

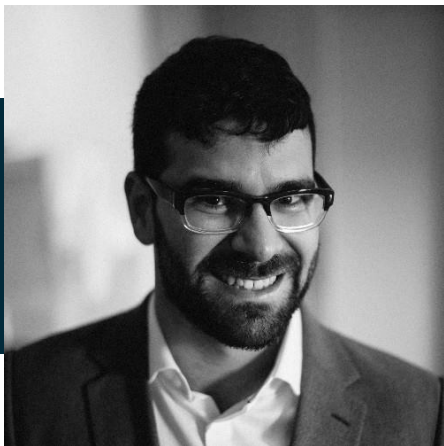


Cleantech Forum **Europe**

Antwerp | May 14-16, 2018



Next-Gen Industries and Future Industrial Hubs



STEPHEN MARCUS

Director of Business Development, Cleantech Group



Cleantech Forum **Europe** | Antwerp

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CEO's of Innovative
Cleantech Companies



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2018 Cleantech Survey

CEO's Please Take the 10 minute Survey

In person with Yoachim OR
@ the Recharge Area with the QR code

Do you want to know what your peers are thinking when it comes to risks associated with:

- International expansion
- Supply chain
- Cyber security



Cleantech Forum **Europe** | Antwerp

Next-Gen Industries and Future Industrial Hubs: Decentralized, Decarbonized and Digitalized



Next-Gen Industries and Future Industrial Hubs



RICHARD YOUNGMAN
CEO, Cleantech Group

Next Generation Cleantech

De-Centralized, De-Carbonized, and Digitized...

...Next-Gen Industries

...Next-Gen Themes

....Next-Gen Ecosystem

...Next-Gen Finance

2008-2018: Not Everything Has Changed!



2008-2018: Not Everything Has Changed!

////////////////////////////////////
The Original 2002, and Trademarked, Description of the Cleantech Idea/Theme Remains Intact, and 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

2008-2018: Big Changes

2008-2018: Big Changes

Say no more....



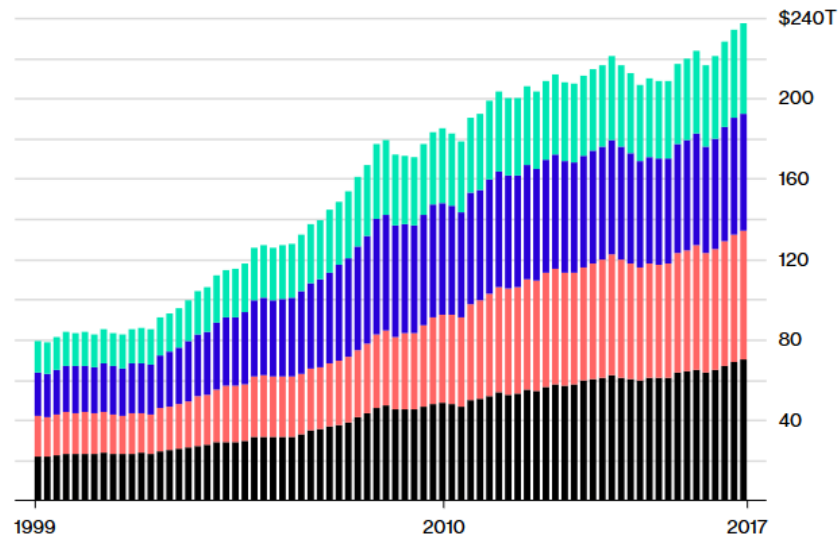
2008-2018: Big Changes

Total Global Debt Stood at \$177tn March 31 2008. By the end of 2017, it had reached \$237tn

A \$237 Trillion Record

Global debt climbed by 42 percent in the fourth quarter from a decade earlier

■ Non-financial corporates ■ Government ■ Financial corporates ■ Households



Source: Institute of International Finance

2008-2018: Big Changes

Significant change in the most active VC lists - due to digitalization and especially due to the next generation mobility mega-trend

Top 10 most active Europe & Israel VC's across the cleantech ("doing more with less") landscape: 2007-08 vs 2017-18

The Most Active VC's (by Rounds Completed, 1 May 2007-30 April 2008)

	Name of VC Fund Manager	Country of Origin
1	Demeter Partners	France
2	Emerald Technology Ventures	Switzerland
3=	Israel Cleantech Ventures	Israel
3=	Northzone Ventures	Denmark
5=	Oxford Capital Partners	UK
5=	High-Tech Gründerfonds	Germany
7=	Scottish Equity Partners	UK
7=	Midroc New Technology	Sweden
7=	Industrifonden	Sweden
7=	Disruptive Capital Finance	UK
7=	BankInvest/NES Partners	Denmark

