

Next Generation Cleantech

Doing Even More, With Even Less...

...Costs

...Resources

...Damage to our Air, Water, and Land

January 2018

The Original and Trademarked Cleantech Idea/Theme is Still Relevant

Clean is more than green. Clean technology, or “cleantech”, should not be confused with the terms environmental technologies or “green tech” popularized in the 1970s and 80s. Cleantech is new technology **and related business models** offering **competitive returns for investors and customers** while providing solutions to global challenges. Where greentech, or envirotech, represents the highly regulatory driven, “end-of-pipe” technology of the past with limited opportunity for attractive returns, cleantech is driven by **market economics** therefore offering greater financial upside and sustainability.

The concept of cleantech embraces a **diverse range of products, services, and processes** across industry verticals that are inherently designed to,

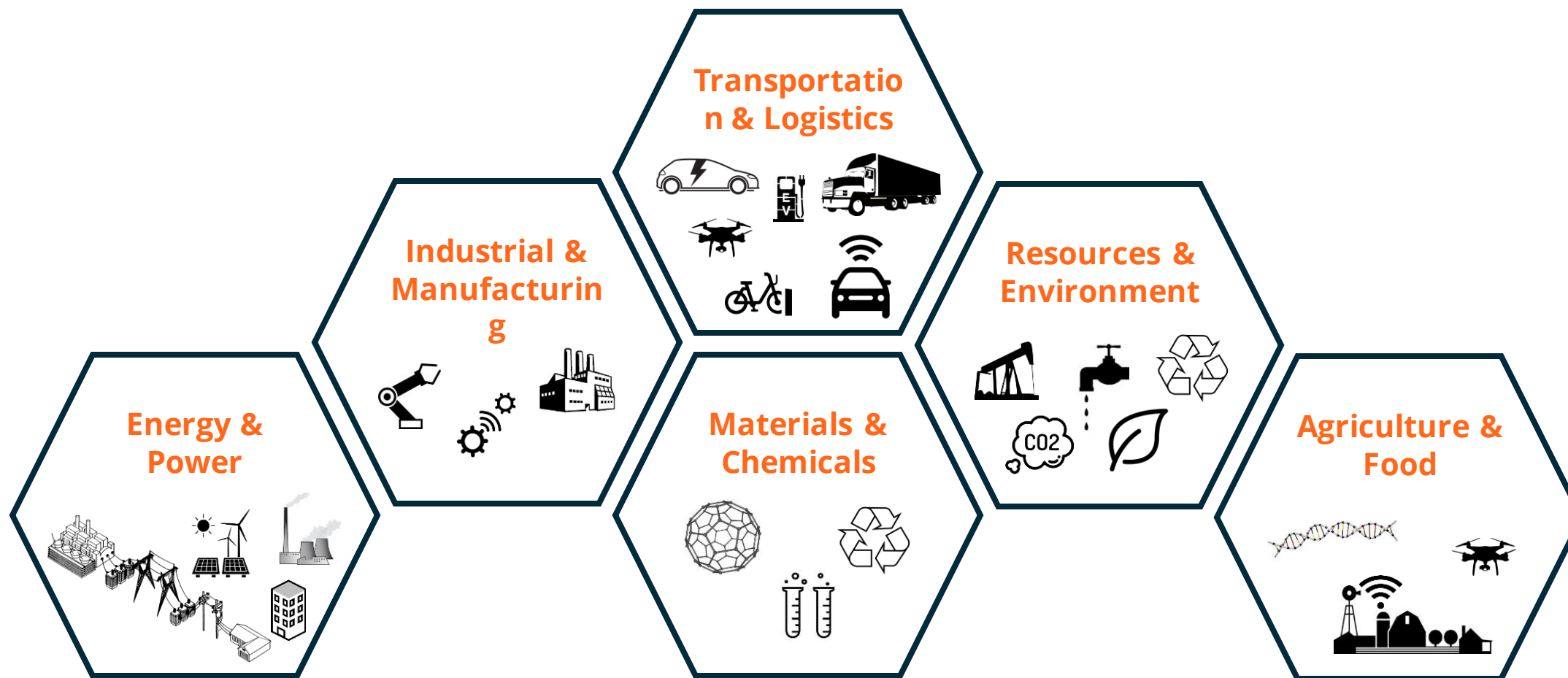
- Provide superior **performance** at **lower costs**
- Greatly reduce or eliminate negative **ecological** impact
- Improve the **productive** and responsible use of natural resources

Cleantech **spans many industry verticals** and is defined by the following eleven segments

- Energy Generation
- Energy Storage
- Energy Infrastructure
- Energy Efficiency
- Transportation
- Water & Wastewater
- Air & Environment
- Materials
- Manufacturing/Industrial
- Agriculture
- Recycling & Waste

