# BARRIERS TO GREEN CHEMISTRY ADOPTION AND MEANS TO ACCELERATE GROWTH ALONG THE SUPPLY CHAIN

A report commissioned by the Green Chemistry and Commerce Council

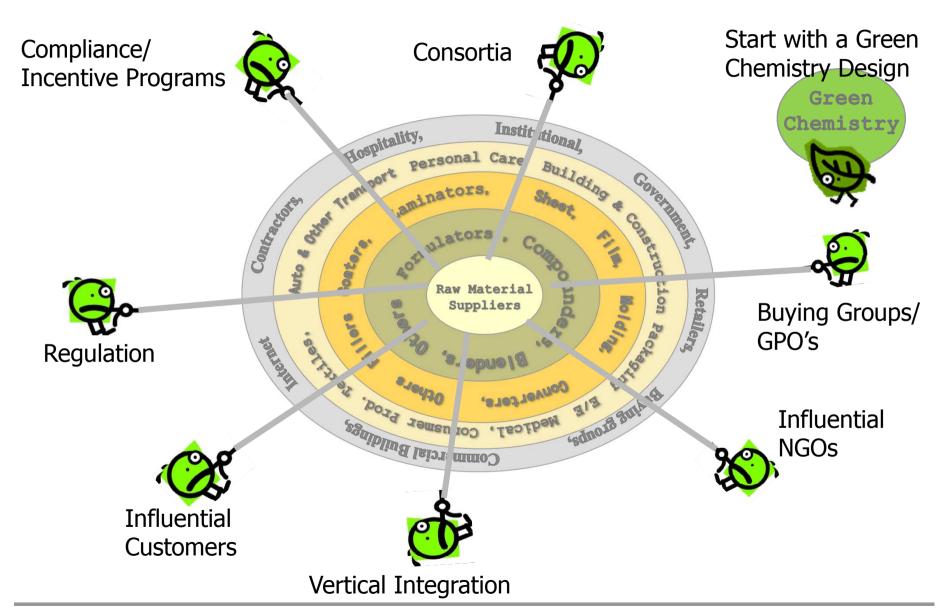
Presented April 28, 2015 at the GC3 Innovators Roundtable

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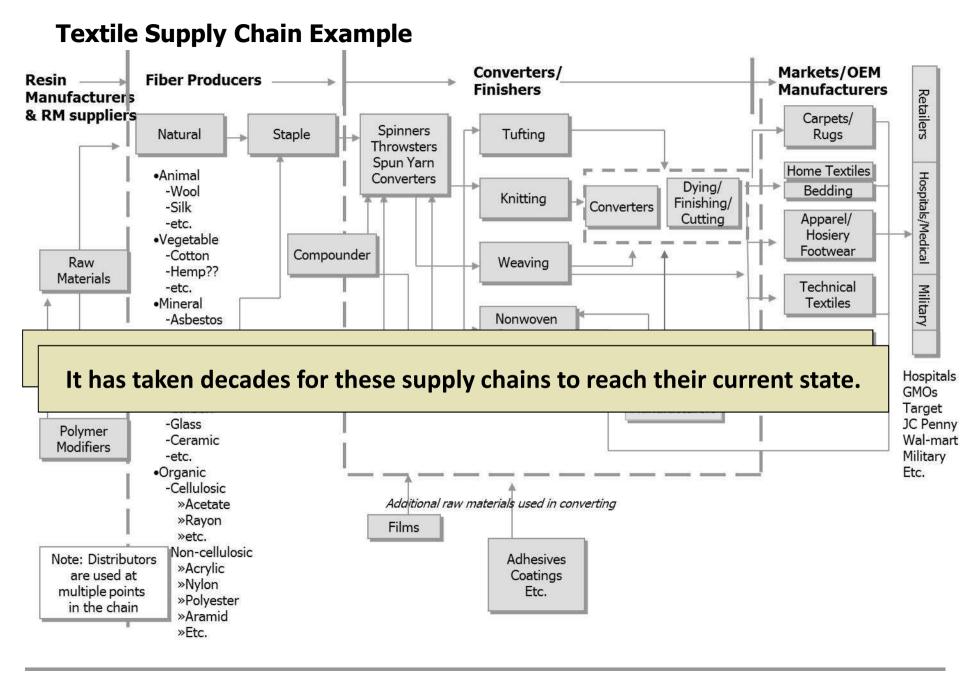
1. Why isn't green chemistry in wider use?

