

# FROM PLANTS TO PRODUCTS

## SAFER, SMARTER STUFF ... MADE IN MAINE

Plant-based materials are safer for people and the planet than those made from petroleum. Innovative Maine companies and the UNIVERSITY OF MAINE have developed new technologies to make biobased products from our forests and farms that will:

- ✓ Reduce the carbon pollution from oil that's causing our climate crisis
- ✓ Meet public demand for safer products through green chemistry
- ✓ Create good jobs in Maine that can't be shipped overseas.
- ✓ Boost Maine's rural economy by tapping our rich natural resources.

### THE SUSTAINABLE LIFE CYCLE OF BIOBASED PRODUCTS

#### FEEDSTOCKS

Sustainably harvested wood chips and agricultural waste can replace the fossil carbon in oil with renewable carbon from locally-sourced biomass.

#### SUGARS

New technology (used at Maine pulp mills) can convert wood chips into sugars, the chemical building blocks of nature.

#### BIO-BASED MATERIALS

Production of biobased plastics, chemicals and fuels means new jobs near feedstock processing sites. Cellulose (from wood) can be converted to biobased chemicals.

#### CONSUMER PRODUCTS

Maine production of sugars and biobased chemicals will help meet rapidly growing consumer demand for safer, more sustainable products.

#### END-OF-LIFE

When the useful life of a biobased product is over, it should either be composted back into soil nutrients if biodegradable, or recycled to make a new product.



ENVIRONMENTAL  
**HEALTH**  
STRATEGY CENTER

[www.ourhealthyfuture.org](http://www.ourhealthyfuture.org)



[www.biobasedmaine.org](http://www.biobasedmaine.org)

# WHAT'S DRIVING THE BIOPRODUCTS OPPORTUNITY?

Three factors are driving the double-digit annual growth rate in production of biobased materials:

- ✓ The volatile price of oil
- ✓ Consumer demand for greener products
- ✓ Sustainability goals of corporate brand owners, especially to reduce carbon footprints

## WHY INVEST IN MAINE'S BIOBASED ECONOMY?

The MAINE TECHNOLOGY INSTITUTE supports the emerging bioproducts industry. Maine offers many assets to attract biomaterials production:

- ✓ Certified sustainable forest products are a better feedstock than corn; they're not a genetically modified food crop, and emit less carbon and toxic chemicals across their lifecycle.
- ✓ Agricultural waste and fallow fields – Aroostook County still produces more potatoes than any other county in the United States.
- ✓ Idle industrial infrastructure that includes steam, power and permits, located close to feedstock sources.
- ✓ Outstanding research and development expertise and technical capacity at the University of Maine and the Composites Engineering Research Laboratory at SMCC
- ✓ A dedicated workforce and community college system
- ✓ The 'Made in Maine' brand has demonstrated value in the marketplace

## LOCAL COMPANIES ARE EARLY ADOPTERS

**TRUE TEXTILES** (Guilford, Maine) First company to market dyed woven fabric made of bioplastic polylactic acid (PLA)

**GROW-TECH** (South Portland, Maine) Has developed a biodegradable stabilized growing media using PLA

**BIOVATION** (Boothbay, Maine) Uses non-woven PLA fibers for anti-microbial food packaging, wound care, and military applications

**CEREALUS** (Waterville, Maine) Developed zein-based stain resistant coatings and agricultural mulch film

**PAPERLOGIC** (Turner Falls, Massachusetts) First commercial nanocellulose plant

**STONYFIELD FARM** (Londonderry, New Hampshire) Its multipack containers for organic yogurt are made from biopolymer

**CASCADES** (Quebec, Canada) Investing \$26 million in a biorefinery technology to extract hemicellulose (cellulosic sugars) at its pulp and paper mill

## SOME BIOBASED RESOURCES:

The Environmental Health Strategy Center  
[ourhealthyfuture.org](http://ourhealthyfuture.org)

Biobased Maine  
[biobasedmaine.org](http://biobasedmaine.org)

University of Maine Forest Bioproducts Research Institute  
[Forestbioproducts.umaine.edu](http://Forestbioproducts.umaine.edu)

Sustainable Biomaterials Collaborative  
[sustainableplastics.org](http://sustainableplastics.org)

USDA BioPreferred Program  
[Biopreferred.gov](http://Biopreferred.gov)

ICIS Green Chemicals  
[Icis.com/blogs/green-chemicals](http://Icis.com/blogs/green-chemicals)

Biodegradable Products Institute  
[www.bpiworld.org](http://www.bpiworld.org)



ENVIRONMENTAL  
HEALTH  
STRATEGY CENTER

[www.ourhealthyfuture.org](http://www.ourhealthyfuture.org)



[www.biobasedmaine.org](http://www.biobasedmaine.org)

Twitter: [@biobasedmaine](https://twitter.com/biobasedmaine)