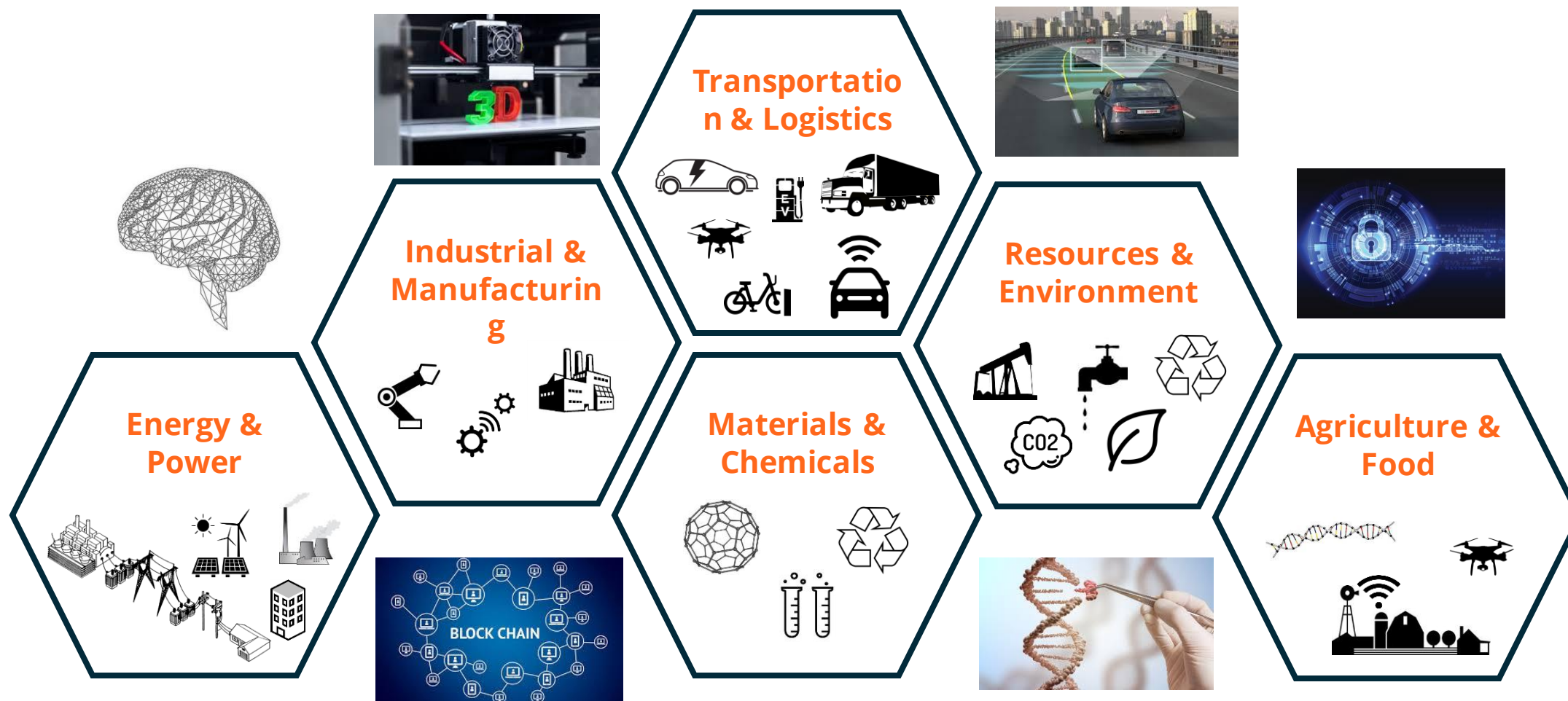
Living on Borrowed Time: Old Industries are on Notice

Hard to find an incumbent company or established industry which is not exercised by what an enduring (sustainable) future looks like. Trillions of \$'s of market value are at stake. That is why we are all here, no?



A Perfect Storm of Systemic Innovation?

How to deal with the potent mix of opportunity, threat and disruption, from a series of convergent drivers and accelerators? “Cleaner” is an important one, but does not sit “stand-alone”.



Transport: ready for such a Perfect Storm in the 2020's?

Could such change and disruption in the Transport sector “drag along” and accelerate change in other segments – like Energy and Power?



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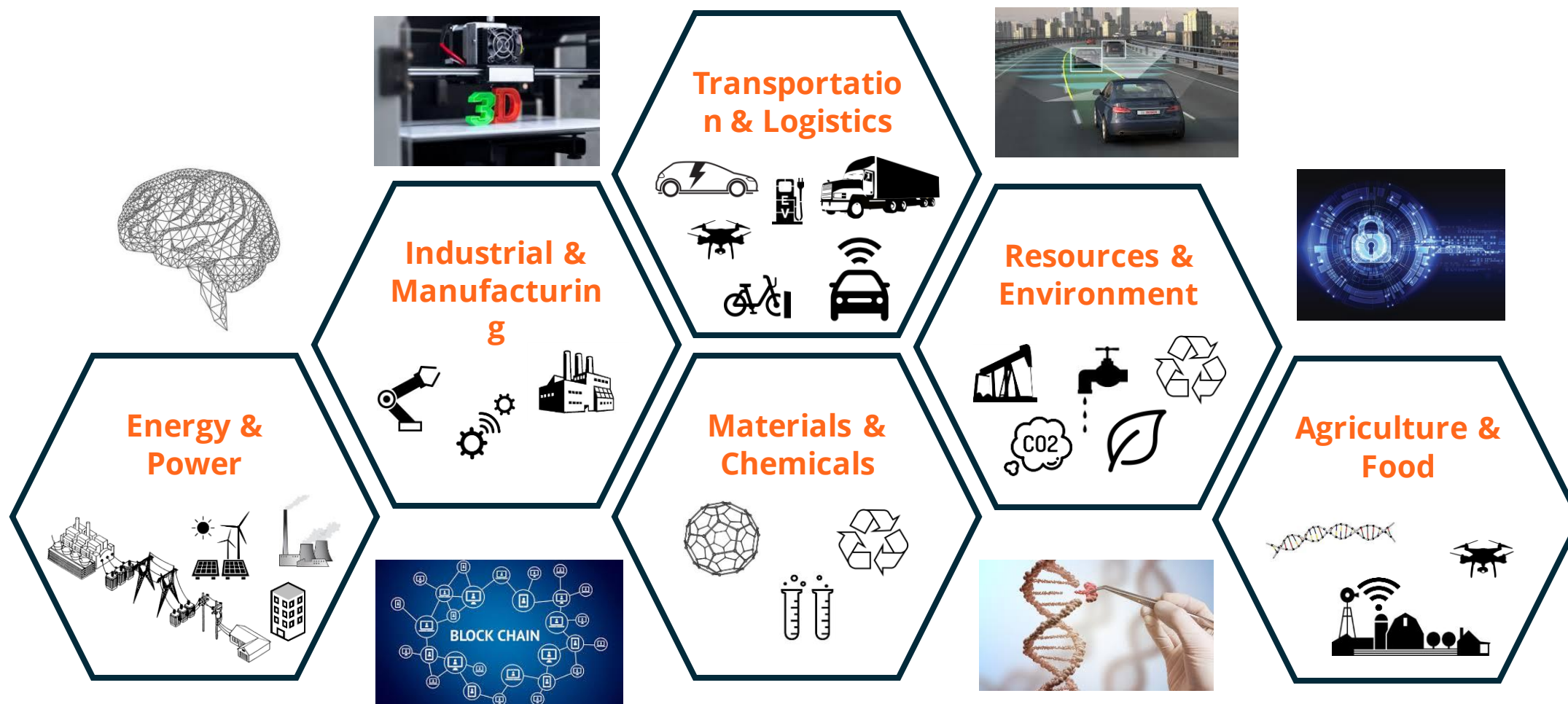
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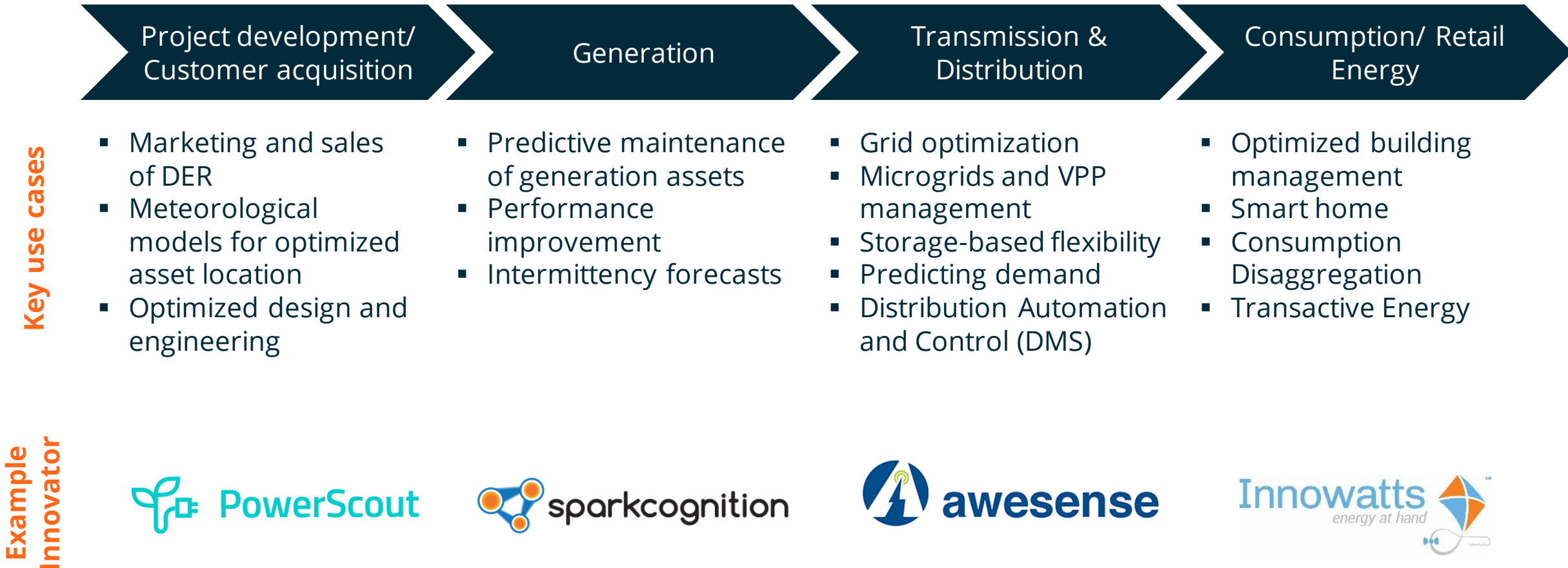


