

# Synthetic Biology Enabled Manufacturing

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**VISOLIS**  
CARBON NEGATIVE MATERIALS

GC3 Technology Showcase  
May 7, 2019

# Platform Applications

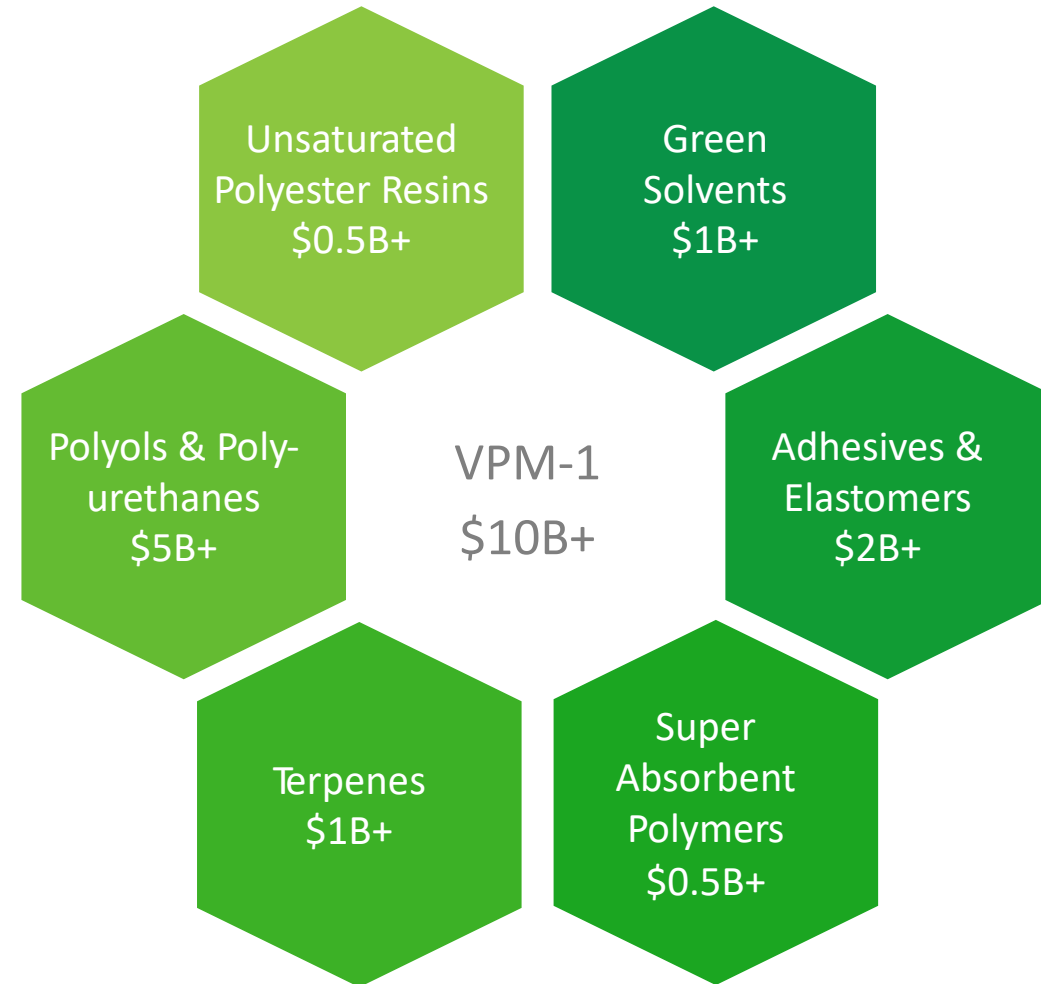
Our first platform molecule (VPM-1) can reach broader opportunities exceeding \$10 billion in market size

## Our Base Platform

- » Poly-functional molecule
- » Cost-competitive
- » 100% bio-based
- » Offers drop-in replacements and new chemical offerings

## Raw Materials

- » Sugars
- » Biomass (corn, waste, glycerol)
- » Syngas from fossil sources or renewable electricity (future)

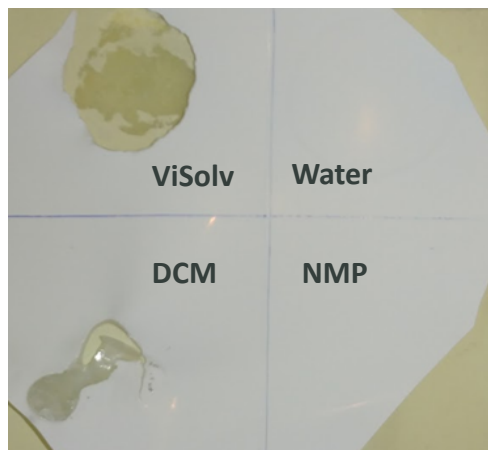


# Application Examples from VPM-1

## New Green Solvent and Drop-In Building Block Molecule

### New Green Solvent with Performance Advantages

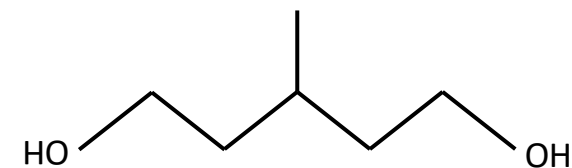
- » **Aggressive Solvent:** Similar to Dichloromethane (DCM) and N-Methyl Pyrrolidone (NMP) in Hansen solubility space
- » Can **dissolve high performance polymers** like PES, PAN, PVC, Polycarbonate
- » New application potential in **polymer recycling and processing**



- 50 ul of ViSolv, NMP, DCM and water were spotted on a PES membrane for 10 sec.

