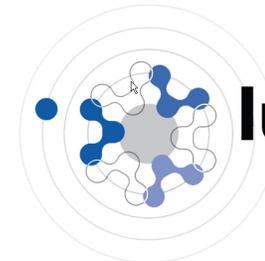


# Materials 2030: Building a digital bridge to tomorrow's business model

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Analyst

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**lux** executivesummit

Tokyo • October 17 - 18, 2017

## Starting off with a bold prediction...

### Most produced chemicals today

Sulfuric acid  
Nitrogen  
Ethylene  
Oxygen  
Propylene

### Most produced chemicals 2030

Sulfuric acid  
Nitrogen  
Ethylene  
Oxygen  
Propylene

# Agenda

- 1 Materials and chemicals industry under pressure
- 2 Understanding the role of digital transformation
- 3 The new materials business model

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**1** **Materials and chemicals industry under pressure**

2 Understanding the role of digital transformation

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# Commoditization is an inevitable force cutting into margins

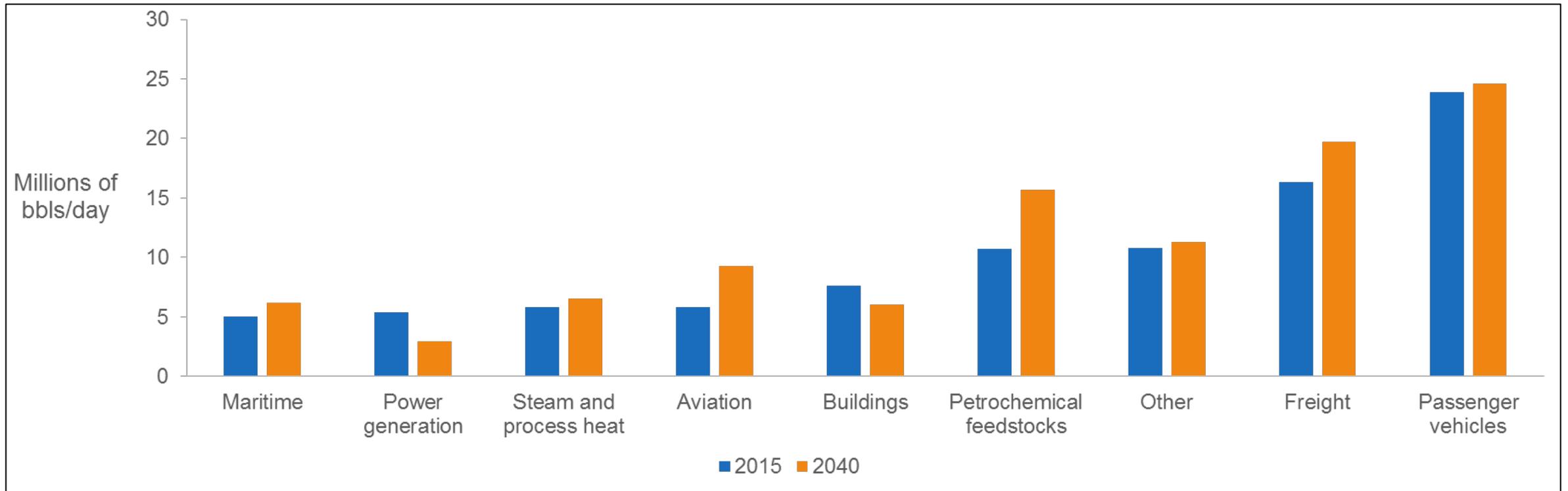
transitive verb

**1** : **COMMODYFY** <commoditizing bandwith>; *specifically* : to render (a good or service) widely available and interchangeable with one provided by another company

- Commoditization is the result of new technologies, new competition, and new business models

