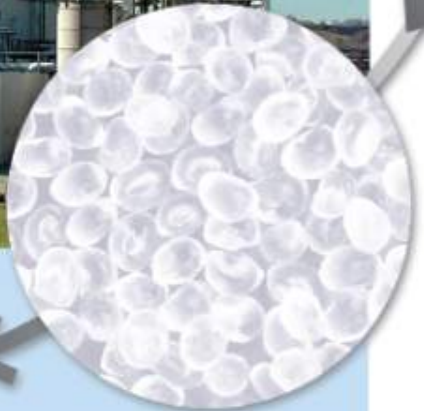


# When responsible innovation comes to everyday life.

**Christopher Ryan, PhD**  
**Chief Technology Officer**  
**[Chris\\_M\\_Ryan@natureworksllc.com](mailto:Chris_M_Ryan@natureworksllc.com)**

Ingeo™ innovations are made uniquely from NatureWorks® biopolymer.





- **Established in 1997**
- **Global stand-alone organization as a JV partnership between Cargill and Teijin**
- **Several hundred million dollar investment**
  - Unique and extensive patent position
- **World's first and largest biopolymer manufacturing facility**
  - 300 MM lb name plate capacity

Ingeo™ innovations are made uniquely from NatureWorks® biopolymer.



**ingenious**  
natural selection

**plants**  
100% annually  
renewable resources

**science**  
plant sugars  
transformed into  
NatureWorks®  
biopolymer

**environment**  
less fossil fuel  
use

**climate**  
Less greenhouse  
gas emissions

**production**  
Ingeo™ fibers and  
natural plastics are  
created

**recovery**  
more end-of-life  
options



Ingeo™ innovations are made uniquely from NatureWorks® biopolymer.



# Ingeo innovations transform plastic and fibers from a commodity cost item to a *differentiable marketing feature*.

## Serviceware



## Bottles



## Rigid Containers



## Flexible, Films & Coatings



## Consumer Goods



## Nonwovens



## Home & Office Textile



## Apparel



Ingeo™ innovations are made uniquely from NatureWorks® biopolymer.



# Consumers are concerned about the impact of their lifestyles on resources, the environment & future generations

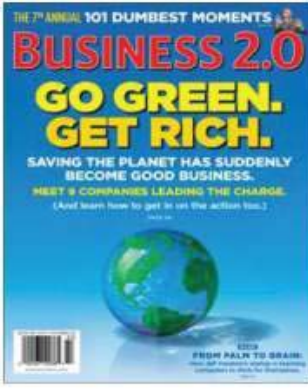
**Q: “Who should lead in minimizing the carbon footprint of the products and services you buy?”**

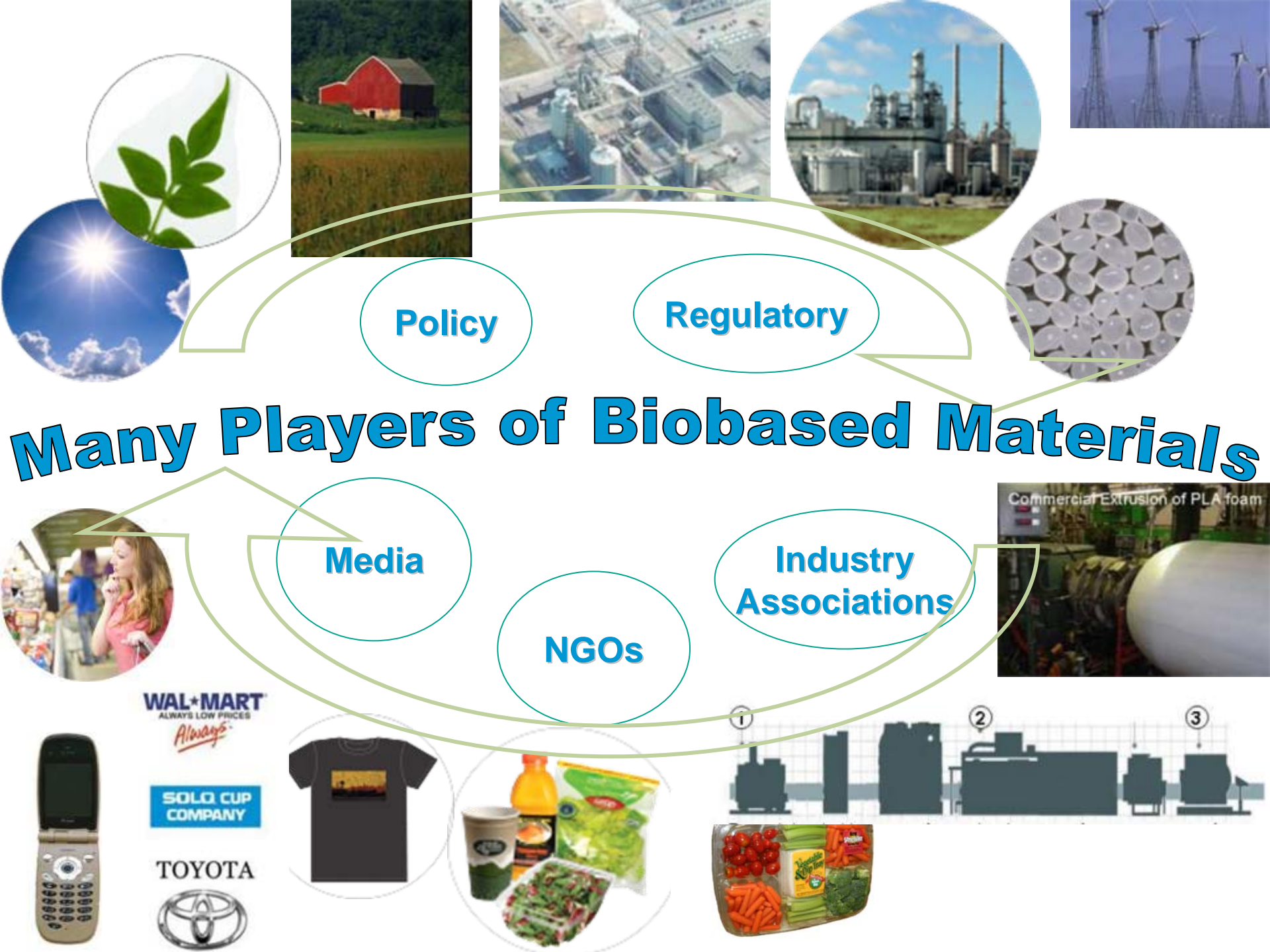
**A: 40% said manufacturers  
22% for government  
20% for consumers.**

(Source: L.E.K Consulting Group)

**43% of Americans think they will be “extremely green” in 5 years, only 11% consider themselves “extremely green” today.**

(Source: Wal-Mart Live Better Index)





## Challenges in the Journey towards a Smaller Footprint

- Hurdles to change
  - Systems have been optimized around the incumbents
- Issues Management
  - Find common ground with the variety of stakeholders
  - “Nothing’s Perfect”
- “Sustainability” Standards
  - What’s “better”?
- Continuous Improvement across the value chain
  - Feedstock to Energy to End of Product life --- many business opportunities
- People with Experience
  - Science + Environmental + “Can-do” + big picture

