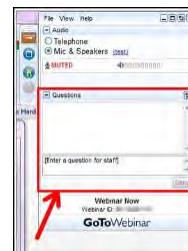




Have Questions?



Type them into questions box!

“Why am I muted?”

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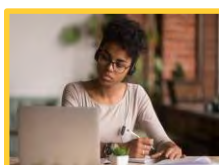


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Every 6 months we are joined by our resident expert economist, Paul Hodges for a survey of the chemical industry. Take a look back at the rises and falls in the economy and gain an understanding of what underlying forces are driving the market.



Chemistry and the Economy: 2020 Mid-Year Update
Paul Hodges of International E-Chem and Bill Carroll of Carroll Applied Science have their bi-annual discourse regarding the chemical market and what companies can do to adapt in these difficult times including COVID-19.



Chemistry and the Economy: 2020 Outlook
Join Paul Hodges of International eChem and Bill Carroll of Carroll Applied Science for an update of what has been affecting the chemical market and what might be coming down the pipeline in 2020.



Chemistry and the Economy: 2019 Mid-Year Update
Paul Hodges of International eChem and Bill Carroll of Carroll Applied Science share an update of what has been affecting the chemical market and what companies can do to adapt to this changing world in 2019.



Chemistry & the Economy: 2019 Outlook
Paul Hodges of International eChem and Bill Carroll of Carroll Applied Sciences will provide an update of what has been affecting the chemical market and what companies can do to adapt to this changing world in 2019.



Featuring



Paul Hodges
Chairman,
International eChem

Blog Posts by Paul on Industry Voices

- What are the best renewable, green solutions for our industry? Let me hear from you!
- Would a Pfizer-Allergan deal spell bad news for the industry?
- Staying Warm through the "China Chill": Threat of Winter allows petrochemical industry to Spring forth new business models
- Commodities Bubble, Oil in Trouble: China's Economic Slowdown Could Mean a "Crude" Awakening for the Petchem Industry

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How to Recognize and Respond to Microaggressions

Rebroadcast

Date: Wednesday, June 9, 2021 @ 2-3pm ET
Speaker: Fatima Dainkeh, She+ Geeks Out
Moderator: Paula Christopher, American Chemical Society

Register for Free!

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- What a microaggression is, looks like, and how it manifests
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Bioinspired Nanomaterials
From Discovery to Market Pipeline

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Speakers: Siddharth Patwardhan, The University of Sheffield (UK)
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- Why the understanding bio-nano interface is a powerful basis for designing bioinspired syntheses of functional nanomaterials
- How careful design of bioinspired nanomaterials can provide commercially relevant products
- Why process chemistry, scale-up and downstream processing are equally important in reaching the markets

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Lithium-ion Batteries
The Road to Sustainable Energy Storage

ACS President H.N. Cheng Presents: FRONTIER FRIDAYS

Date: Friday, June 11, 2021 @ 1-2pm ET
Speakers: Amy Prieto, Colorado State University and Prieto Battery, Inc. and H.N. Cheng, ACS President
Moderator: Young-Shin Jun, Washington University in St. Louis

Register for Free!

What You Will Learn:

- Why battery chemistry is complex and interdisciplinary
- How the iteration of synthesis, characterization, and modeling is key for accelerating discovery
- Why there is no one perfect battery for every application

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Chemistry and the Economy

Supply Chain Woes and is Industry "Sprouting" Green?



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Chemistry and the Economy: Supply Chain Woes and is Industry "Sprouting" Green?



PAUL HODGES
Chairman, New Normal Consulting



BILL CARROLL
Founder, Carroll Applied Science

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New Normal is a Swiss-based strategy consultancy advising Fortune 500 and FTSE 100 companies, investment banks and fund managers.

Our consulting work focuses on the major paradigm shifts taking place in the global economy as a result of today's ageing populations



DEMAND PATTERNS: The lockdowns have broken down the inertia surrounding work and home-based routines. Travel, leisure, construction, real estate and other industries will likely see major change as a result.



RESHORING SUPPLY CHAINS: Global supply chains have proved very fragile during the pandemic. They have collapsed not only because of the uncoordinated nature of the lockdowns around the world, but also due to volatility in demand patterns.