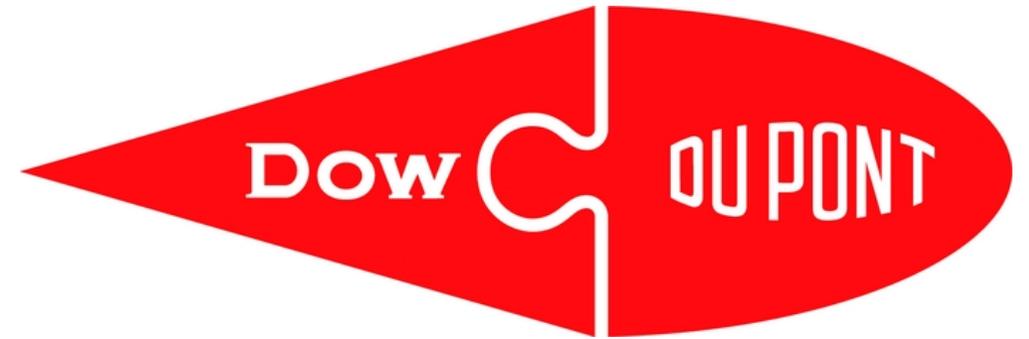


# Long-term low oil prices demand cut into top-line revenue growth



Oil demand is slowing across almost every sector, ensuring low prices

# Megamergers push efficiency and the benefits of scale operation – but what if you are on the outside?



# More consumer awareness impacts the types of materials chemical companies can sell

**theguardian**

Dunkin' Donuts to remove titanium dioxide from donuts



healthline

## What is BPA and Why is it Bad for You?

# New ways of using materials create opportunity – for those flexible enough to grasp it

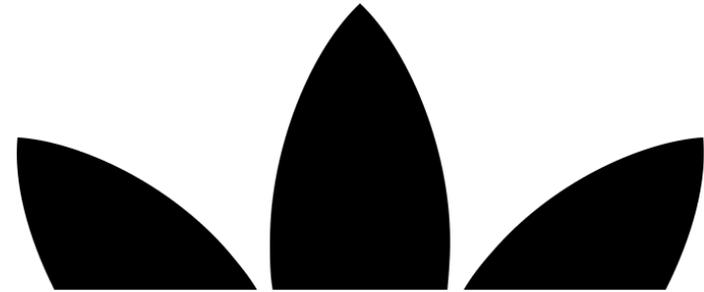


We create chemistry



New ways of using materials create opportunity – for those flexible enough to grasp it

**The Washington Post**



**Surging Adidas overtakes Jordan Brand for No. 2 spot behind Nike in U.S. sneaker sales**



# New demands for specialties create opportunity for material and chemicals companies



# The materials and chemicals industry faces a monumental task

How can the materials and chemicals industry flexibly meet the needs of the future while improving the profitability and efficiency of its businesses?

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## Digital transformation gets talked about a lot....



how blockchain will



how blockchain will **change organizations**

how blockchain will **change the world**

how blockchain will **change everything**

how blockchain will **change banking**

how blockchain will **change your life**

how blockchain will **radically transform the economy**

how blockchain will **change finance**

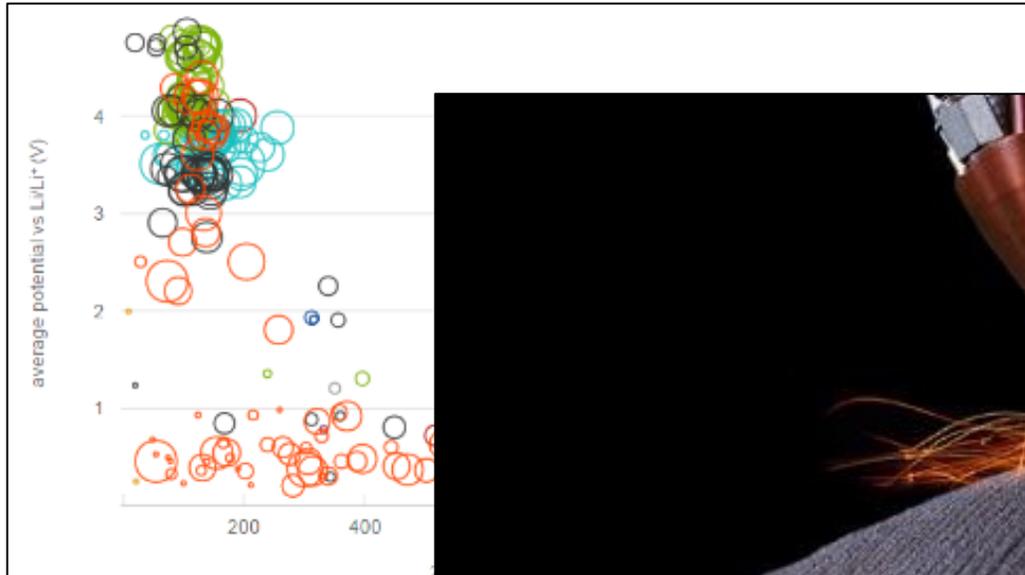
how blockchain will **change accounting**