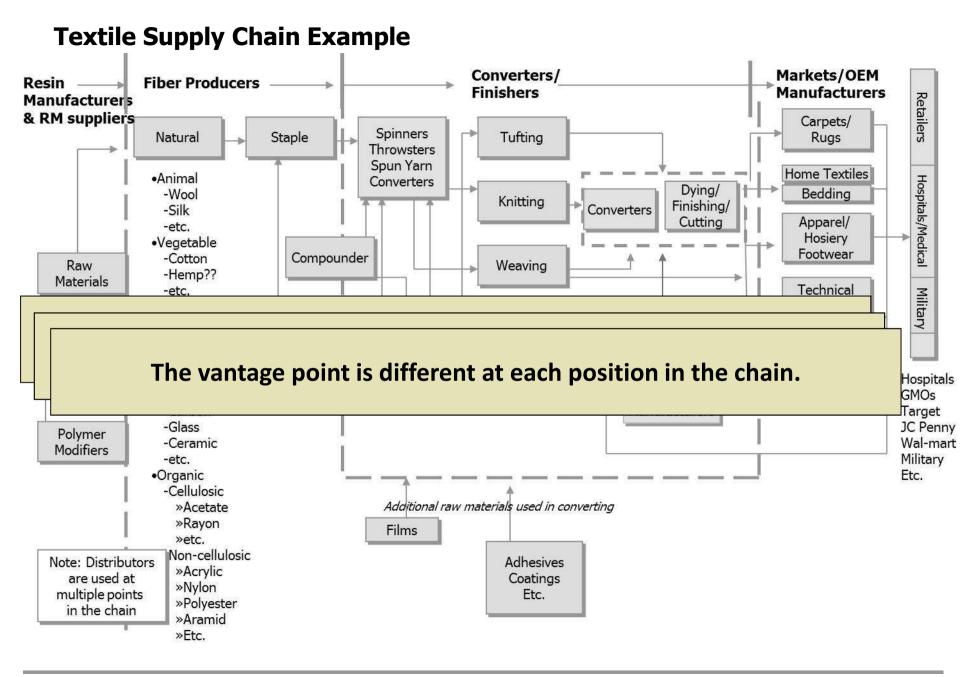
2. What is the means to accelerate availability and adoption?

