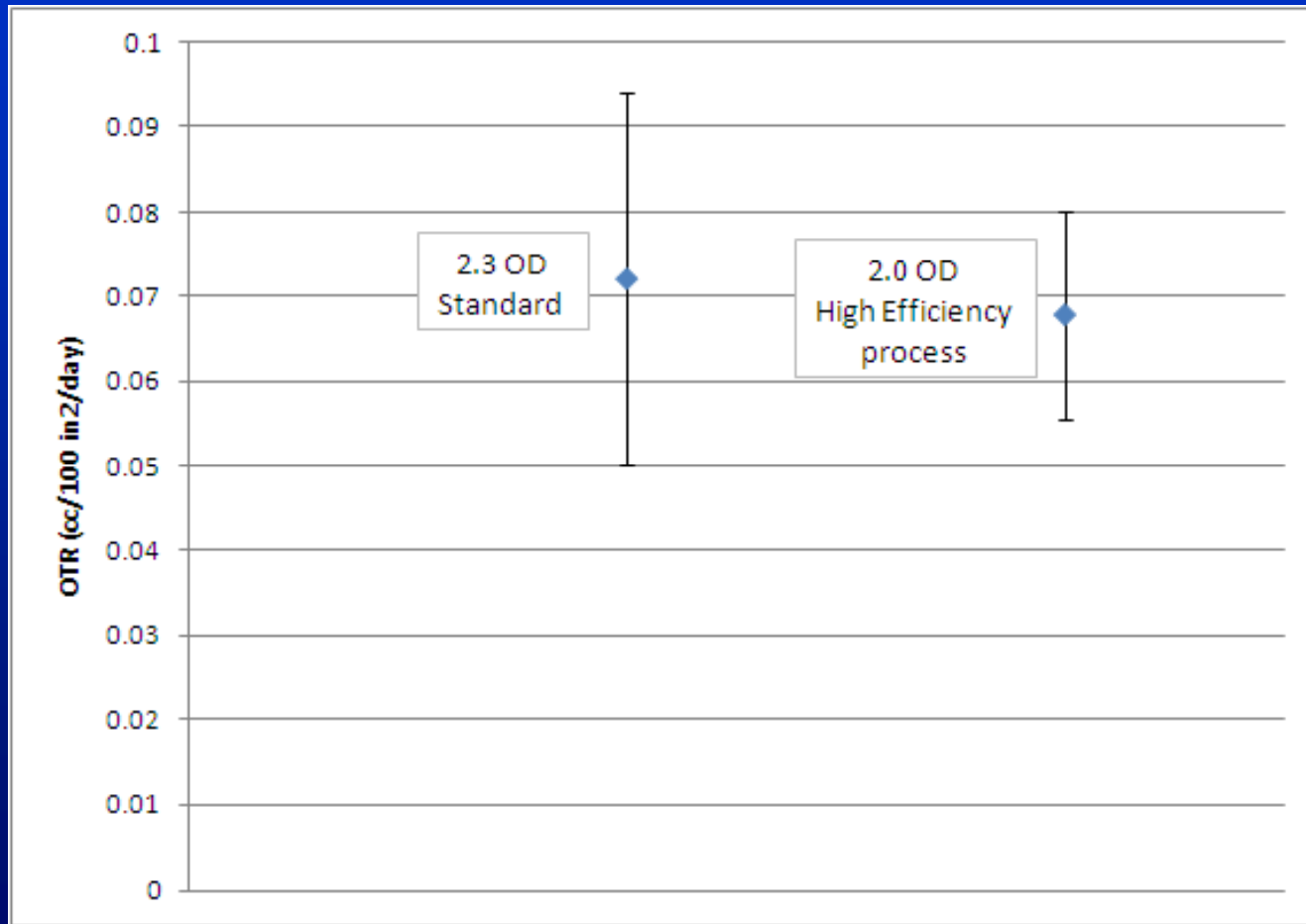
# SOURCE REDUCTION: DOWNGAUGING PET



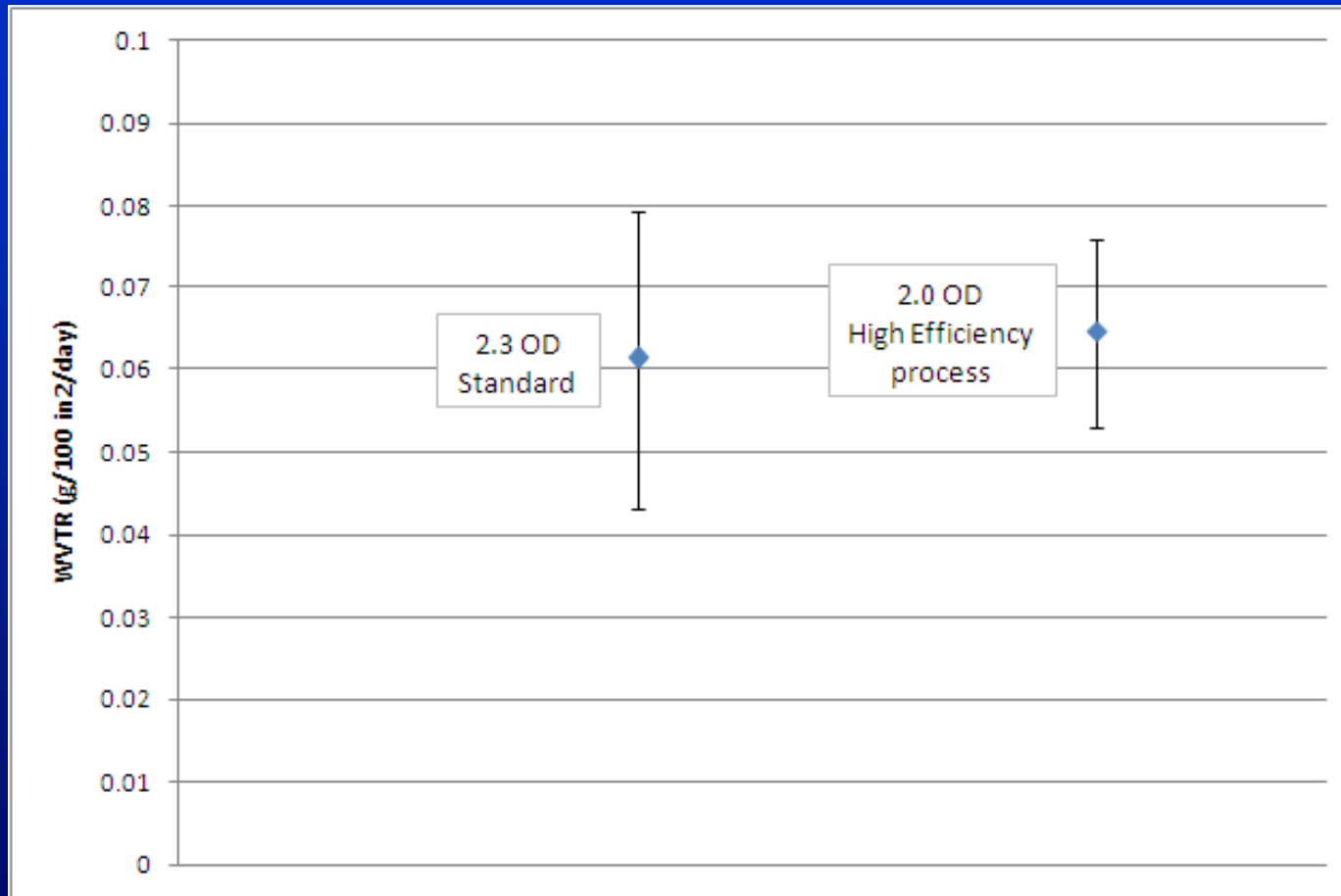
# SOURCE REDUCTION: LESS ALUMINUM

- **Improve economics and increase sustainability by reducing the thickness of the aluminum layer in your barrier film**
- **The thickness of the aluminum layer is not the whole story when it comes to barrier...more isn't always better**
- **Density, pinholes, metal adhesion and other factors also play a role**
- **Thinner aluminum layer also means less energy used in the metallizing process**

# SOURCE REDUCTION: LESS ALUMINUM



# SOURCE REDUCTION: LESS ALUMINUM



# SOURCE REDUCTION: LAYER ELIMINATION

- **Improve economics and increase sustainability by eliminating a layer in your lamination:**
  - One less film layer
  - One less lamination step
- **Layer elimination requires:**
  - Excellent sealant properties
  - Metallized OPP or PET type barrier properties
  - Excellent metal adhesion



# SOURCE REDUCTION: LAYER ELIMINATION

Metallized Sealant	Barrier Target	Typical Applications	Laminated plies being replaced	Thicknesses Evaluated (g)
1	Oxygen	Liquid packaging, fatty or oily foods	Met PET & LLDPE sealant	125 – 175
2	Moisture	Dry powder packaging, moist/wet products	Met OPP or foil & LLDPE or LDPE sealant	120 – 175
3	Moisture	Dry powder packaging, moist/wet products	Met OPP or foil & LLDPE or LDPE sealant	80 - 120

# SOURCE REDUCTION: LAYER ELIMINATION

Metallized Sealant	OTR (cc/100 in <sup>2</sup> /d)	WVTR (g/100 in <sup>2</sup> /d)	Metal Adhesion (g/in)	Sealant COF*	HSIT (F)	Ultimate Seal Strength (lb <sub>f</sub> /in)
1	0.04	0.07	400	0.16	220	>4 (destruct)