how blockchain will **change**

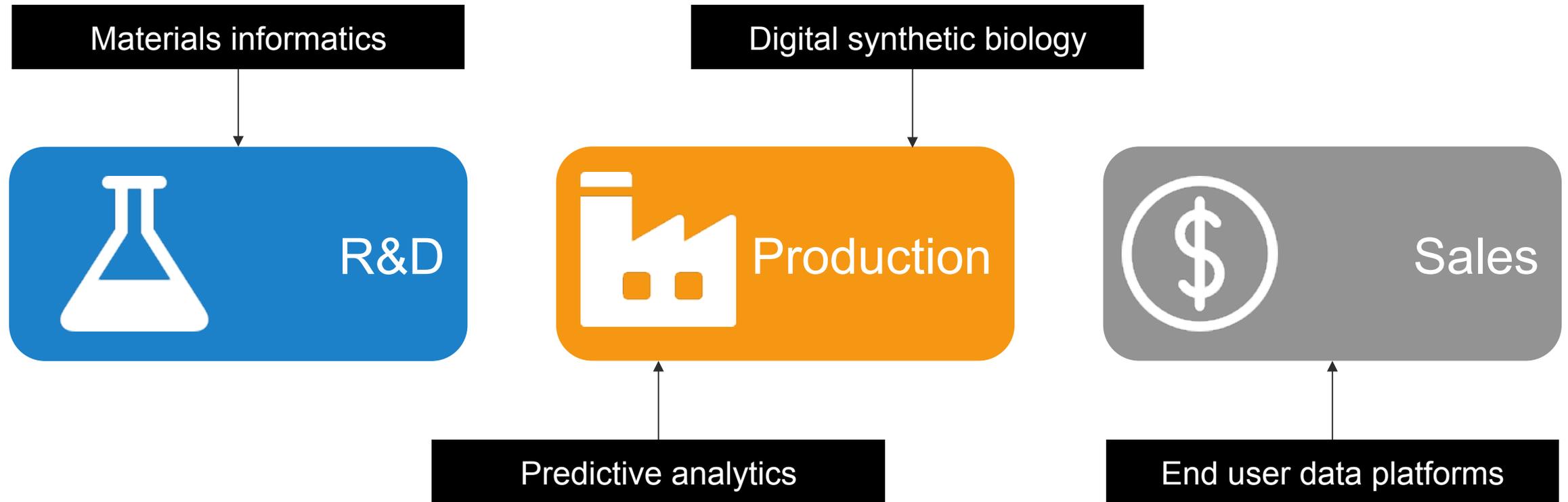
how blockchain will **change organizations pdf**