ENERGY ABUNDANCE: Q2 2020 provided a taste of the world to come. The issue is that it now makes economic sense in some regions to 'scrap and build' – scrap older, fossil fuel-based infrastructure, and replace it with modern renewable-based power sources.



CIRCULAR ECONOMY: The need to reshore supply chains in a world of potential energy abundance suggests that moves towards a circular economy will accelerate. We need new business models to be created, covering the entire value chain from collection to resale.



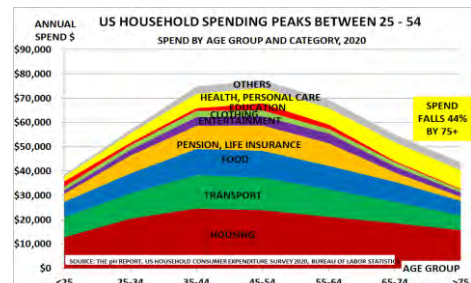
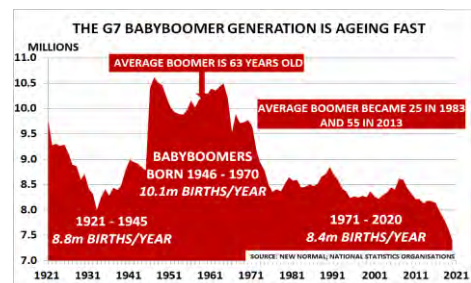
ADVANCED MANUFACTURING: Many manufacturing operations still operate as they would have done 50 years ago. It makes no sense to reshore using centuries-old equipment when digital, continuous & biotech-enabled technology is safer, **greener**, faster and cheaper.



Paul Hodges is a trusted adviser to major companies and investors. He publishes The pH Report, and serves as chairman of NiTech Solutions and of the Advisory Board of Infinity Recycling. He is a Global Expert with the [World Economic Forum](#) and a regular speaker at international conferences, and appears regularly on Real Vision and other leading media.

The 1946-70 Western Baby Boom saw a major rise in births, creating the largest & wealthiest generation that has ever lived

- ❖ This SuperCycle led to unbroken growth of GDP & chemical demand as the Boomers moved into the Wealth Creator 25 – 54 cohort
- ❖ Outsourcing to emerging economies became essential
- ❖ Since 2001, Boomers are becoming the Perennials 55+ cohort
- ❖ Older people are essentially a replacement economy
 - Perennials spend less and save more
 - Emerging economies re-focus on domestic demand
- ❖ **Business model/technical innovation is essential**



Welcome to the New Normal

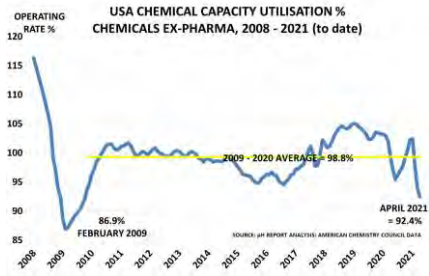
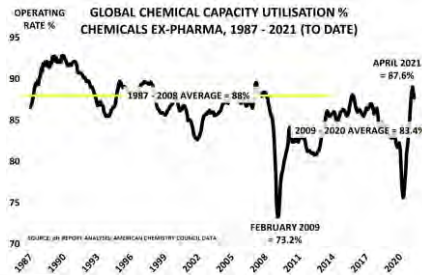
- ❖ What's happening in the global economy and the implications for the US and other countries
- ❖ The need for businesses to take a more holistic view of the environment in which they operate
- ❖ Refocusing in response to changes in consumer demand and moves to a greener economy

Globalisation provided "stuff" for babyboomers:
Sustainability is service-led and provides "solutions"