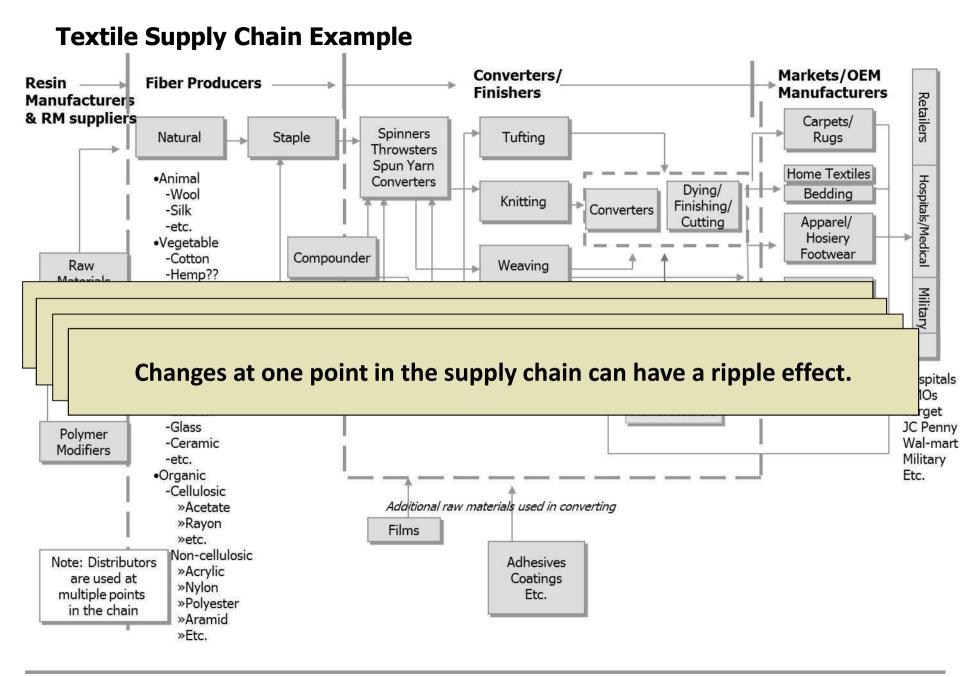
### Despite efforts to accelerate green chemistry use, adoption rates remain low.

