

# Alberta Circular Plastics Day

Alberta Plastics Recycling Association

Barriers to a plastics circular economy and reliable end markets for PCR



# VACLAV SMIL

Czech-Canadian scientist and policy analyst.<sup>[2]</sup> He is Distinguished Professor Emeritus<sup>[3]</sup> in the Faculty of Environment at the University of Manitoba in Winnipeg, Manitoba, Canada.

- ▶ Modern societies would be impossible without mass-scale production of many man-made materials.
- ▶ Four materials rank highest on the scale of necessity, forming what I have called the four pillars of modern civilization: cement, steel, **PLASTICS**, and ammonia are needed in larger quantities than are other essential inputs.
- ▶ Society has an enormous responsibility to manage plastics responsibly.

# Barriers to a greater plastics circular economy

- ▶ Policy
- ▶ Product design and engineering
- ▶ Technology
- ▶ Markets
- ▶ Product Applications (i.e.; medical)
- ▶ Waste Management Systems
- ▶ Investment

# Plastic Processing:

- ▶ Plastic processors design mechanical process lines around feedstocks
  - ▶ PE
  - ▶ PET
  - ▶ PP
  - ▶ PS
  - ▶ PVC
  - ▶ Processing other grades (ABS, Acrylic, TPE, TPO, ect.)

# Technical challenges to processing recyclable plastics:

- ▶ Multi Materials
  - ▶ Plastic products consisting of multi materials (i.e.; paper, metal)
- ▶ Multi Grades
  - ▶ Plastic products manufactured with multiple grades of plastics
- ▶ Single Source Collection
  - ▶ Increased contamination levels in the recyclable plastic

# Technical challenges to processing recyclable plastics:

- ▶ Technology
  - ▶ Sorting technology does not exist or has limited functionality
- ▶ Manual Sorting
  - ▶ A degree of manual sorting required for many plastic processes
- ▶ Change in Feedstock
  - ▶ Introduction of new plastic products to existing feedstocks

# Securing reliable end markets for PCR

- ▶ Increased recycled content in plastic products
- ▶ Manufacturing adaptation
  - ▶ Equipment
  - ▶ Technology
  - ▶ Experience with PCR
- ▶ Plastic product design for PCR (i.e.; up gauging)
- ▶ Specifications required for application
- ▶ Material conformance and quality assurance

# Examples of successful plastic circular systems:

## ▶ Beverage container deposit system

- ▶ PET Soda Bottles
- ▶ HDPE Milk Containers
- ▶ PET Water Bottles
- ▶ Other beverage containers

## ▶ Plastics from MRF's

- ▶ Beverage Containers with Deposit
- ▶ HDPE Detergent Containers
- ▶ LDPE films

## ▶ Plastic Stewardship Programs

- ▶ Oil containers
- ▶ Electronics
- ▶ Agricultural plastics



# Recommendation: continue to adapt modern day plastic systems

- ▶ Current plastics production, manufacturing, and plastic processing infrastructure was built on decades of evolution and development. These are sophisticated systems essential to modern society.
- ▶ We need to continue building on this infrastructure and adapt our systems to a full circular plastics economy.
- ▶ We do not need to reinvent the wheel.

Thank you.

Kevin Kernaghan