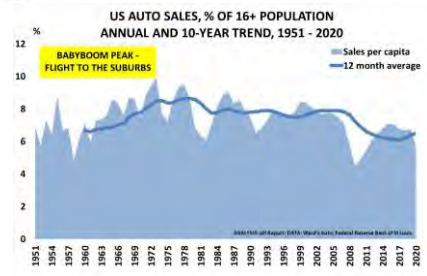


Supply-chain bottlenecks are giving the impression of US demand surge

Global Capacity Utilisation has rebounded to post-2008 highs



The US has seen a double-dip

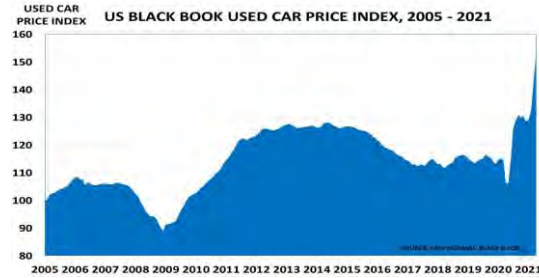
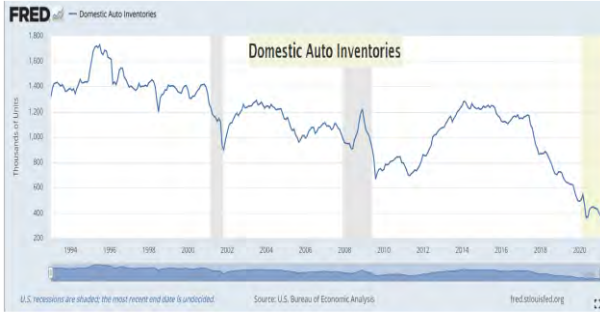


US auto ownership is in slow decline

US hit by ‘double whammy’ of parts/product shortages; CO2 concerns
 New car inventories = 316k; used car prices up 50% over past 12 months; Climate change/CO2

“It’s shocking to me how much I’ve learned about the supply base in Q1.”

Jim Farley, Ford CEO, 5 May 2021



2035
2035
2040

GM aspires to eliminate tailpipe emissions from new light-duty vehicles.

GM commits to 100% renewable energy for electricity to power global facilities.

GM aspires to be carbon neutral in global products and operations.

Welcome to the New Normal

- ❖ What’s happening in the global economy and the implications for the US and other countries
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Globalisation provided “stuff” for babyboomers:
 Sustainability is service-led and provides “solutions”



SOURCE: THE PH REPORT

Protectionism and trade wars are here to stay - Biden has continued Trump's policy without the rhetoric



- ❖ The current trade wars are symptoms of the end of the BabyBoom in the west
- ❖ The easy growth of the past is no longer needed, so people see no value and only threats in globalization
- ❖ America continues to worry about the threat from Chinese technology
- ❖ America views China's manufacturing dominance as a national security threat

Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT

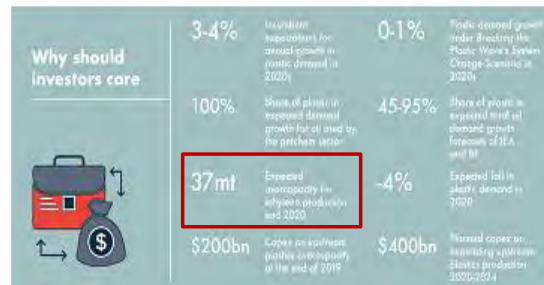
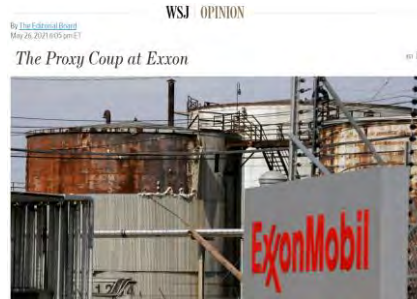


What is the estimated overcapacity for ethylene by the end of 2020?