# Digital transformation is different for each industry

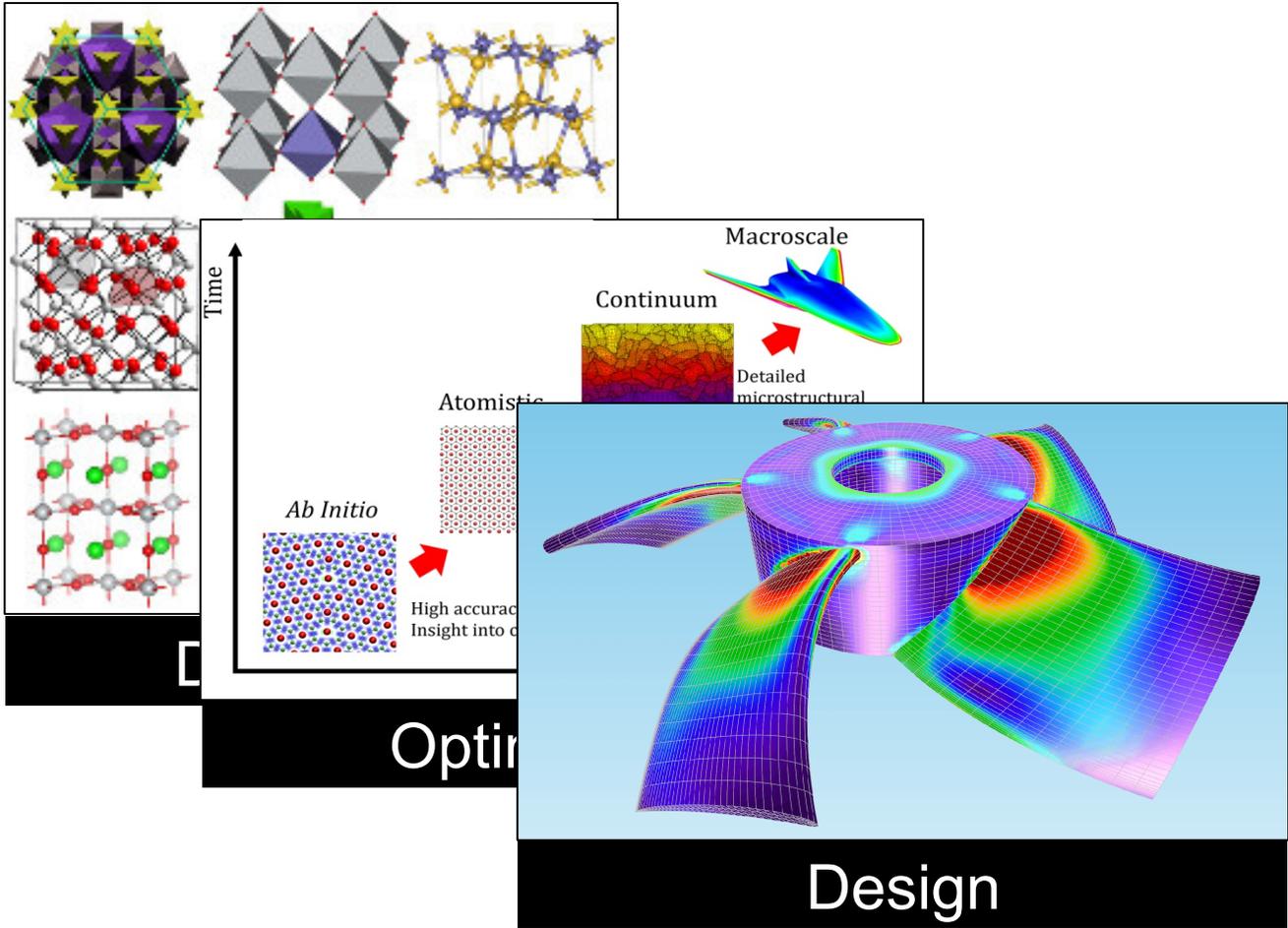
- Digital technologies from advanced machine learning techniques to mature e-commerce practices are all part of digital transformation



# Digital transformation touches every part of the chemicals and materials industry



# Materials informatics is rapidly accelerating the process of R&D



Tilde



Citrine



# Product formulation will be the most profoundly impacted



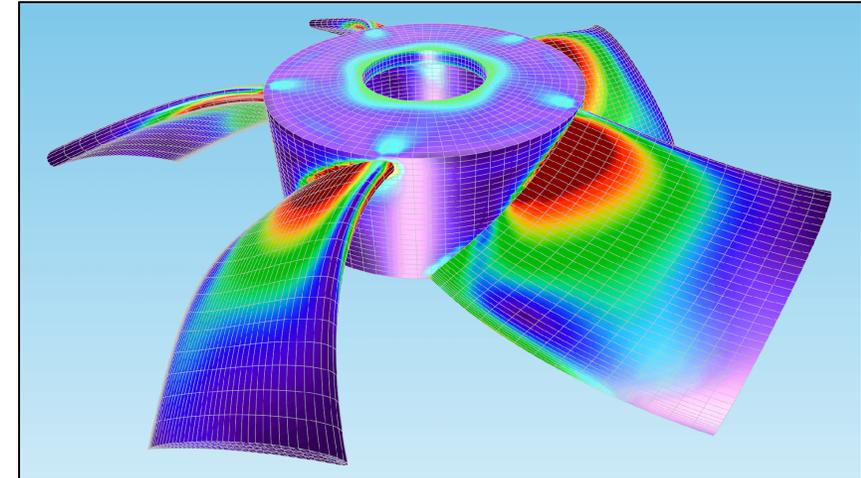
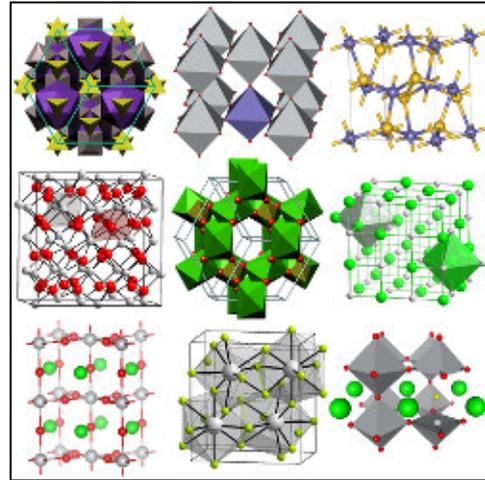
Major supplier of rubber and plastic components to the automotive industry