2	4.0	0.02	470	0.3 – 0.4	265	>6 (destruct)
3	4.0	0.008	>600	0.18	230	N/A

- **Laminated samples of barrier & sealant film to printed 48 g PET and OPP show barrier properties are retained in 2-ply lamination**
- **Destruct bond at the seals, with little to no metal delamination**

# OTHER ANSWERS TO SUSTAINABILITY

Presented by: **Jim Lush & Dante Ferrari**  
**Celplast Metallized Products**  
AIMCAL Conference, October 19-22, 2008



# OTHER ANSWERS TO SUSTAINABILITY

- **Energy Conservation**
  - Government programs on federal, state/provincial, and municipal/county levels
  - Investigate using outside energy specialists
  - Educate your own internal workforce

# OTHER ANSWERS TO SUSTAINABILITY

- **Collaborative efforts in the supply chain**
  - **Recycling packaging material**
  - **Warehousing vs. freight cost- which is more economical and eco-friendly**

# CONCLUSIONS

Presented by: **Jim Lush & Dante Ferrari**  
**Celplast Metallized Products**  
AIMCAL Conference, October 19-22, 2008



# CONCLUSIONS

- **Sustainability is here to stay**
- **Economics drive sustainability, not vice-versa**
- **Many possible approaches to sustainability:**
  - **Biodegradable, cradle-to-cradle films**
  - **Source reduction**
  - **Energy reduction**
- **Work with suppliers, customers, government and consulting firms to align improved profits with sustainability goals**



## Contact information:

**Jim Lush**

**Account Manager**

**Office: 416-293-4330 x-235**

**Mobile: 416-986-2424**

**Fax: 416-293-9198**

**E-mail: [jim@celplast.com](mailto:jim@celplast.com)**

**Website: <http://cmp.celplast.com>**