A Perfect Storm of Systemic Innovation?

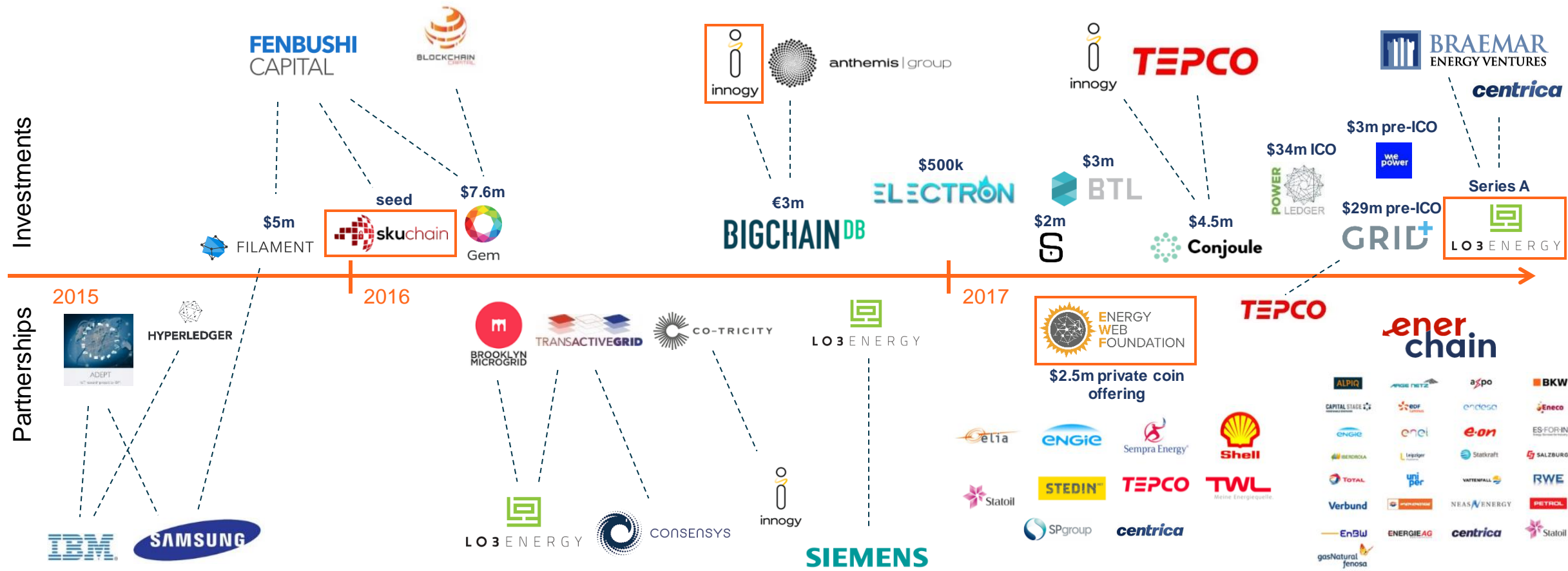
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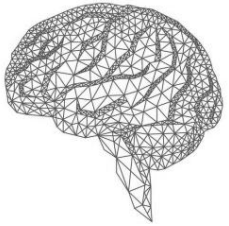
AI impacts across the entire energy and power value chain



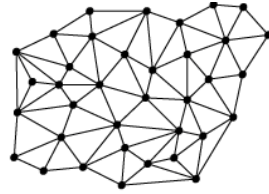
Our Blockchain in Energy And Industry Time-Line: Warming Up For the 2020's



Space: the next Frontier and Platform for Next Generation Industries?