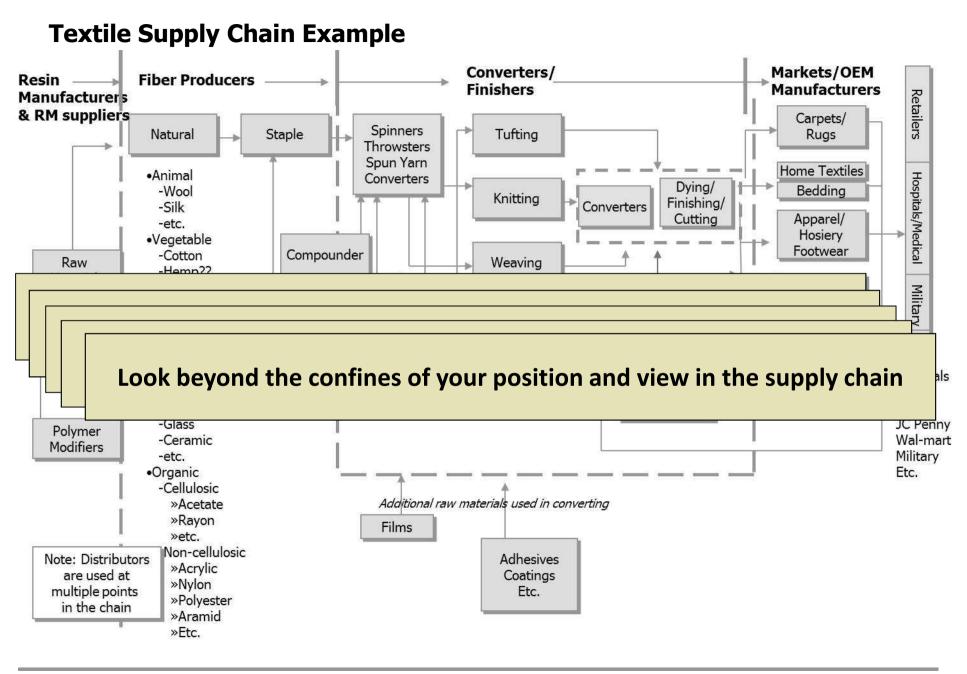


#### **Textile Supply Chain Example** Converters/ Markets/OEM **Fiber Producers** Resin Manufacturers **Finishers** Retailers Manufacturers & RM suppliers Carpets/ Spinners Staple **Tufting** Natural Rugs Throwsters Spun Yarn Home Textiles Animal Hospitals/Medical Converters Dying/ Bedding -Wool Knitting Finishing/ -Silk Converters Cuttina Apparel/ -etc. Hosierv Vegetable Footwear Compounder -Cotton Raw Weaving -Hemp?? Materials Technical Military -etc. Textiles Mineral Nonwoven -Asbestos Converters Continuous Auto Man-made Filament Yarn Hospitals Supply chains are layered and complex. **GMOs** Target JC Penny -Glass Polymer -Ceramic Wal-mart Modifiers Military -etc. Organic Etc. -Cellulosic Additional raw materials used in converting »Acetate »Rayon Films »etc. Non-cellulosic Note: Distributors Adhesives »Acrylic are used at Coatings »Nylon multiple points Etc. »Polyester in the chain »Aramid »Etc.