Source: Cleantech Group

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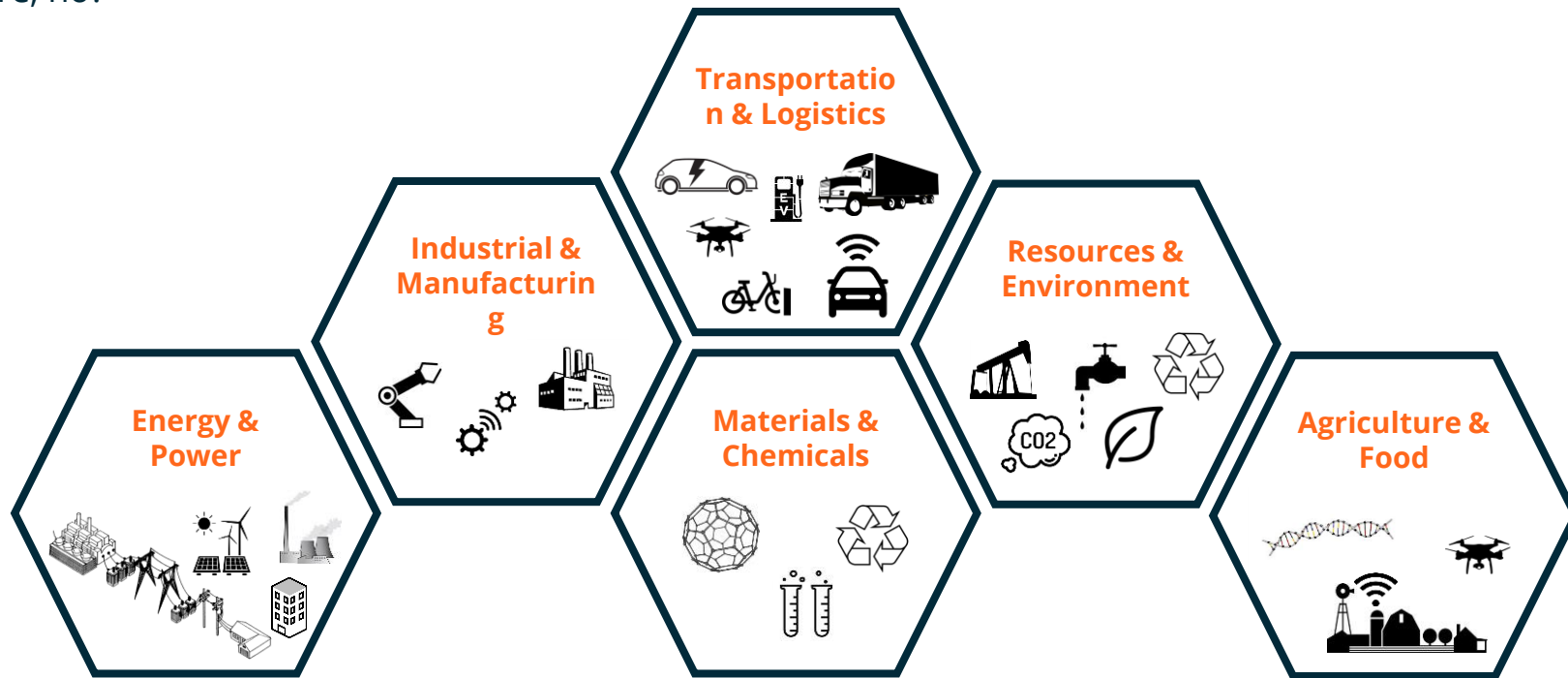
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3	Maniv Mobility	Israel
4	Index Ventures	Switzerland
5=	ALMI Invest	Sweden
5=	ETF Partners	UK
5=	SET Ventures	Netherlands
5=	Via ID	France
5=	Atomico	UK
5=	Lifeline Ventures	Finland
5=	IP Group	UK

Source: Cleantech Group

2008-2018 Shifts: From Curiosity to Acceptance. Old Industries are on Notice

Today, it is 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?



The 2008-2018 Shifts: From If to How and How Fast?

Cleantech Forum® XVII – Brussels

April 28–30, 2008

Hotel Le Plaza, Brussels, Belgium



13:30 – 14:00 **Keynote:**

***Speaker:** Dr. Hermann Scheer, General Chairman of the World Council for Renewable Energy (WCRE); President of the International Parliamentary Forum on Renewable Energies; Member of the German Bundestag*



Tesla Roadster

The 2008-2018 Shifts: From If to How and How Fast?

Tuesday

4:30 PM - 5:30 PM

Gorilla Room 1

Hosted by:



Managing the Ever-Growing Complexity of Distributed Power Assets: Different Models, New Approaches

In this session, co-developed and co-hosted with GE Ventures, we will assemble a group to provide viewpoints on a race to the future – namely, who can crack the nut on how to effectively manage and orchestrate the ever-growing number of distributed energy resources. We believe new problems require new thinking. We believe it would be an error to view the electrification of power grids and transport networks as just a substitution of one form of power for another, and we see plenty of that mindset still apparent. We believe systemic innovation is at play here which will fundamentally change the landscape, and how value is derived, by whom and for whom. It's exciting but



JONATHAN
PULTIZER

Managing Director, GE
Ventures



JAN-WILLEM
ROMBOUTS

Co-Founder & Co-CEO,
REstore



HARI SUTHAN

Chief Strategic Growth
and Policy Officer, Opus
One Solutions



SANDRA TRITTIN

Co-Founder and Head of
Business Development &
Marketing, tiko Energy
Solutions

Wednesday

3:00 PM - 3:50 PM

Marble Hall

Without a Panel: Exploring New Paradigms of Solar Integration

Over recent years, we have seen impressive advancements in a few next generation solar technologies, with the potential to create new markets and opportunities for investors and startups. Developments in power conversion efficiency, production cost and durability is driving commercial deployment. This session will highlight some new potential use cases and the investment potential in areas such as building-integrated photovoltaics, solar-assisted electric vehicles, multi-media mobile displays and tandem cells.