- 1 megaton (1 million tons)
- 1 kiloton (1 thousand tons)
- 37 megatons (37 million tons)
- 73 kilotons (73 thousands tons)
- 1 gigaton (1 billion tons)



Carbon Tracker warns the petchems industry faces “continued low process and stranded assets”



Welcome to the New Normal

- ❖ What's happening in the global economy and the implications for the US and other countries
- ❖ The need for businesses to take a more holistic view of the environment in which they operate
- ❖ Refocusing in response to changes in consumer demand and moves to a greener economy

Globalisation provided “stuff” for baby boomers: Sustainability is service-led and provides “solutions”



Transition can happen very quickly – Easter Parade, New York

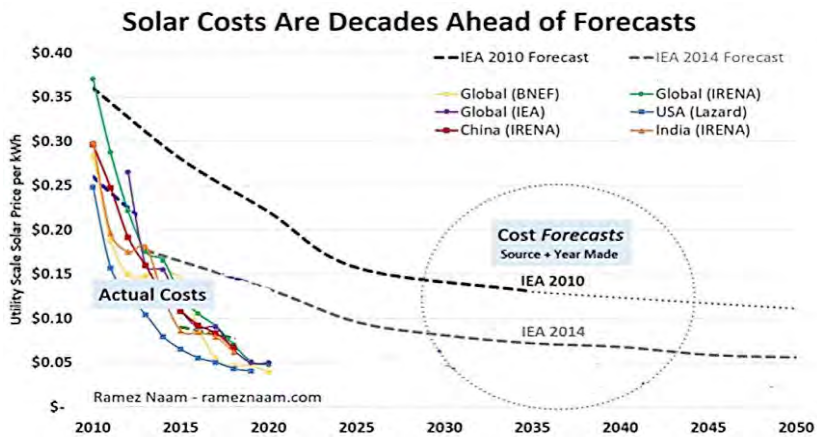
1900 Spot the car?



1913 Spot the horse?



Incumbents are extremely bad at forecasting disruption



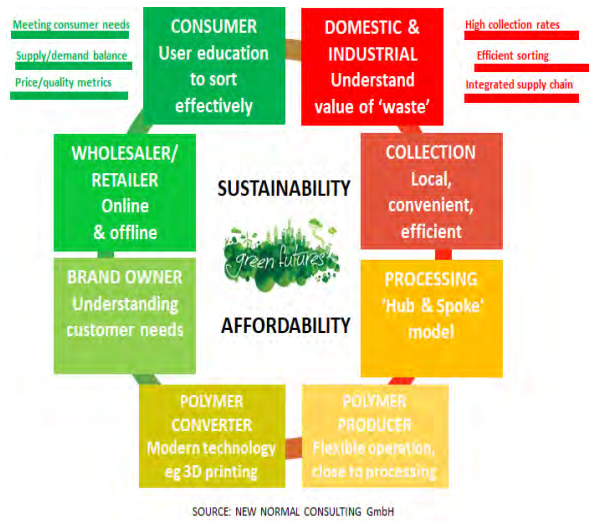
The circular economy – the new Vision for oil & petchems

The plastics industry faces pressure from two directions to move quickly to using recycled plastic as a feedstock:

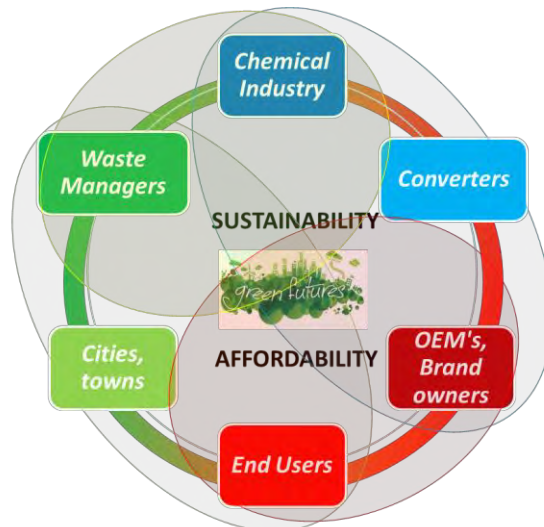
- The growth of Electric Vehicles means refineries will close. Shell plan to have just 6 major refineries by 2025
- A new Nova Institute report for Unilever notes that "Contrary to energy, it is not possible to decarbonise chemicals and products. The renewable carbon family is the only pathway to a sustainable future."