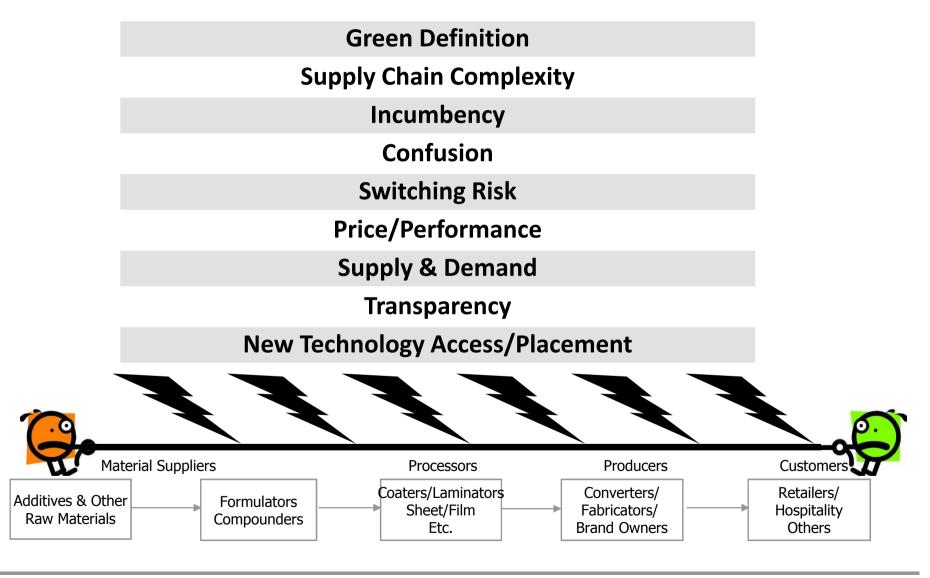




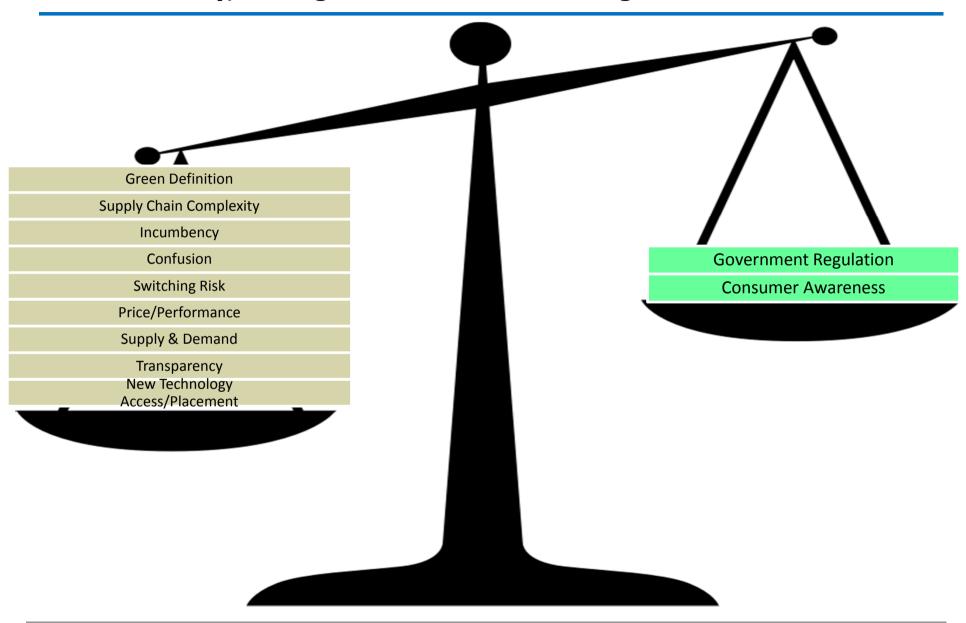


#### **Textile Supply Chain Example** Markets/OEM Converters/ **Fiber Producers** Resin **Finishers** Manufacturers Retailers Manufacturers & RM suppliers Carpets/ Spinners Staple **Tufting** Natural Rugs Throwsters Spun Yarn And before you begin green chemistry discussions, define what you mean by green chemistry IT ISN'T ESSENTIAL TO PICK A "RIGHT" DEFINITION. IT IS ESSENTIAL TO BE ON THE SAME PAGE. als JC Penny -Glass Polymer -Ceramic Wal-mart Modifiers Military -etc. Organic Etc. -Cellulosic Additional raw materials used in converting »Acetate »Rayon Films »etc. Non-cellulosic Note: Distributors Adhesives »Acrylic are used at Coatings »Nylon multiple points Etc. »Polyester in the chain »Aramid »Etc.

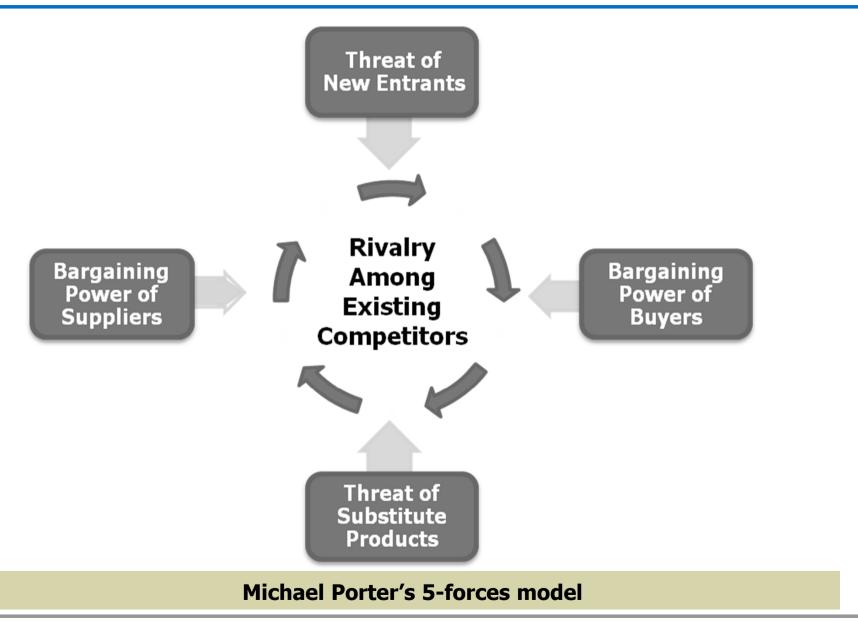
# TFA Identified 9 key issues that misalign the supply chain and slow green chemistry adoption