TODD
ALLMENDINGER

Director of Research,
Cleantech Group



CHRIS CASE

Chief Technology Officer,
Oxford PV



GIOVANNI FILI

CEO, Exeger



LAURIN HAHN

Founder & CEO, Sono
Motors



ADAM
TARGOWSKI

Sustainable
Development Manager,
Skanska Commercial
Development Europe

The 2008-2018 Shifts: From If to How and How Fast?

From Models of Car to Models of Business.

Wednesday

2:00 PM - 2:50 PM

Marble Hall

The EV Ecosystem: What are the Opportunities for Incumbents and Innovators?

With electric vehicle fleets growing rapidly and mass adoption around the corner, energy providers, automotive groups and startups alike are competing to capture emerging opportunities. A telling sign is that deal activity has been high in the space, with rising investments, partnerships and acquisitions. But with new business models arising around charging, vehicle-to-grid and financing, the field is still wide open. In this context, who will capture the most value and build a lasting competitive advantage? And how is autonomy changing this emerging picture?



JULES
BESNAINOU

Director, Cleantech
Group (CTG)



DOROTHÉE
COUCHARRIÈRE

International Public
Affairs, BlueSolutions



MATTHEW
LUMSDEN

CEO, Connected Energy

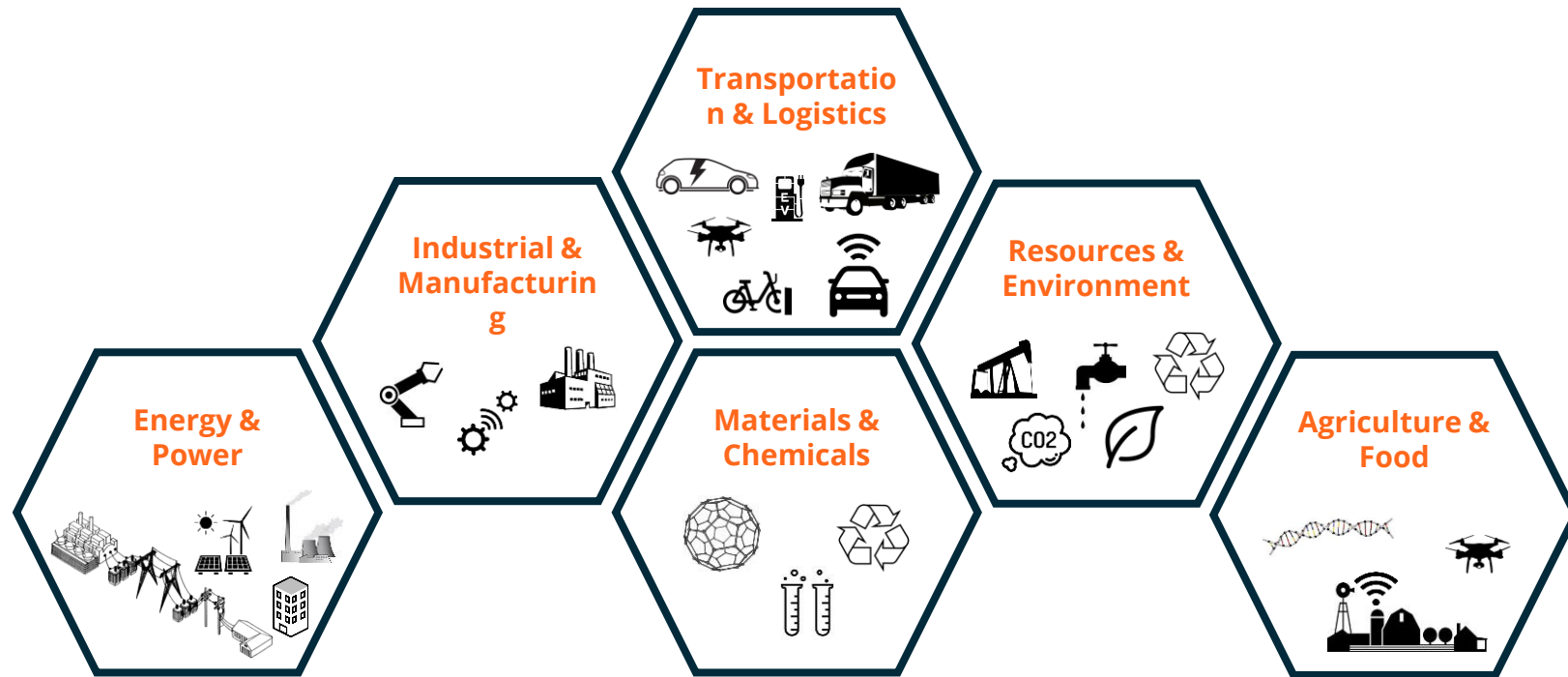


DIETRICH
SÜMMERMANN

CEO, MotionWerk

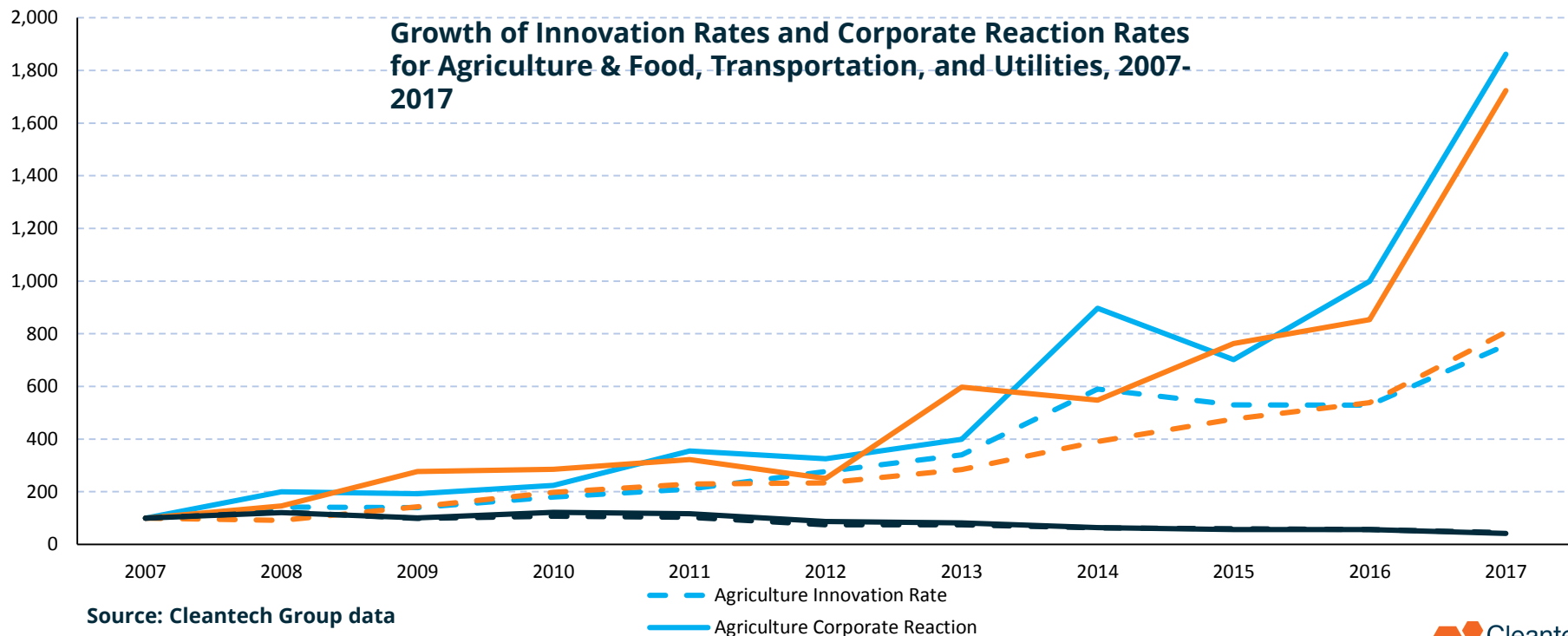
Living on Borrowed Time: Old Industries are on Notice

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Different Industries are feeling the disruption and transition in different ways, at different times, with different levels of intensity.



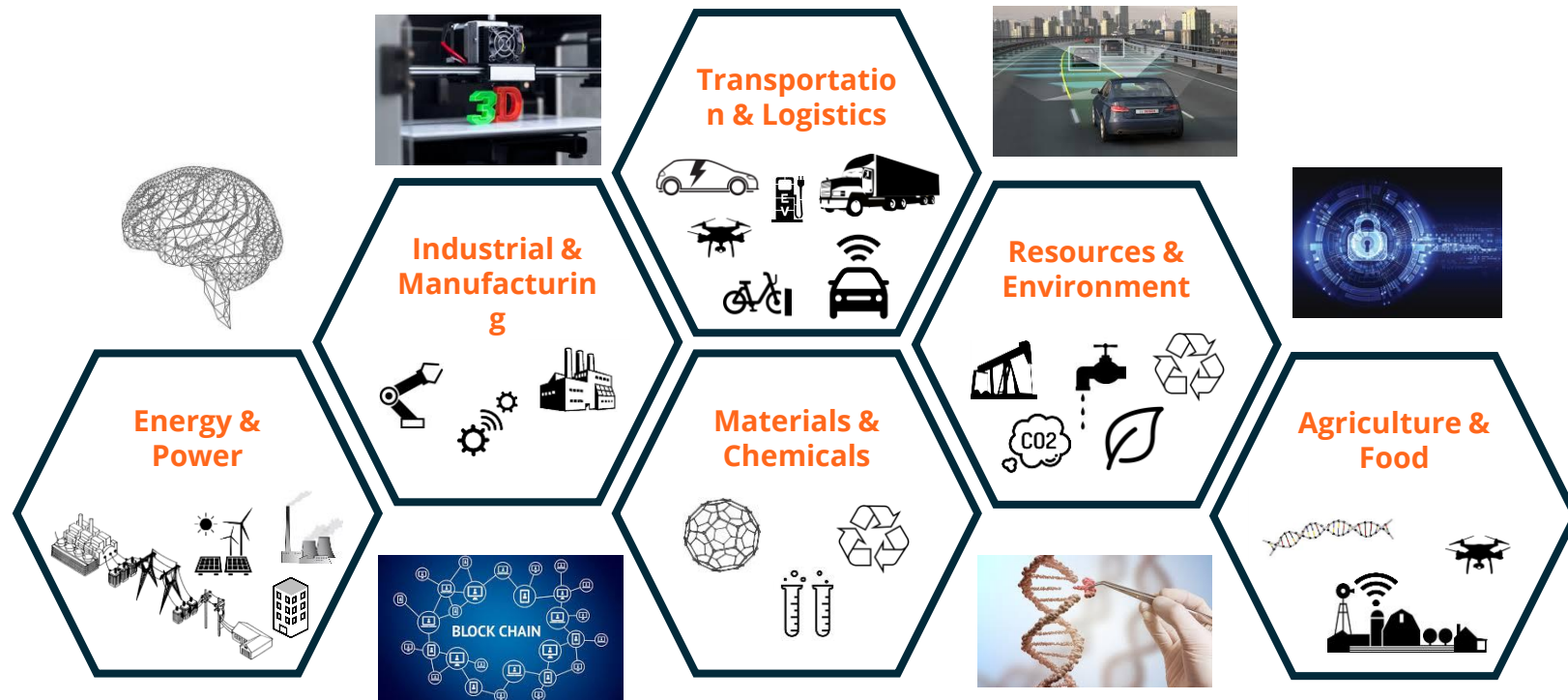
Disruption Intensity: who's feeling it most right now? where's the momentum?