- ViSolv rapidly dissolves the membrane relative to other solvents.

### Bio-Based Diol Offering Drop-In Replacement



- » **MPD (3-Methyl-1,5-pentanediol)** is low viscosity liquid C6 diol
- » Used in production of **specialty inks, coatings and performance adhesives**
- » **Limited market supply** due to expensive production via traditional petro-chemical routes
- » Visolis technology enables **less costly, new bio-based route**

Over 10 other bio-based chemicals currently in the portfolio!

# Scale-up: Concept to Commercial Production in 2 Years

Stage A (R&D)

Stage B (Scale up)

Stage C (Commercial)

500ml  
Lab Scale



✓ Yield

5L Scale



✓ Titer  
✓ Productivity

2016-17  
Pilot/demo scale  
0.3-9 kL, 100ton/yr



✓ Process validation  
✓ Launch Application 1  
(fine chemical)

2018-2019  
Small commercial volumes  
50-200kL, 500-2000 ton/yr



✓ JV partnership  
• Launch Application 2  
(specialty chemical)

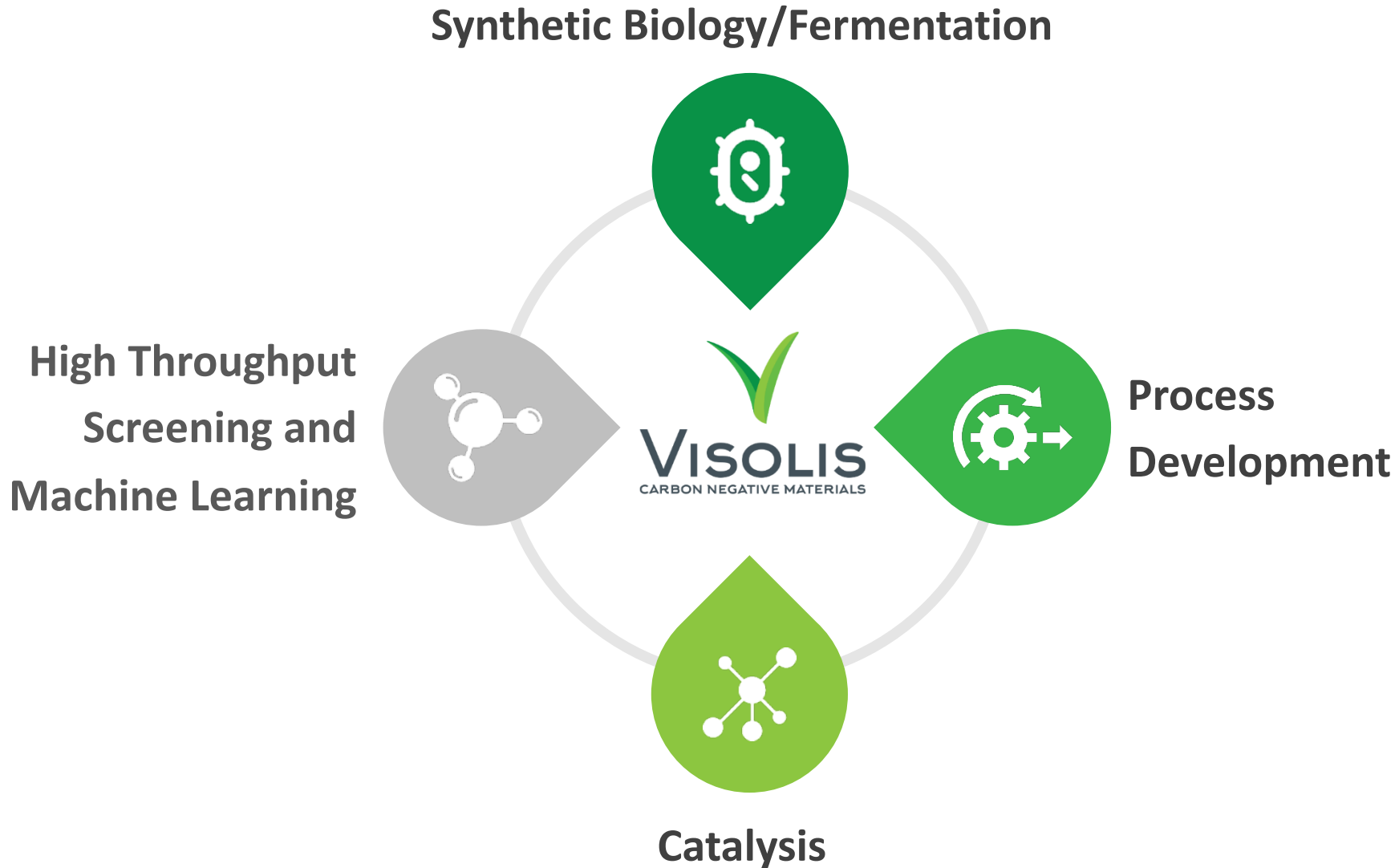
2020 onwards  
World-scale production  
3M Liter, 30,000 ton/yr



- Visolis JV to own and operate world scale bio-chemicals plant in Sarnia, ON
- Launch Application 3 (bulk chemical and other usage)

Shipping kilogram sample quantities globally!

# Technology



# Grants, Awards & Investments

\$15 Million in total funding till date and more in pipeline

## Grants



## Awards



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