Nova expect recycling to account for 2/3rds of plastics production by 2050, with bio and CO2-based sources providing the rest:

"This paradigm shift creates the opportunity for the "biggest transformation of the chemical sector since the industrial revolution"



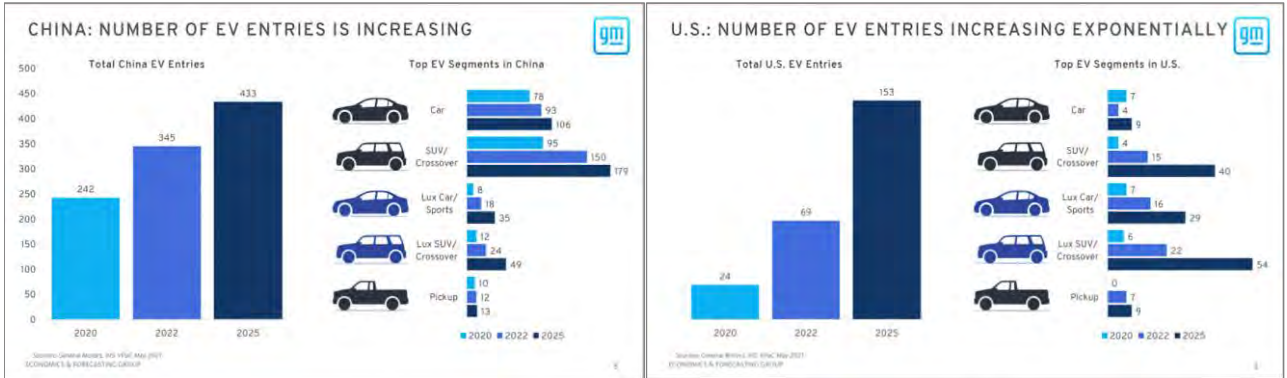
Collaboration needs to intensify amongst the key partners



SOURCE: NEW NORMAL CONSULTING GmbH

China is currently just ahead of EU in terms of EV market share, but USA is set to catch up very quickly in its core market segments

China is clearly leading the pack, but focused on the cheap end

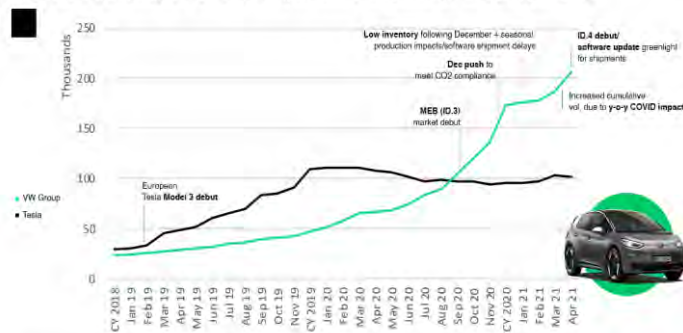


China is currently just ahead of EU in terms of EV market share, but USA is set to catch up very quickly in its core market segments

EU is close behind and pushing out Tesla: Ford's F-150 EV took 45k orders in 48 hours

VW Group BEV volumes double Tesla's in Western Europe

Fig. 01/0524: West European 12-month rolling cumulative new passenger car BEV registrations



Source: Schmidt Automotive Research research | VW Group includes: Volkswagen, Audi, SKODA, Seat, Porsche brands. Western Europe 18 Markets: EU Member States prior to the 2004 enlargement plus EFTA markets Norway, Switzerland, Iceland, plus UK

Schmidt Automotive Research

Audience Survey Question

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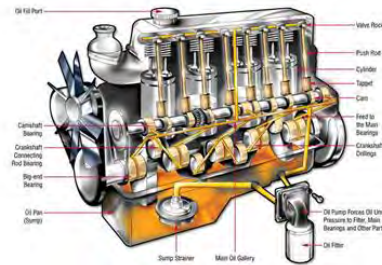
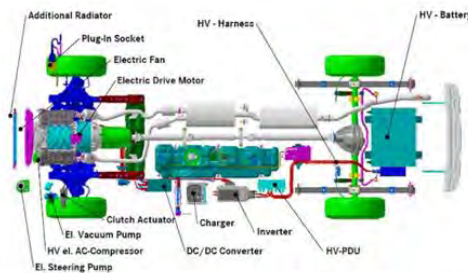
Conventional drivetrains for cars (components that deliver power to the driving wheels) have around 2,000 parts. In comparison, **how many parts do drivetrains for electric cars contain?**