AI



Decentralization



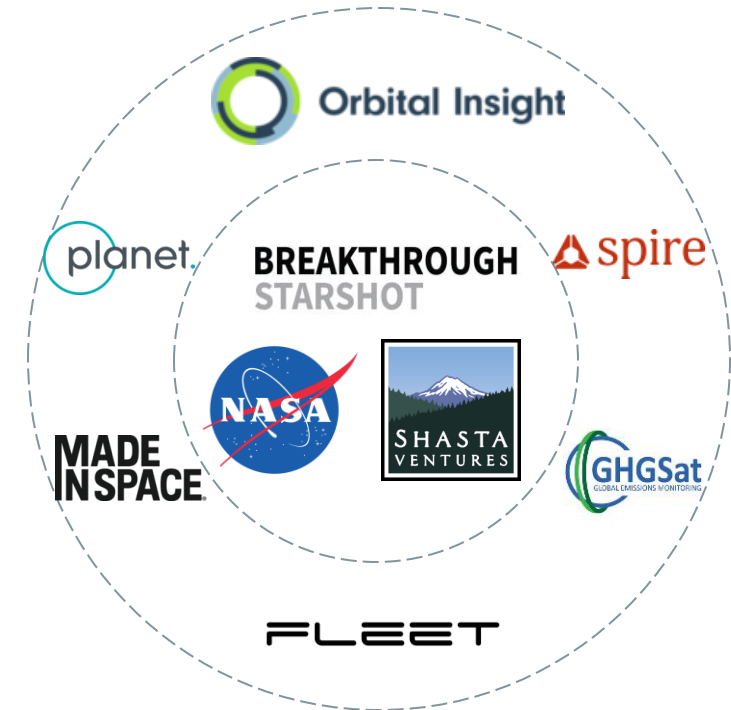
Advanced
Manufacturing



Reusability

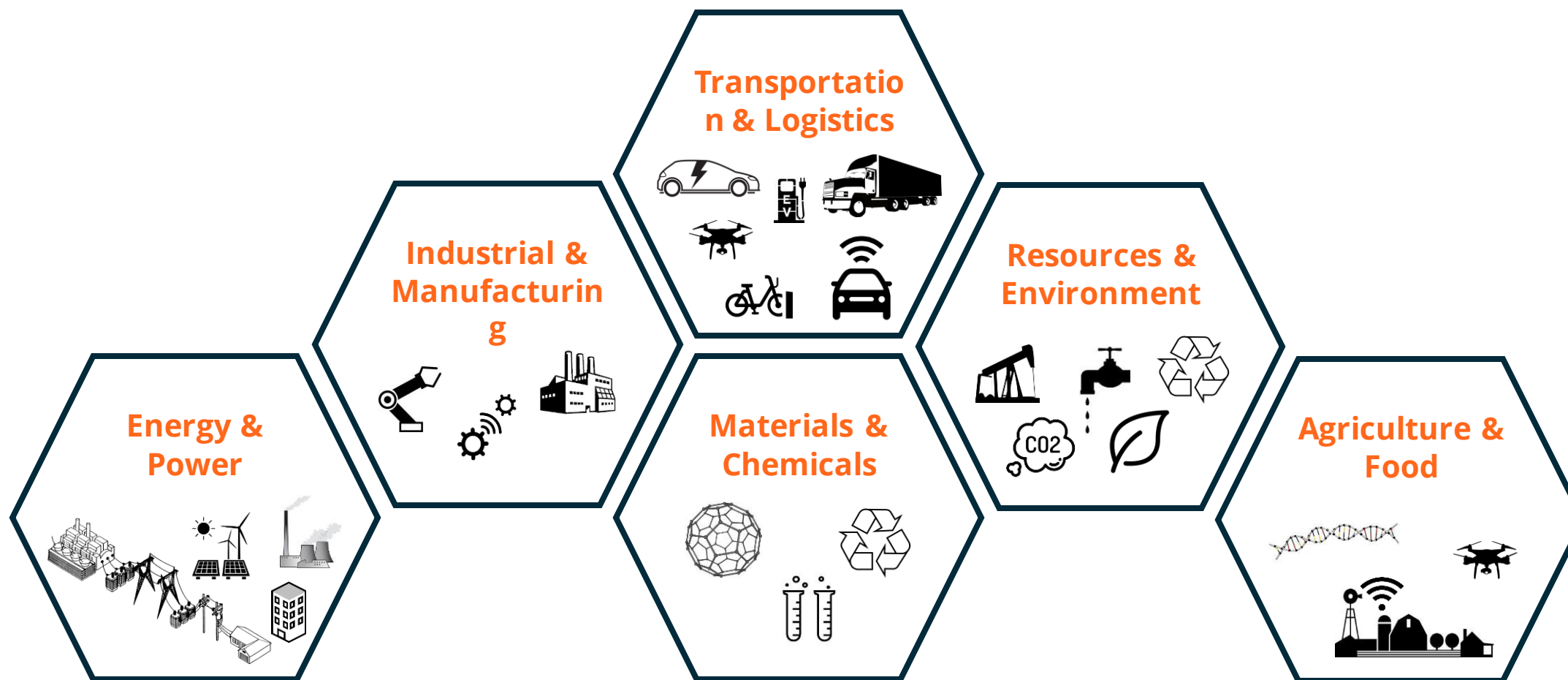
Innovation in many of the 'next-gen' areas we examine is driven by a convergence of several underlying key drivers/enablers.