Uses AI and multidimensional modeling to propose formulations with targeted properties

Initial trials cut formulation time in half after only two months of work

# R&D transformation will enable customized materials for more and more products



The development of digital materials design enables integration with digital product design

# Digital manufacturing will enable new production to be optimized like established commodities



We create



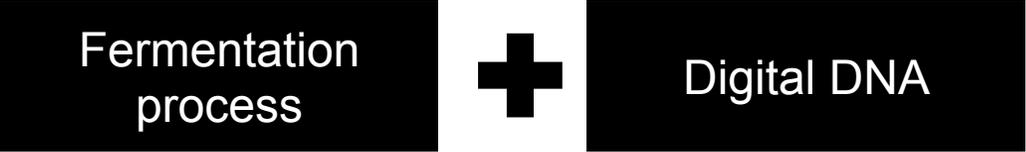
A combination of s



**EVONIK**  
POWER TO CREATE

Evonik uses data analytics to understand and prevent fluctuations in processing parameters that negatively impact final material properties

# In the long term, digital synthetic biology turns chemical plants into platforms for specialties



# Platform production can save upfront capital expense and enable scalability for manufacturers



## Become a Partner

At Amyris, we're advancing the bioeconomy at an unprecedented rate as a leader in innovation. Partnering with Amyris drives product innovation and delivers consistent, low-cost supply for your products faster than ever, ensuring your competitive edge.

## Your partner in Bioengineered Manufacturing

SEE BETTER PRODUCTS

Novel production platforms allow manufacturers to test, source, and scale new materials

# Digital sales channels have already enabled better penetration, lower overhead, and ease of growth in commodities businesses



Online sales platform simplified ordering, manufacturing, logistics and delivery

Founded in 2002

Partnered in 2015 to sell BASF's chemicals to SMEs in China



# Now digital platforms have begun to re-write the established roles in the specialties sales cycle



**FARMERS**<sup>SM</sup>

**BUSINESS NETWORK**

Aggregated farmer-shared data platform allows farmers to make better decision about fertilizers and pesticides

“Farmers have previously relied of the advice of seed companies and sales agronomists at the retail level. **With FBN, farmers can crowdsource real-world field trial results and use that data to drive decisions.**” – FBN CEO Charles Baron

# Manufacturers and end users will be empowered to play a new role in the sales process



The data driven decision-making tools developed in the agriculture space can be applied across any type of product

# Digital transformation will enable the materials and chemicals industry to meet needs of efficiency, profitably, and flexibility



Digital transformation enables faster, more efficient product development and manufacturing

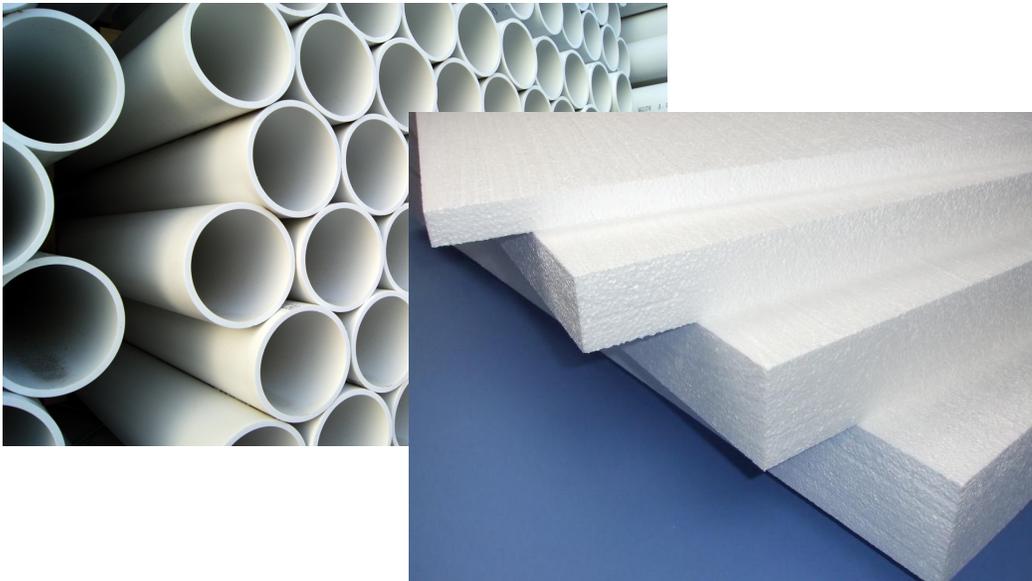
Digital transformation enables mass customization and targeted sales