- About 1,500 parts
- About 1,000 parts
- About 100 parts
- About 20 parts
- 1 part



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Electric vehicles change auto manufacturing

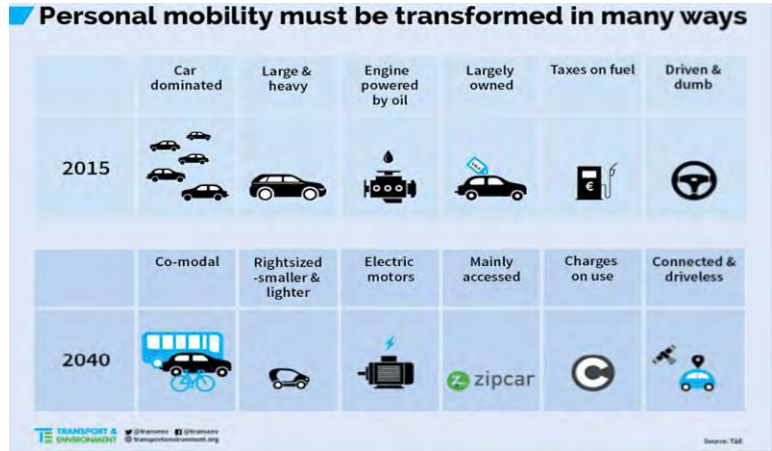


EV power train versus gasoline engine

Electric drivetrains can have fewer than 20 moving parts, whilst conventional drivetrains have as many as 2,000. Fully electric cars don't have multi-speed transmissions, radiators, fuel injectors, gas tanks, valvetrains or exhaust systems. Most individual components used in Internal Combustion Engines will disappear, as will much of the chemical demand currently under the bonnet.

Companies need to develop more service-based business models, where the supplier is focused on providing solutions rather than products. Fleet management services are an obvious opportunity, with more services likely to develop as autonomous vehicles arrive.

**Most aspects of the personal auto market will be transformed by 2040
The new ecosystem will focus on providing software-driven mobility**



The pandemic has acted as a catalyst to accelerate key paradigm shifts

The “15-minute” city puts people at the centre of the planning process instead of cars, with shops, entertainment, education, healthcare (& work) all within 15 minutes by foot or bike.

The C40 Group of major global cities is closely linked to the new Green Deals, as much of the money will be spent locally, by city mayors – and transport is a key area for change.



Paris is pioneering the 15-minute concept



Barcelona is developing car-free Super Blocks

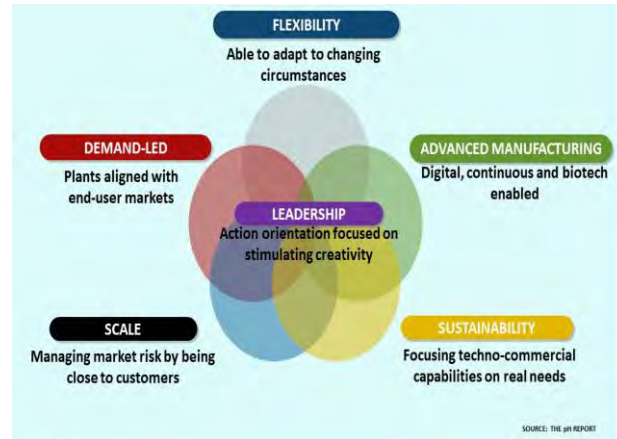
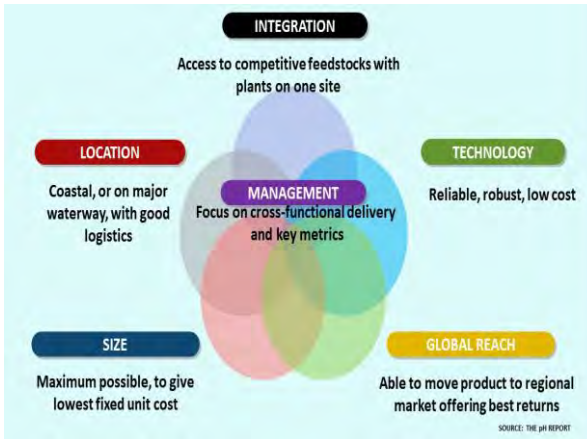