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.



Convergence: 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?

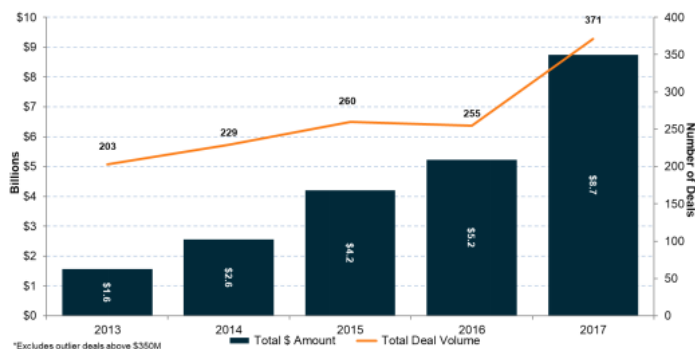


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Growth of Venture & Growth Capital, Transportation and Logistics, 2013-2017: more than 5x increase



Emerging Trends	Some notable 2017 investments
Electric Vehicles	NIO, Singulato, Xiaopeng Motors, WM Motors
Energy Storage	Microvast, SolidEnergy, Skeleton Technologies,
E-Bikes/Scooters	Gogoro, Zero Motorcycles, Alta Motors
EV/Hybrid Trucks	Nikola Motor Company, Hyliion
Freight Logistics	HuoCheBang, Yunmanman, Flexport, Convoy
LiDAR	LeddarTech, Innoviz Technologies, Oryx Vision, Luminar Technologies
Flying Cars	Lilium Aviation, Volocopter, Aeromobil

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

Next Generation Mobility: ready for vertical take-off?

Lilium is the first European company to win our Global Cleantech 100 Early Stage Company of the Year Award

Tuesday

5:40 PM - 6:00 PM

Marble Hall



Closing Plenary: The Future is Electric, The Future is Vertical Take-Off

In the closing plenary of the day, we get the chance to hear from one of the founders of Lilium, the first European company to win the Global Cleantech 100 Early Stage Company of the Year award. Come hear the story of the development of the world's first electric vertical take-off and landing jet, its maiden voyage, and their vision of the future.



PATRICK NATHEN

Co-Founder, Head of
Calculation & Design,
Lilium



Next-Gen Industries and Future Industrial Hubs



**MICHAËL DE
KOSTER**
Head of Innovation
e-Mobility, ENGIE




PHILIP POUILLIE
Chief Operational
Officer – Cluster Gas
North, ENGIE
Generation Europe

Challenges of a decarbonized world


Philip Pouillie
Michaël De Koster



2050, a decarbonized world?