- Satellite Networks: Smarter, Cheaper, Reusable?
- Geospatial Analytics: Seeing is believing
- The Next-Generation: Some manufacturing shifts to space



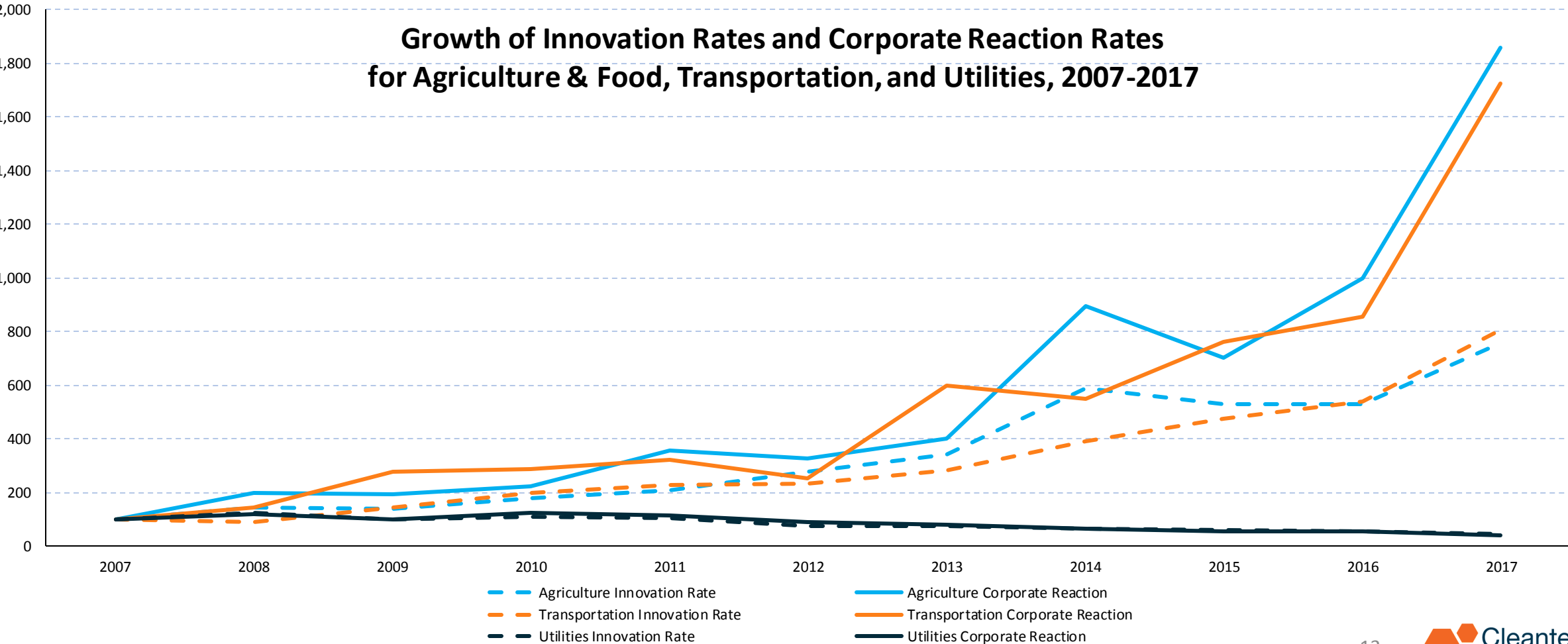
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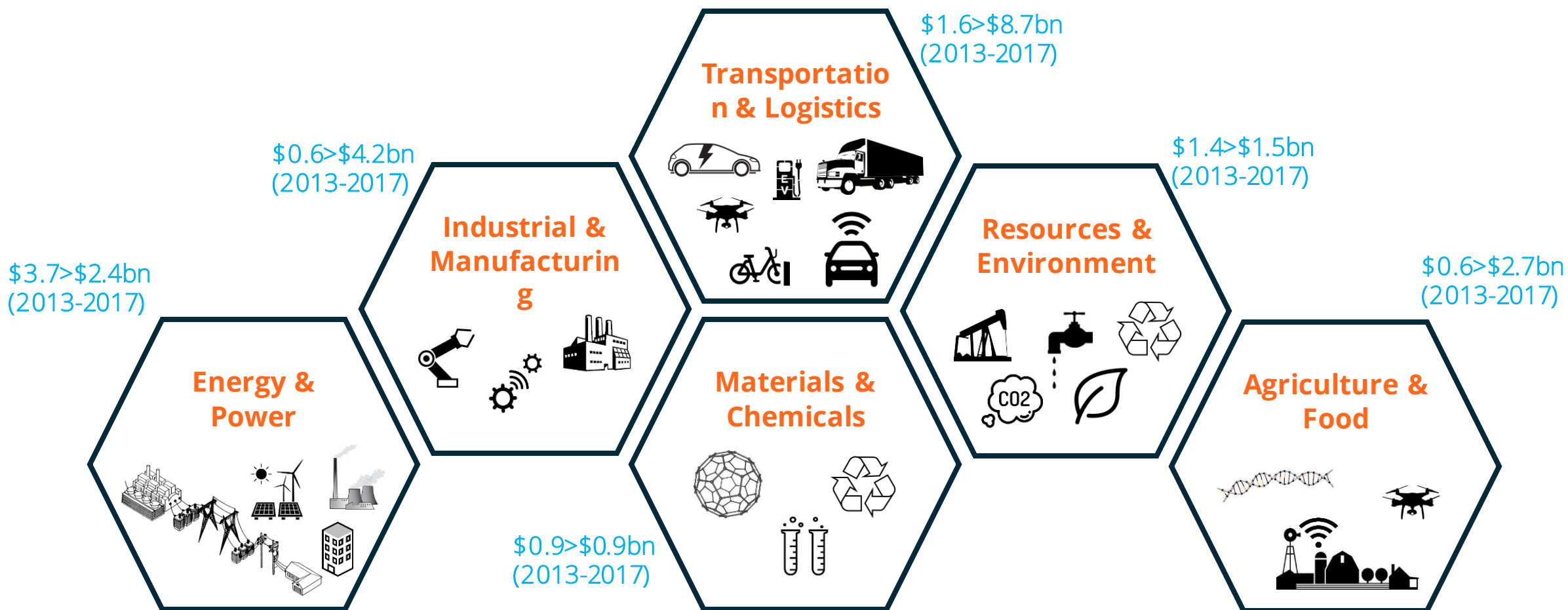
Disruption Intensity: who's feeling it most right now? where's the momentum?