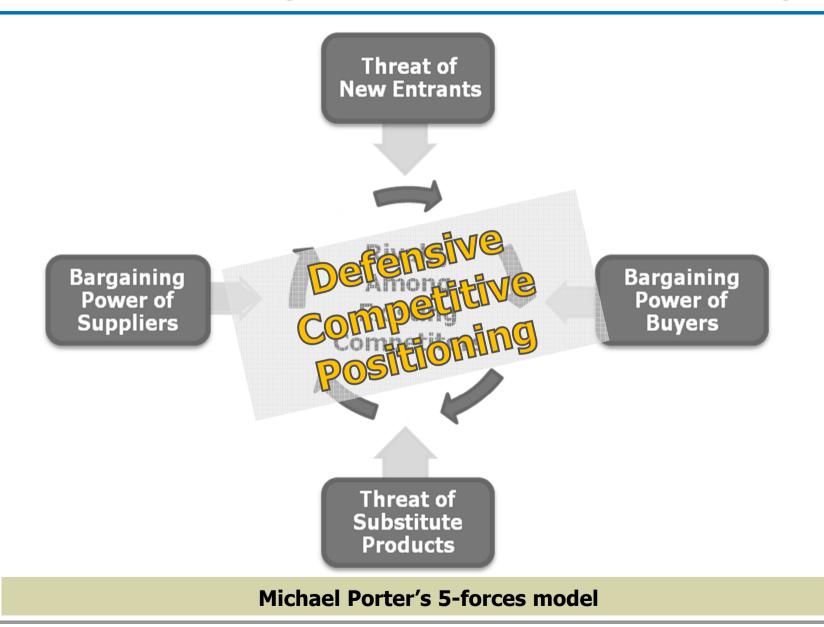
### Currently, misalignment issues far outweigh the main drivers



# Traditional thinking drives behavior and decision making...

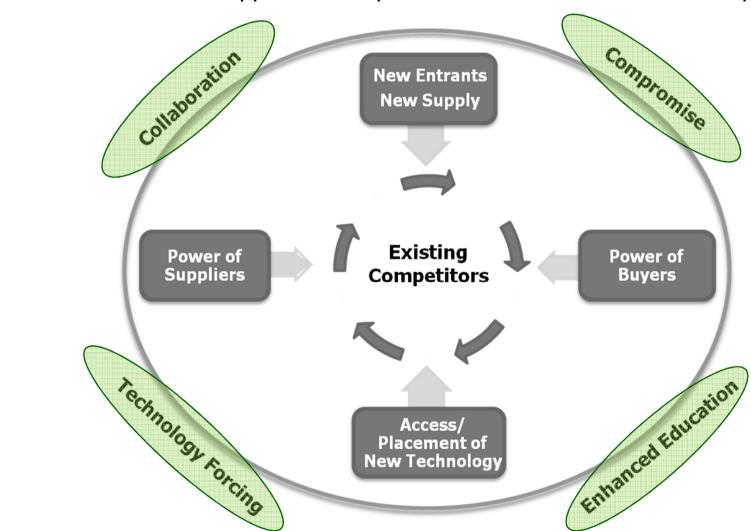


# Traditional thinking drives behavior and decision making...



# ...but models can be adapted for beneficial change

- We've identified four green chemistry accelerators
- These tools can be applied to cooperative efforts based on 5-forces principles



# **Accelerator: Collaboration**

# **COLLABORATION**

Provides a way to close the gap between what players in the supply chain say they want and what others in the supply chain can deliver.

# **Accelerator: Compromise**

# **COMPROMISE**

Acceptance of the notion of continuous improvement.

A starting point, not the ultimate goal, but a step in the right direction.

# **Accelerator: Technology Forcing**

# TECHNOLOGY FORCING

Decision makers with "buyer power" force change.

In effect, they create de facto regulations.