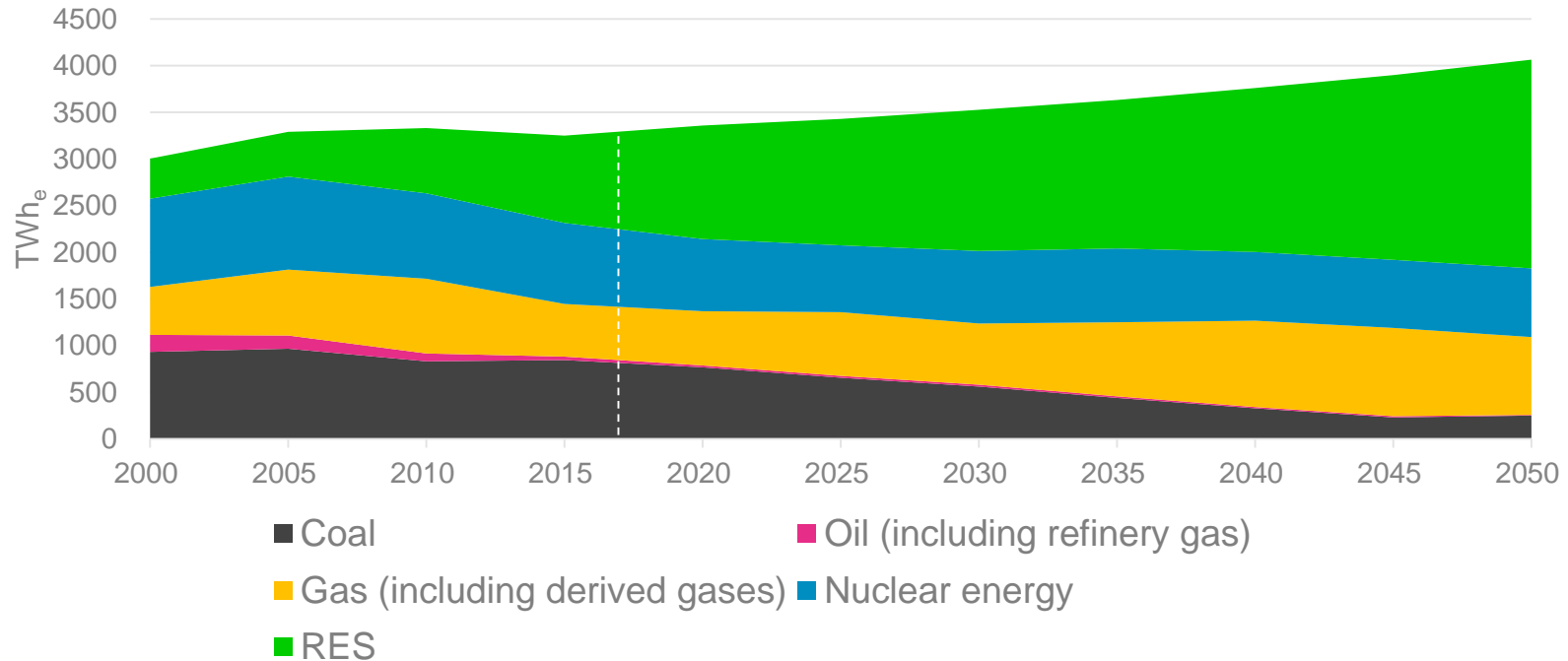


◀ ENGIE plans to switch to 100% renewable electricity and green gas as of 2050 ▶

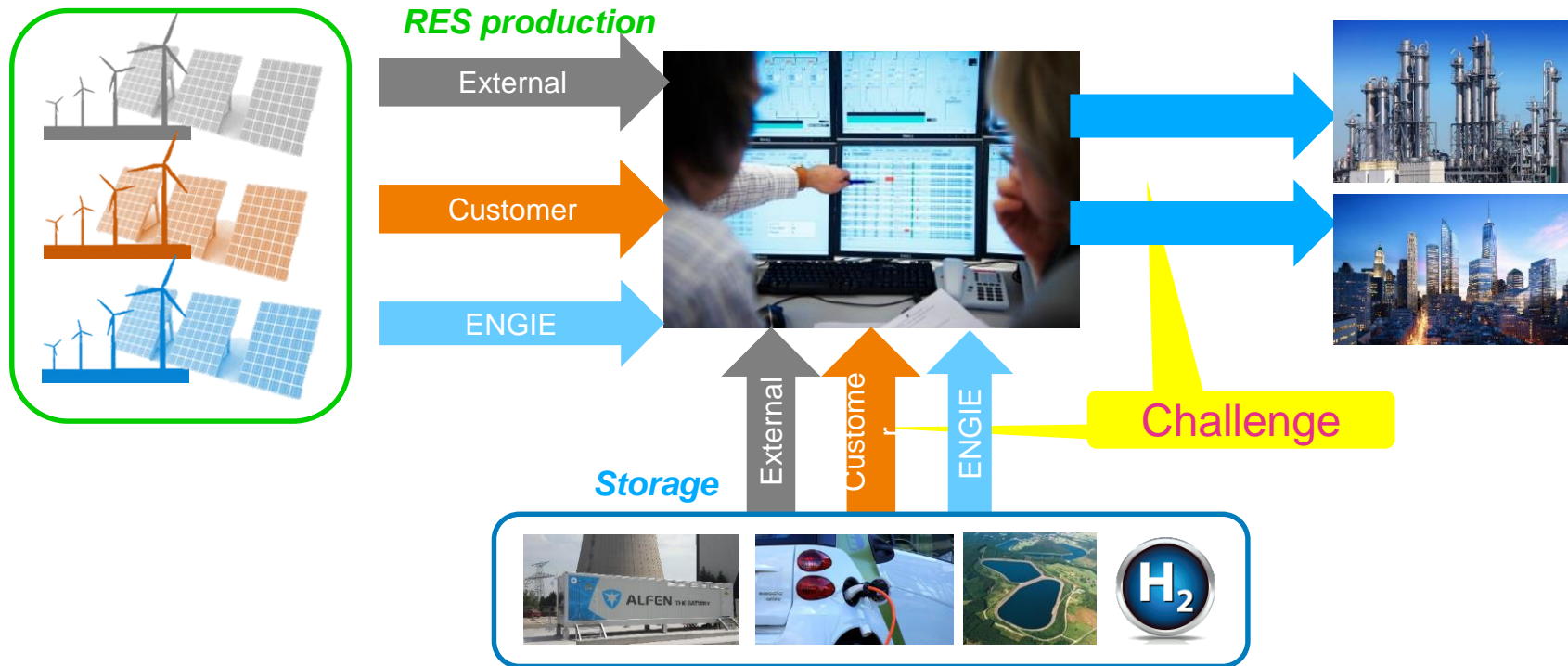


EU28 gross electricity generation (TWh_e)