Utilities exhibit a long, steady burn, but the real intensity in growth rates of open innovation are today found around Transportation & Logistics, and Ag and Food.



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Source: Cleantech Group's Quarterly Investment Monitor, Q4 2017



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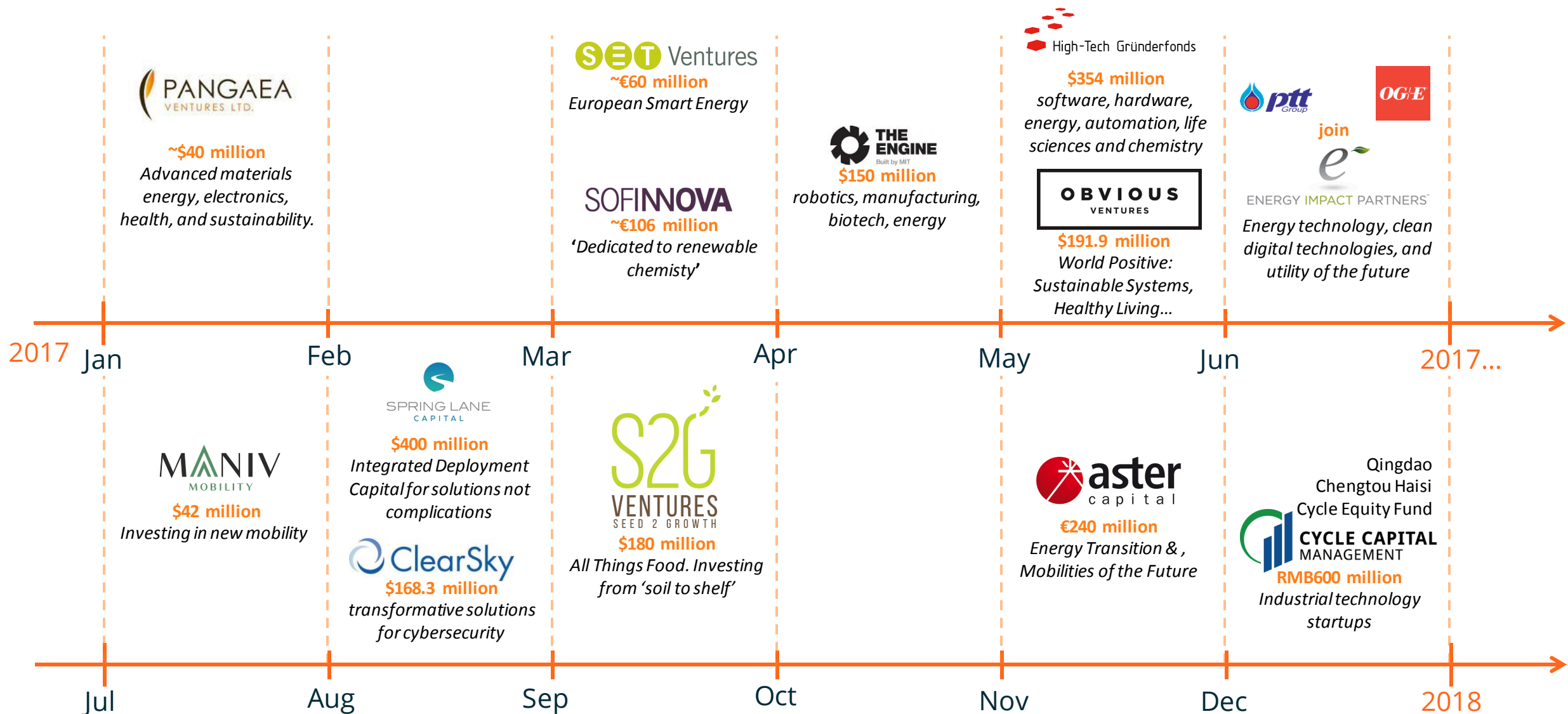
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Dry Powder is Returning: a stronger year for cleantech-related fundraising



The arrival of the billion dollar club is significant for next generation cleantech

Investor	Size	Investment Orientation/Language	Illustrative Portfolio Companies
 SoftBank	\$93 Billion	"Enabling the new age of innovation"	      
 TPG Rise Fund	\$2 Billion	"achieving social and environmental impact alongside competitive financial returns"	  
 OGC OIL AND GAS CLIMATE INITIATIVE	\$1 Billion	"technologies that have the potential to significantly reduce greenhouse gas emissions"	 
 RENAULT NISSAN MITSUBISHI Alliance Ventures	\$1 Billion	"Building clean, affordable and safe cars for everyone"	
 Breakthrough Energy	\$1 Billion	"Ensure...standard of living, including basic electricity, healthy food, comfortable buildings, and convenient transportation, without contributing to climate change."	First Announced Investments Expected in H1-2018
 next 47	€1 Billion	"innovation that can disrupt industries and create new markets"	
 TEMASEK HOLDINGS	Access to many billions of AUM	"Committed to transforming economies, growing middle class income populations, deepening comparative advantages, and invest in emerging champions"	
EMERSON ELEMENTAL	Undisclosed	"promoting equitable diffusion of technology and sustainable modernization"	       



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Next Generations: Significant Change is Afoot

FINANCIAL TIMES

\$4tn wealth transfer sparks battle for kids of the rich

Younger generations are more focused on sustainability, clean energy and impact investing



Alice Ross and Hugo Greenhalgh

NOVEMBER 18, 2017

“With an estimated \$4tn expected to be passed down within a generation in the UK and North America alone, according to a wealth transfer report earlier this year by Royal Bank of Canada, private banks are in a **race to retain the millennial children of wealthy families** and improve their offerings to entice those in their 20s and 30s to sign up.”

“What is very clear to me is that **millennials’ values** are distinctively focused on **making the world a better place, using financial capital for social return, having an impact and supporting sustainable development**,” says Burkhard Varnholt, deputy global chief investment officer at Credit Suisse.

