Dear Industry Colleagues,

This is the 1st issue of our newsletter on the trends that we observe in the vast & rapidly growing Global Next generation Chemicals & Advanced Materials Trends. We at F1rst, track the food ingredient and next generation markets on a continuous basis, and we will continue to share our observations of this exciting market once a month for you.

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**Neste-Covestro Collaboration Promotes Renewable Raw Materials For Plastics Production**

Neste and Covestro start a strategic cooperation in Europe to promote the use of sustainable raw materials in plastics production. Neste will supply Covestro with material from renewable sources to replace a significant portion of the fossil raw materials used to date in the manufacture of polycarbonates – a high-performance plastic used in car headlamps, LED lights, electronic and medical devices and automotive glazing.

Over the short term, the collaboration aims to replace.... [Read more](#)

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**Global Base Oils and Lubricant Market 2020-2025**

The global base oil production capacity surged in 2019 following the start-up of many new plants, yet the supply for the base oil and lubricant market was reduced due to a combination of many factors one of which is the diversion of supplies into the diesel and marine fuel markets. At present due to the global COVID-19 scenario, the oil markets are upended by demand concerns due to the cascade of reasons, the major one is the decline in crude oil prices. The coronavirus spread continues to dampen the outlook for demand and economic growth.

Given the current scenario, it is vital for the key stakeholders in the base oils and lubricants market to understand the present challenges and possible technology solutions from the real-world perspective by F1rst.... [Read more](#)
Aging Wind Turbines Pose Recycling Challenges

Wind energy currently supplies 15% of electricity used in the European Union (EU). This is set to rise to 50% by 2050 under the European Commission’s long-term decarbonization strategy. “The blades pose technical, economic and regulatory hurdles.”

However, the bloc is facing a serious, more short-term issue: how to... Read more

Energy Saver: Keep Your Plant At A Steady State

Achieving low energy intensity requires pairing low energy consumption with high production rates: Energy Intensity = Energy Consumption/Production “Stable operation often also yields other benefits.” We discussed this concept in last month’s column (see, “Low Rate, Low Efficiency”), and applied it specifically to the impact of production rate cuts on energy intensity.

This month, we turn to another ramification of this simple equation: The beauty of the steady state. In general, if you keep... Read more

Indian Oil Corp says Unlock 1.0 to revive fuel sales soon

New Delhi: Weeks after the coronavirus lockdown led to fuel sales nosediving to record lows, Indian Oil Corp (IOCNSE -0.06 %), the nation's largest oil firm, sees demand returning with the resumption of economic activities. The company said though it is on track to spend the approved capital expenditure for 2020-21, it has "critically examined all capex proposals for rationalisation of cost and time frame."

"The company is also conscious of the....Read more

Petronas eyes stake in Tata Power's Inv IT

Mumbai: Malaysian state oil and gas company Petrolim Nasional Bhd (Petronas) is in active negotiations with the Tata Group to become a key investor in Tata Power NSE 1.21 %'s planned renewable energy infrastructure investment trust (Inv IT) as India’s leading utility looks to unlock value and pare debt, said people aware of the matter.

Tata Power Renewable Energy Ltd (TPREL) is a wholly owned subsidiary of Tata Power Co. Ltd (Tata Power), India’s largest integrated utility company. Tata....Read more
Net marketing margin on petrol and diesel turns negative

NEW DELHI: Net marketing margin on petrol and diesel has turned negative after soaring to a record in early May as oil marketing companies have frozen domestic fuel rates while international rates and taxes have sharply increased. Net marketing margin is currently at minus Rs 1.56 per litre down from Rs 16.1 per litre during May 1 to 5, according to ICICI Securities.

The margin sharply contracted after the government... Read more

HPQ Silicon Enters Into Confidential Technical Discussions With an Advanced Material Developer Regarding Energy Storage Applications

HPQ Silicon Resources Inc. ("HPQ" or the "Company") TSX-V: HPQ; FWB: UGE; Other OTC : URAGF; is pleased to announce that HPQ has signed a non-disclosure agreement ("NDA") with an advanced materials developer for the purposes of exchanging technical information and sending silicon samples produced by the PUREVAP™ Nano Silicon Reactor (NSiR) for energy storage applications testing. For industry competitive reasons, and according to the terms of the NDA, the identity of the advanced materials developer must remain confidential.

“This NDA is further indications that the game changing potential of the PUREVAP™ NSiR process we are developing with PyroGenesis Canada Inc. (TSX-V: PYR) is attracting... Read more

A closer look at graphene electrodes

Scientists in the United States have found several shortcomings in the approaches commonly used by scientists to model the structure of electrodes. The group outlines a new approach which it says could lead to the discovery of new materials and combinations that can lead to batteries performing better for longer. Made up of a few very small, opaque components packed closely together, looking at all of the processes going on inside a battery is not an easy task for scientists, and difficulties in clearly observing and modeling some of these processes is still a major hurdle for research institutes.

Scientists at the University of Houston (UH) in the United States, working... Read more
New Material, Modeling Methods Promise Advances in Energy Storage

The explosion of mobile electronic devices, electric vehicles, drones and other technologies have driven demand for new lightweight materials that can provide the power to operate them. Researchers from the University of Houston and Texas A&M University have reported a structural supercapacitor electrode made from reduced graphene oxide and aramid nanofiber that is stronger and more versatile than conventional carbon-based electrodes.

The UH research team also demonstrated that modeling based on the material nanoarchitecture can provide a more accurate understanding of ion diffusion and related. 