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# The old materials and chemicals business model had a split

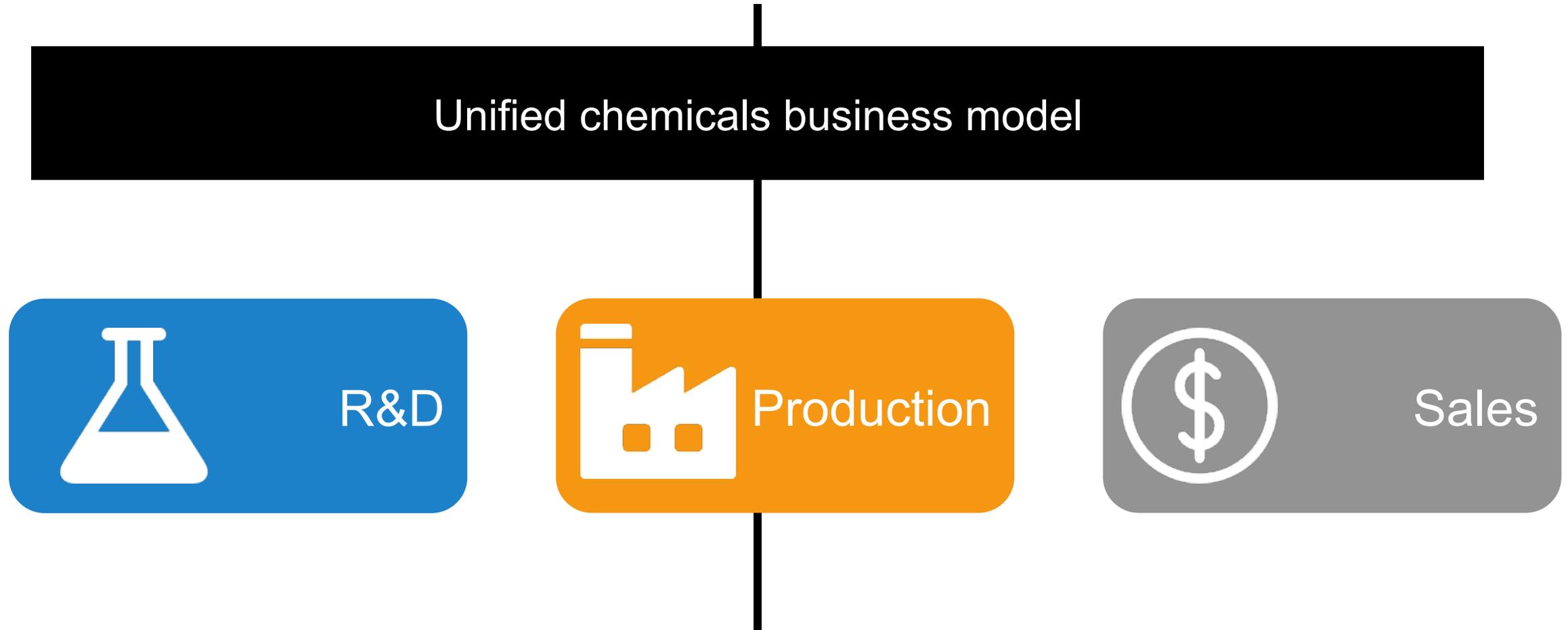
## Commodities



## Specialties



# The old chemicals and materials business model – with a split between commodity and specialty materials – will erode



# How are leaders responding to this transformation?



Tilde



Citrine



Panasonic



HYUNDAI



Get ahead of shifts in decision making

 **BASF**

We create chemistry



  
**Alibaba.com**

Invest in critical technologies

Form partnerships to fill gaps

## Things are changing.....

- Digital transformation will allow materials companies to improve efficiency while meeting specialized needs – benefiting manufacturers as well
- Identify the role that materials informatics will play in automating complex parts of the materials and chemicals design cycle
- User data will be hugely impactful in the sales cycle – everyone in the value chain needs to understand this opportunity
- Reexamine your organization's skills across all roles so they can operate in a digital structure