



# Renewable Chemicals – The Future is Now!

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President and CEO**

# Renewable BioAcrylic



**\$10 Billion Global Market Opportunity**  
Direct replacement with the same properties and performance



**EDGE™**



# Renewable Chemicals – Now!



**Partnerships**

**Commercialization**

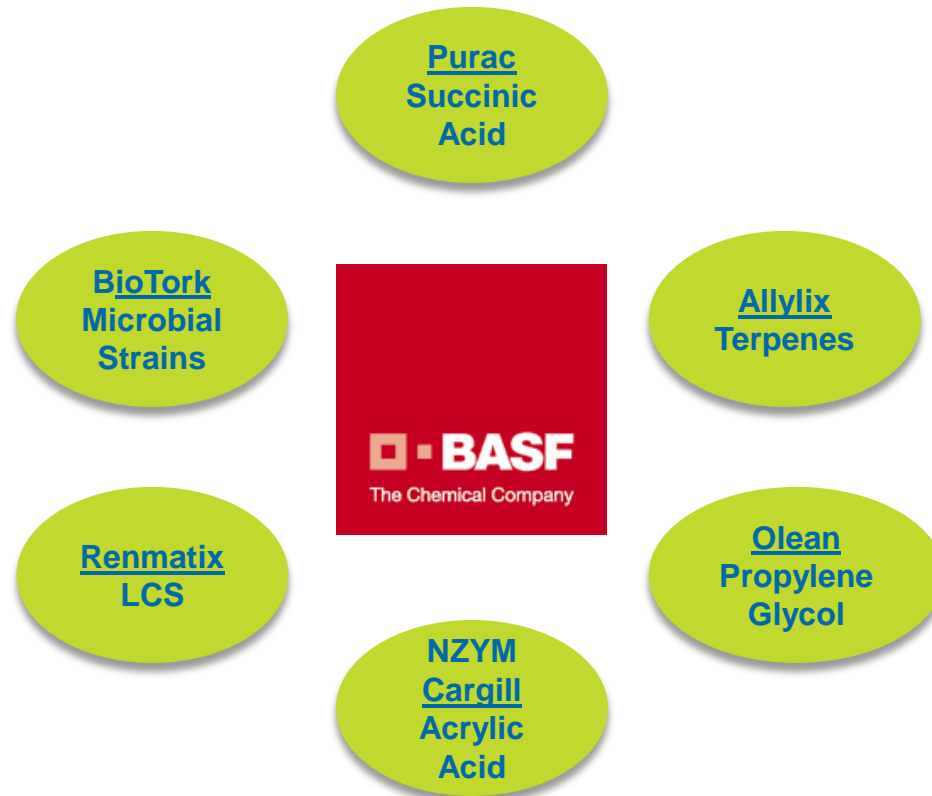
**Challenges**

# Partnerships



# Partnerships

## BASF – The “BioChemical” Company



# Partnerships

## The Dow “BioChemical” Company



# Commercial Plants

## DuPont Tate & Lyle, Loudon, Tenn.

100 million lbs. per year, 1,3 propanediol.  
Start Date: November 2006.



Figure 7: DuPont Tate & Lyle PDO Biorefinery in operation since 2006.

## NatureWorks, LLC, Blair, Neb.

140,000 tons per year PLA.  
Start Date: 2002.



Figure 13: NatureWorks PLA biorefinery, in operation since 2002.

## Gevo, Luverne, Minn.

22 million gallon per year biobutanol.  
Start Date: 2Q 2012.



Figure 9: Gevo biorefinery retrofitted for biobutanol production opened May 2012.

# Under Construction

## Myriant, Lake Providence, La.

30 million lbs per year of bio-succinic acid.  
Start Date: 1Q 2013.



Figure 12: Myriant construction progress March 2012.

## Reverdia, Cassano Spinola, Italy

10 kiloton per year Biosuccinilum™ succinic acid.  
Start Date: 4Q 2012.



Figure 17: Reverdia commercial plant under construction June 2012.

## ZeaChem, Boardman, Ore.

250,000 gallon per year acetic acid, ethyl acetate and cellulosic ethanol.  
Start Date: 2012.



Figure 23: ZeaChem demonstration biorefinery, aerial view, opened January 2012.



Figure 22: ZeaChem demonstration facility under construction, September 2011.



# BioBased Manufacturing



# Challenges



**The Future is Today**

**... And Tomorrow!**

**“People are  
going nuts!”**

Attributed to Steven Slome of Nexant  
By Melody Bomgardner, C&EN, 17Sep12



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