Next Generations: Significant Change is Afoot

Harvard
Business
Review

SUSTAINABILITY

Does Wall Street Finally Care About Sustainability?

by Andrew Winston

JANUARY 19, 2018



“Society is demanding that companies, both public and private, serve a social purpose. **To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society**”

Excerpt from the annual letter to S&P500 CEO's from Larry Fink, CEO of the world's largest asset manager (\$6.3 trillion), BlackRock



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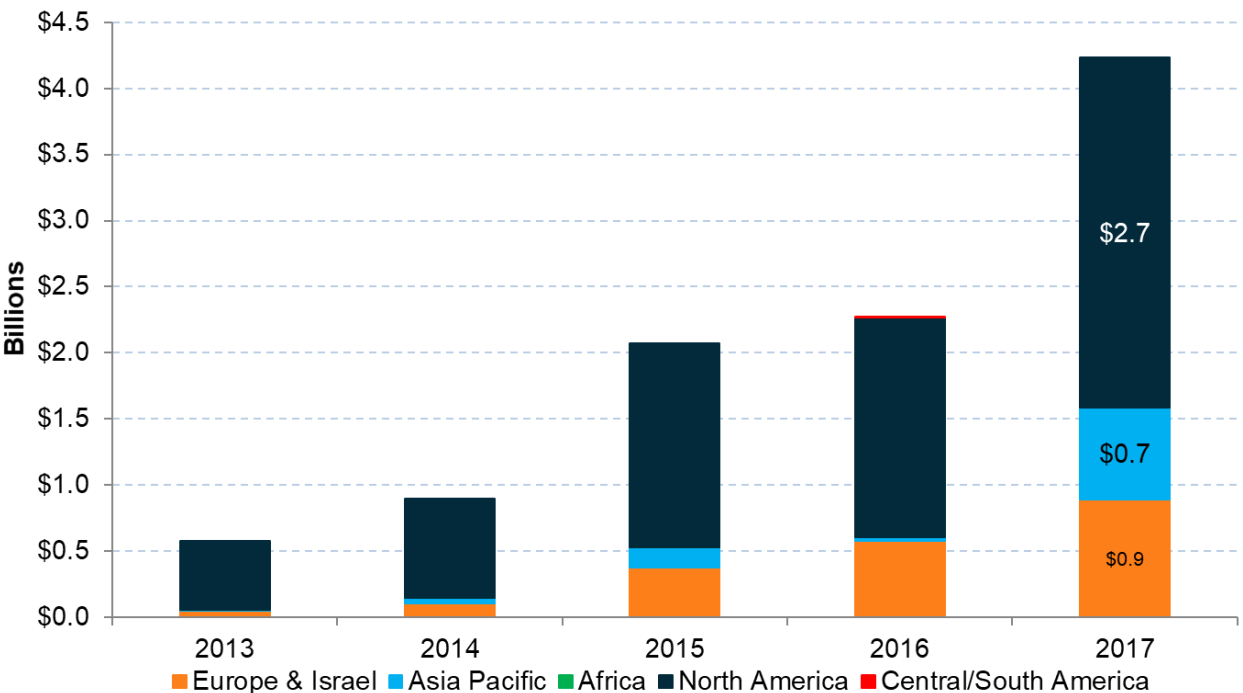
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Next Generation Cleantech: A Truly Global Affair

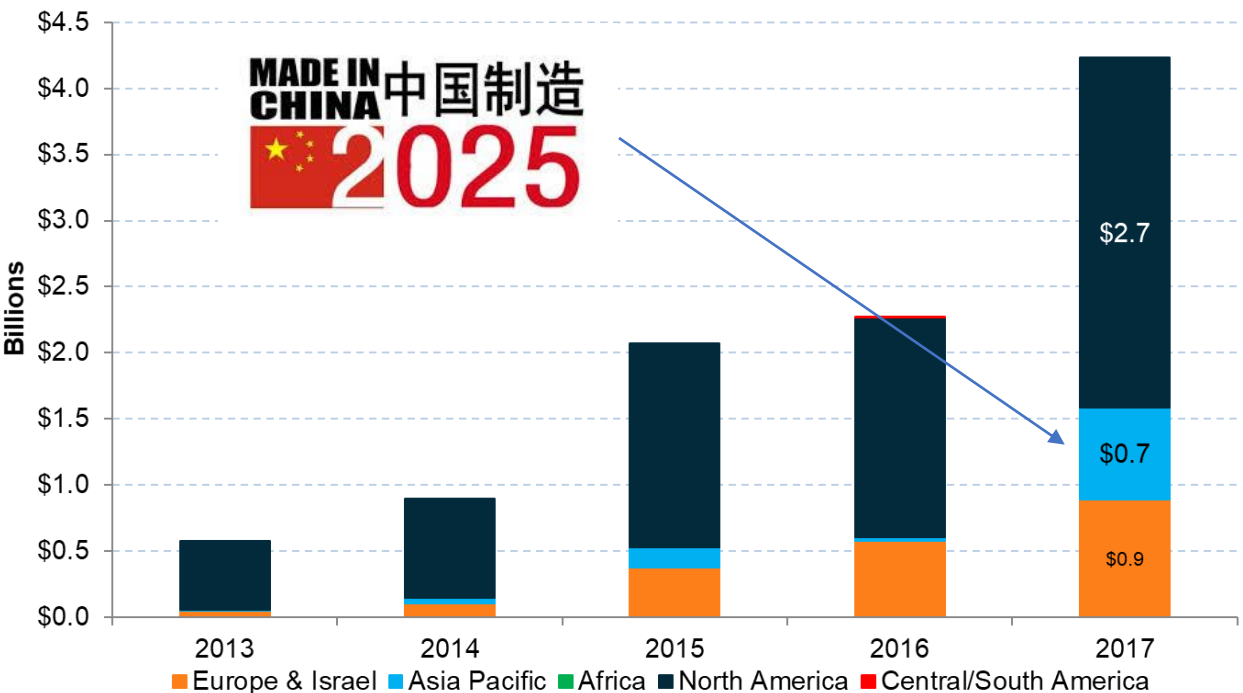
Global distribution of investment dollars of 2017 Industrial & Manufacturing venture deals*