GM-backed Cruise starts delivering 4000 autonomous taxis to Dubai in 2023 – the aim is for 25% of all road trips to be driverless by 2030

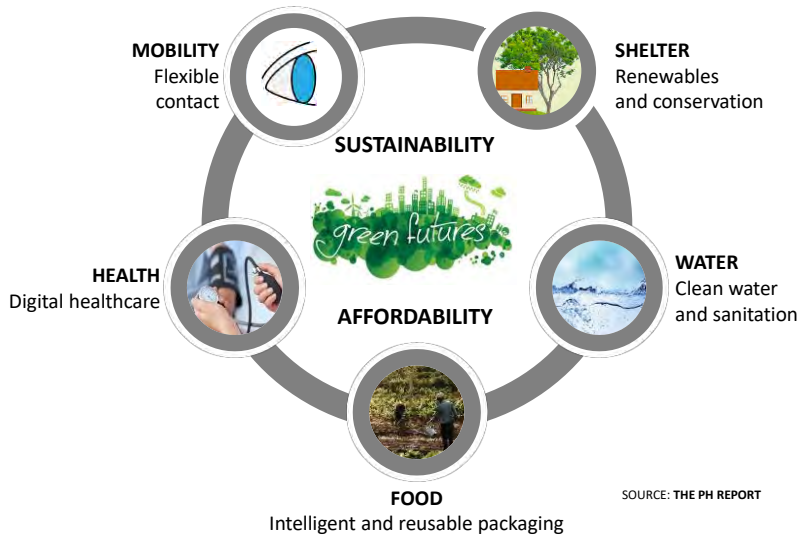
Critical Success Factors are Transforming

The Boomer SuperCycle
Supply-driven, product focused

The New Normal
Demand-led, solution-oriented



Globalisation provided “stuff” for baby boomers: Sustainability is service-led and provides “solutions”



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Chemistry and the Economy

Supply Chain Woes and is Industry "Sprouting" Green?



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Chemistry and the Economy: Supply Chain Woes and is Industry “Sprouting” Green?



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Chairman, New Normal Consulting



BILL CARROLL
Founder, Carroll Applied Science

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Moderator: Paula Christopher, American Chemical Society

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- What a microaggression is, looks like, and how it manifests
- How to respond to microaggressions if you experienced one or how to respond to someone who has shared that they have been offended by something you did or said
- How to respond to a microaggression if you witnessed one, but were not an active participant

Co-produced with: ACS Office of Diversity, Equity, Inclusion & Respect and ACS Diversity, Equity, Inclusion & Respect Advisory Board

Bioinspired Nanomaterials
From Discovery to Market Pipeline

Date: Thursday, June 10, 2021 @ 2-3pm ET

Speakers: Siddharth Patwardhan, The University of Sheffield (UK)

Moderator: David Constable, American Chemical Society

Register for Free!

What You Will Learn:

- Why the understanding bio-nano interface is a powerful basis for designing bioinspired syntheses of functional nanomaterials
- How careful design of bioinspired nanomaterials can provide commercially relevant products
- Why process chemistry, scale-up and downstream processing are equally important in reaching the markets

Co-produced with: ACS Green Chemistry Institute

Lithium-ion Batteries
The Road to Sustainable Energy Storage

ACS President H.N. Cheng Presents: FRONTIER FRIDAYS

Date: Friday, June 11, 2021 @ 1-2pm ET

Speakers: Amy Prieto, Colorado State University and Prieto Battery, Inc. and H.N. Cheng, ACS President

Moderator: Young-Shin Jun, Washington University in St. Louis

Register for Free!

What You Will Learn:

- Why battery chemistry is complex and interdisciplinary
- How the iteration of synthesis, characterization, and modeling is key for accelerating discovery
- Why there is no one perfect battery for every application

Co-produced with: ACS Committee on Science

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