# **Accelerator: Enhanced Education**

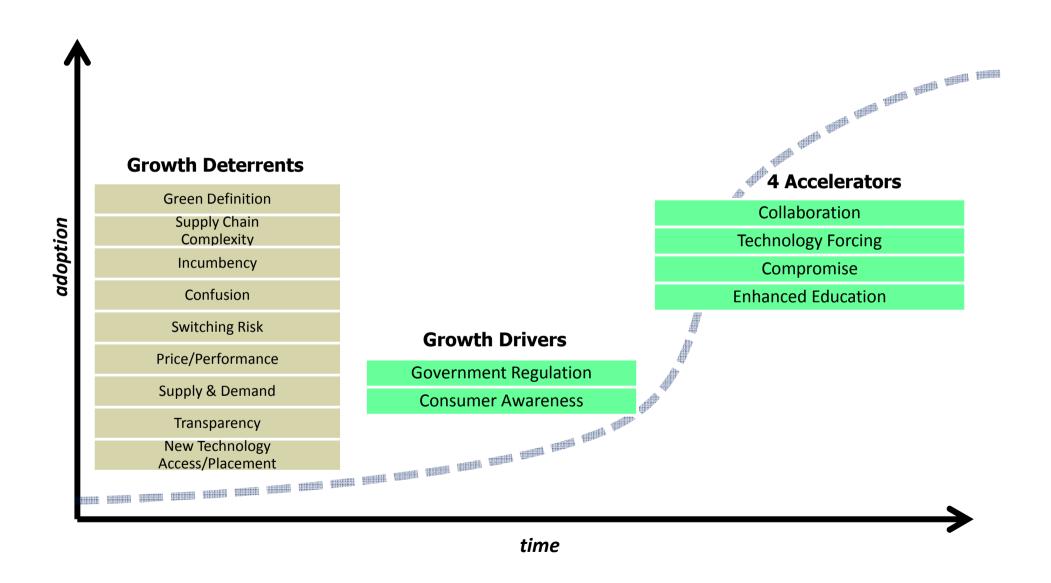
# **ENHANCED EDUCATION**

Better educated consumers can accelerate demand for green chemistry.

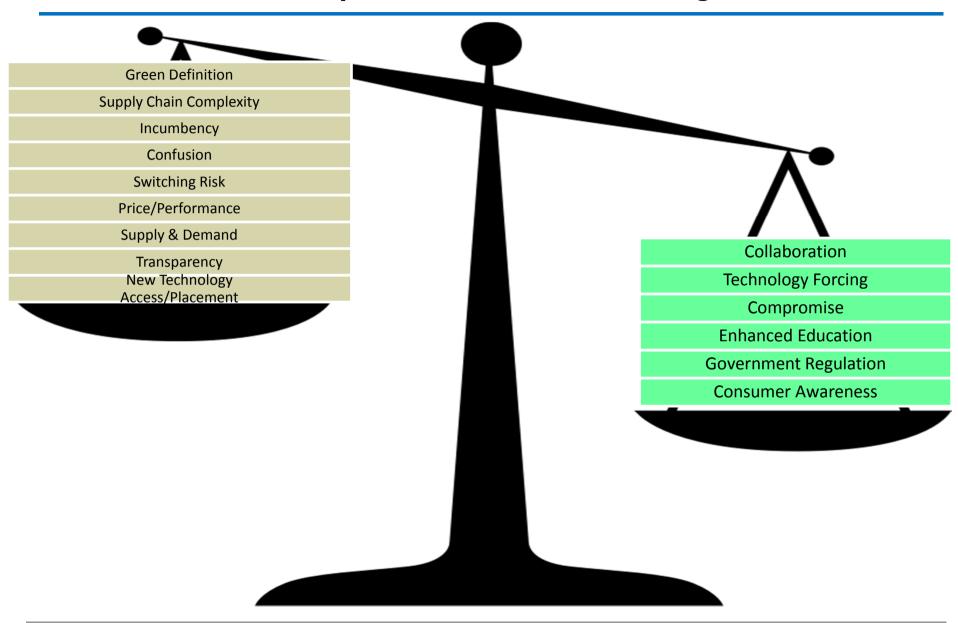
A workforce better trained in green chemistry can accelerate adoption.

Starting with a green chemistry design is the fastest way to accelerate adoption.

### The four accelerators should be part of the toolbox to drive change



### And can tip the balance in favor of change...



#### To access the full report:

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please refer to the GC3 website

http://www.greenchemistryandcommerce.org/

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