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Industry demands clear policy on energy storage in new electricity law

Mumbai: A clear policy framework regarding energy storage is needed in the new electricity law for the adoption of storage technologies in suitable areas, an industry body has suggested. The Draft Electricity (Amendment) Bill, 2020, floated by the power ministry, seeks amendments to the Electricity Act, 2003, to address a series of challenges faced by the sector and provide measures to improve regulatory discipline, private sector participation and give a thrust on renewable energy sector, among others.

"While we welcome the proposed amendments, we are seeking a clear policy framework regarding energy storage in the act. India has emerged as one of the fastest-growing...

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End-Of-Life Electric Vehicle Batteries: Recycling or Second-Life?

With the rapid adoption of electric vehicles (EVs), the demand for Li-ion batteries will grow significantly in the coming decades. In the meanwhile, as EV batteries begin to reach their end-of-life, we will see an exponential growth of retired Li-ion batteries coming out of vehicles. By 2020 we will already have around 14 GWh, or 102,000 tonnes of Li-ion batteries retiring from EVs per year. With the rapid adoption of EVs, the total amount of EV batteries reaching end-of-life is expected to reach 7.8 million tonnes per year by 2040, according to the latest IDTechEx report, "Li-ion Battery Recycling 2020-2040".

When an EV battery is reaching its end-of-life of its vehicle service, the battery can either be repurposed for a second-life in alternative...
This Colombian Scientist Is Searching For A Battery That Won’t Explode

Lithium batteries power our phones and modern lifestyle, but they have also been known to catch on fire. Colombian scientist Laura Loaiza is working on ways to increase the safety of batteries by finding ways to move away from volatile and flammable components. Loaiza, a postdoc researcher at Chalmers University of Technology in Gothenburg says despite all the research into battery technology, there is still a great deal to discover — and there is huge interest from industry.

"Lithium is not an abundant material.

Tesla battery offshoot backed by St Baker fund flags major cost breakthrough

A battery testing and research company backed by Australia’s St Baker Innovation Fund, and with links to Tesla’s exclusive battery research lead Jeff Dahn, has patented a new single crystal cathode process that could dramatically reduce the cost of making lithium-ion batteries. Novonix sprung out of Tesla battery researcher Jeff Dahn’s lab at the Dalhousie University, and as reported by The Driven on Friday sponsors the work of Mark Obrovac at Dalhousie.

Founded by Novonix Co-Founder and Ex-Tesla senior battery

Spontaneous formation of nanoscale hollow structures could boost battery storage

An unexpected property of nanometer-scale antimony crystals—the spontaneous formation of hollow structures—could help give the next generation of lithium ion batteries higher energy density without reducing battery lifetime. The reversibly hollowing structures could allow lithium ion batteries to hold more energy and therefore provide more power between charges. Flow of lithium ions into and out of alloy battery anodes has long been a limiting factor in how much energy batteries could hold using conventional materials.

Too much ion flow causes anode materials to swell and then shrink during charge-discharge cycles, causing mechanical...
Second Life or Recycling – What’s the Answer for End-of-Life Electric Vehicle Recycling

With the rapid adoption of EVs, the total amount of EV batteries reaching end-of-life is expected to reach 7.8 million tonnes per year by 2040, according to the latest IDTechEx report, “Li-ion Battery Recycling 2020-2040”. According to the research, when an EV battery is reaching end-of-life in vehicle service, the battery can either be repurposed for a second-life in alternative applications or recycled to obtain the raw materials.

Unlike batteries used in consumer electronics such as our laptops and mobile phones, the batteries retired from electric cars could still........... Read more

Viable sodium-ion battery for sustainable energy storage

Washington State University (WSU) and Pacific Northwest National Laboratory (PNNL) researchers have created a sodium-ion battery that holds as much energy and works as well as some commercial lithium-ion battery chemistries, making for a potentially viable battery technology out of abundant and cheap materials. The team reports one of the best results to date for a sodium-ion battery. It is able to deliver a capacity similar to some lithium-ion batteries and to recharge successfully, keeping more than 80 percent of its charge after 1,000 cycles.

The research, led by Yuehe Lin, professor in WSU's School of Mechanical and Materials Engineering, and Xiaolin Li, a senior research........... Read more

Scientists develop low-cost, high power density vanadium flow battery stack

The development of renewable energies such as wind energy and solar energy is limited by their inherently random and intermittent nature. However, the vanadium flow battery (VFB) offers a cost- and energy-efficient, long-life energy storage technology that can store and smoothly output power from renewable energies. The VFB energy storage system mainly comprises the stack, the electrolyte, and systems for pipeline, battery management and energy conversion.

Among these components, the stack plays a crucial role. Therefore, increasing the stack’s power density and reducing its cost will further........... Read more

Thank you once again for your support and encouragement to our team and your feed-back has been received warmly by our team. We at F1rst continue to track food ingredient and new generation chemicals market trends and provide ingredient and producers with top-class market research. Global chemicals markets covered by us recently include those of Base oils and Lubricants, Recycled plastic, Lithium ion Battery, Pipeline Materials, Carbon Fibres, Coatings, Energy storage materials, Graphene, Packaging Materials and many others. In short, we at F1rst are striving hard to help you understand the chemical market trends through detailed strategic and operational market reviews and help you with innovative ideas on various ingredient applications through our Table-top Exhibitions.
We will keep in touch with you with useful and exciting information about the Advance chemicals markets as above. Please contact us at denver@firstmr.com or aravind@firstmr.com and we will be happy to speak to you about how we can help you with your ingredient market and application strategy.