- Renewables >50%
- Gas will remain in the energy mix



Electricity is becoming a « platform » business



Electricity, a platform business

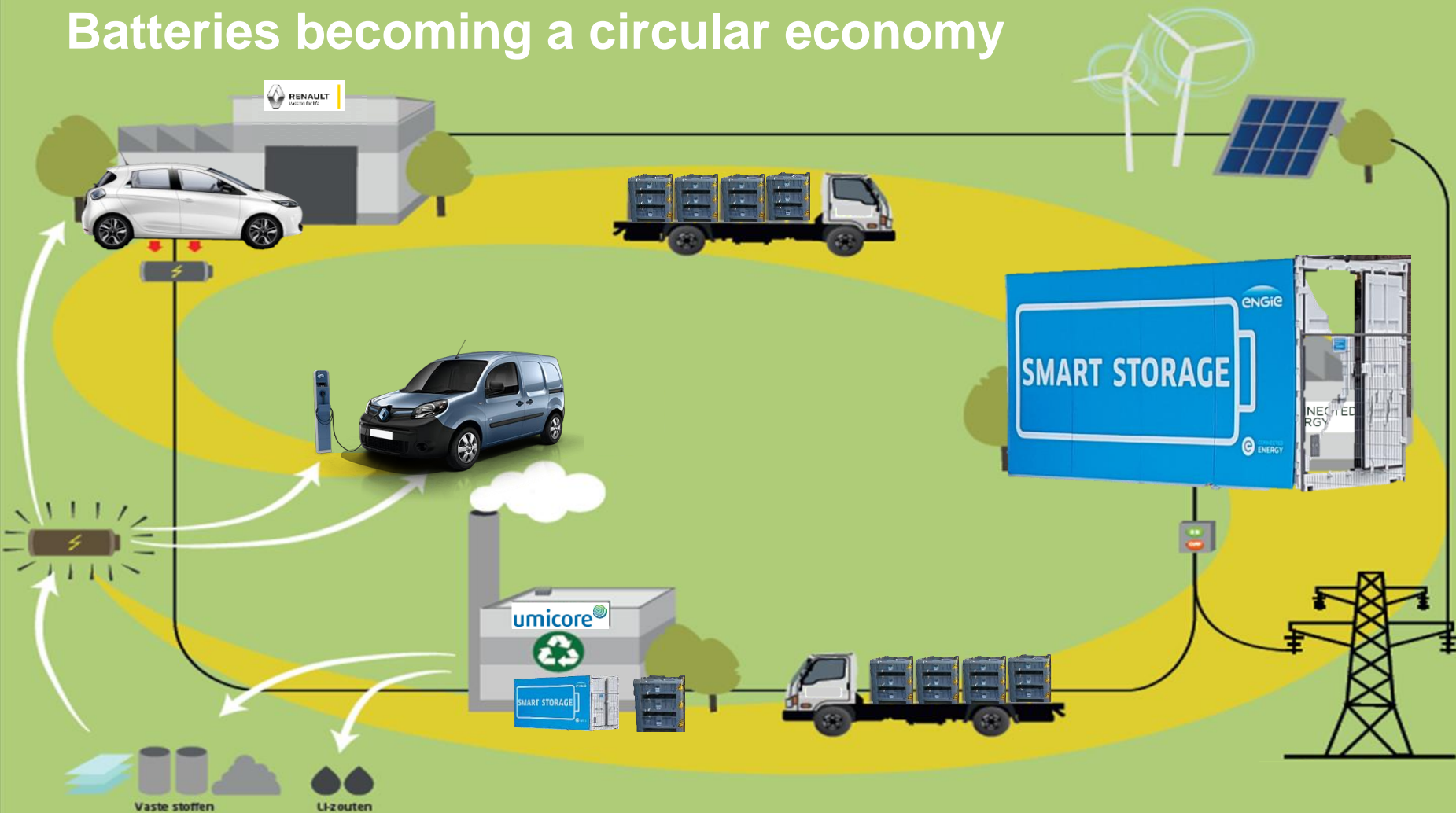
⇒ Innovation in storage