*Excludes outlier deals above \$350M

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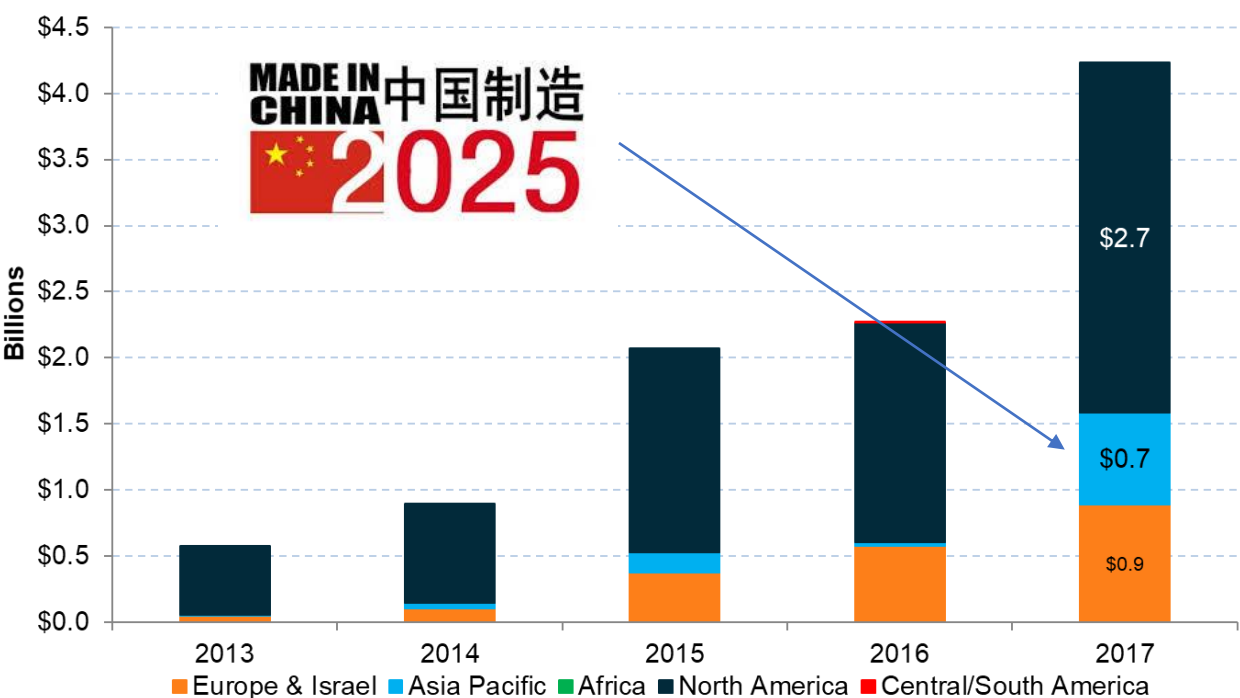
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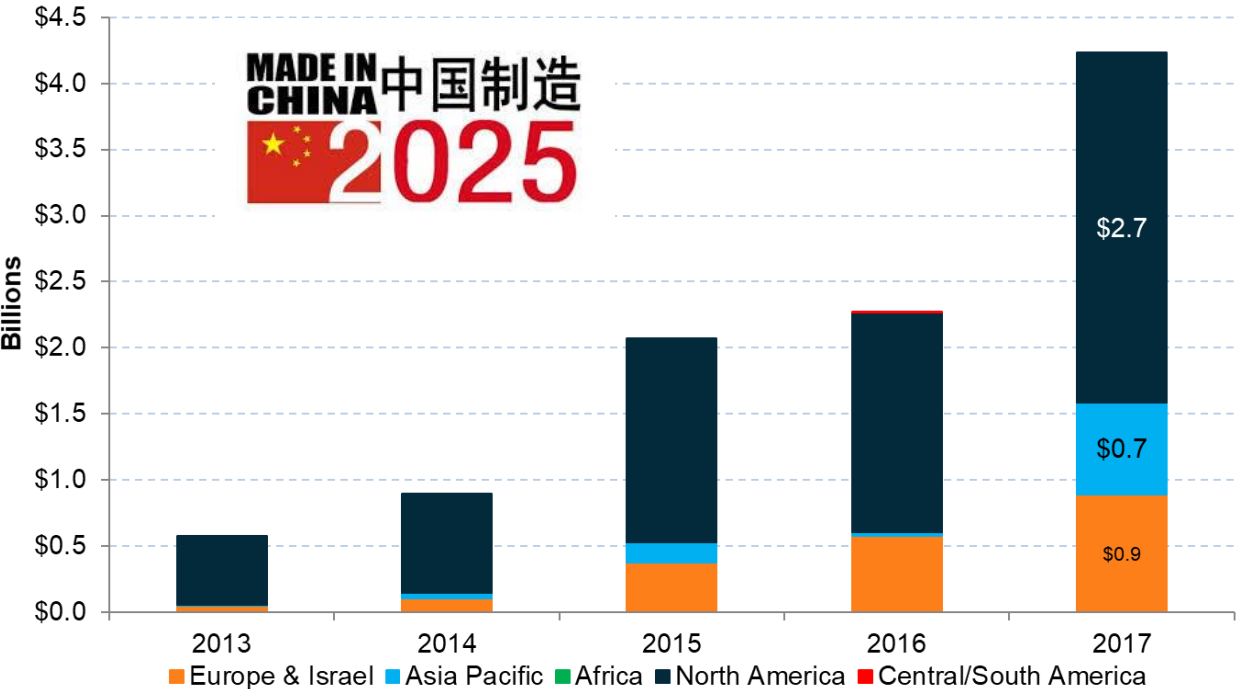


Notable 2017 Asian Transportation/Mobility Investments

Investor	T&M Investments	Notable T&M Investments
Tencent Technology	10	WM Motor, NIO, Ola, Lilium, Mobike, Go-Jek
Baidu	7	WM Motor, SmarterEye, Shouqi, NIO
Didi Chuxing	6	Careem, Taxifi, Grab, Ofo, 99
Hillhouse Capital	6	Momenta, Mobike, NIO
Shunwei Capital Partners	5	AI-Drive, Momenta
ZhenFund	4	TOGO, Fouyoukache

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Charting the future, Connecting the globe.

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