Advanced Microgrid Solutions

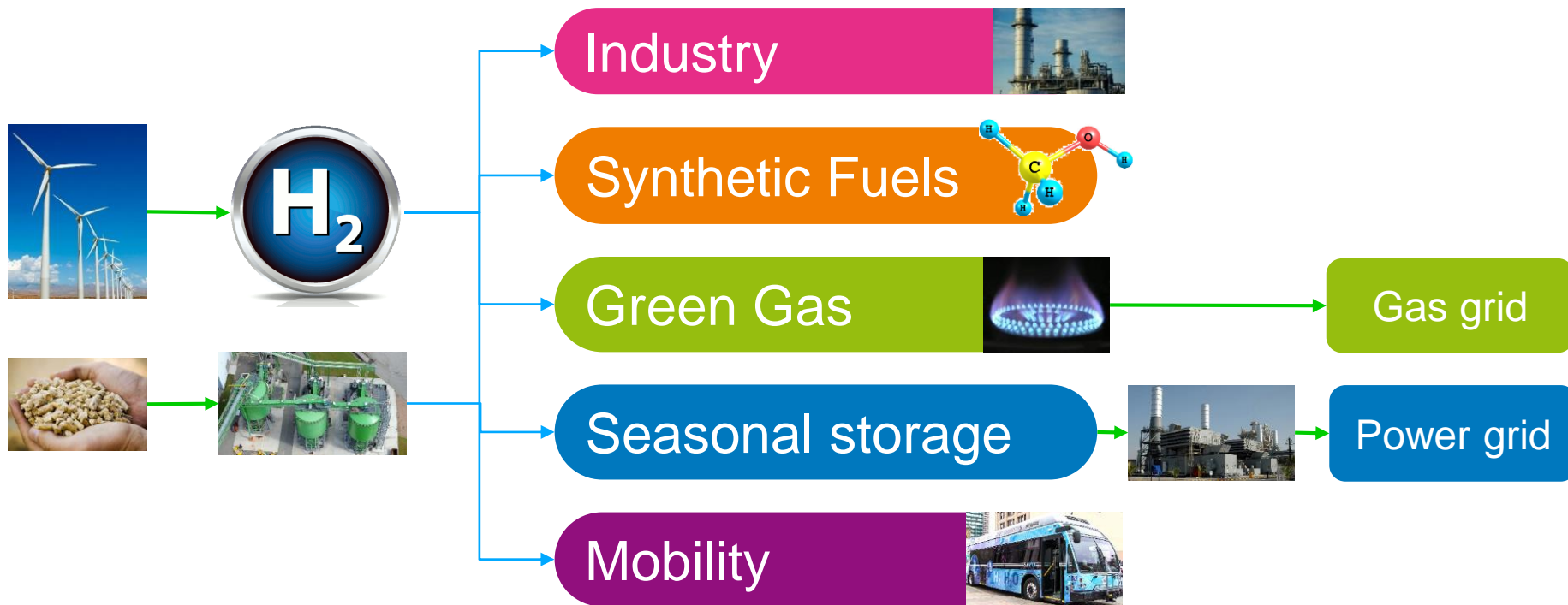


Batteries becoming a circular economy

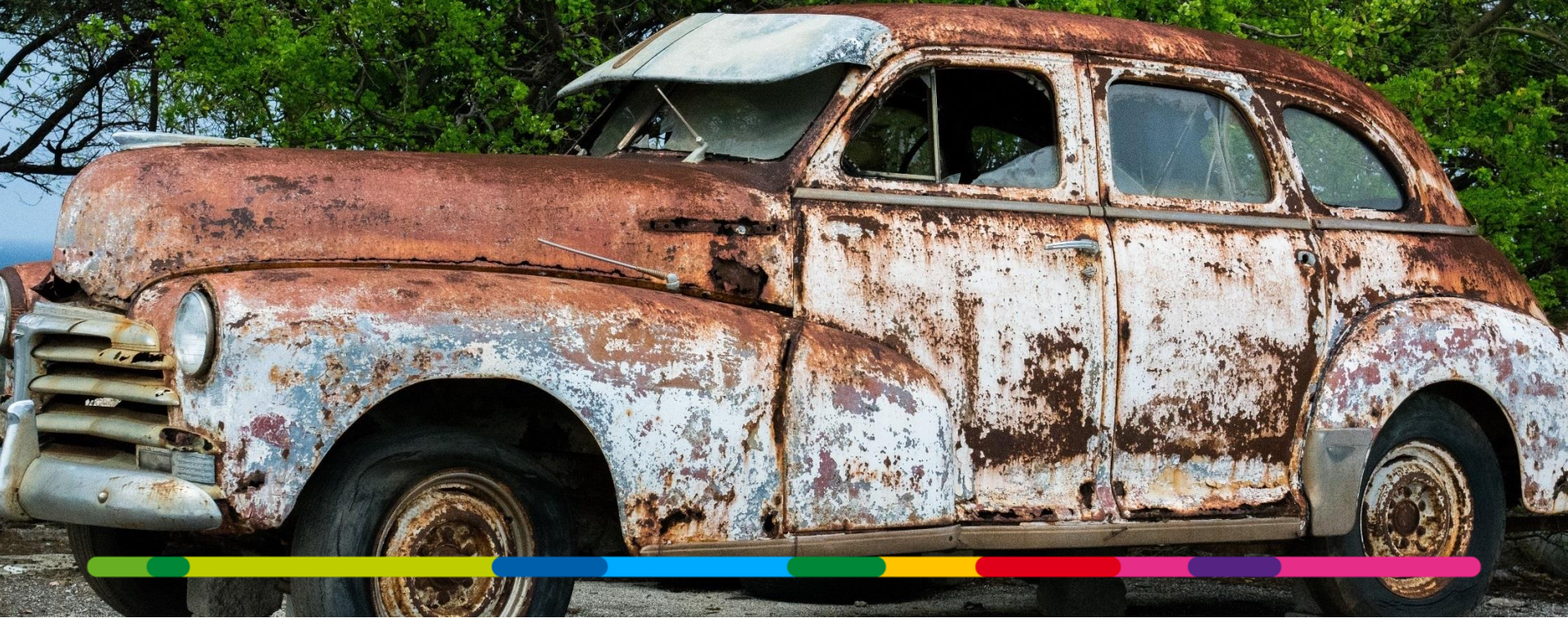


Large scale electrolyzers

opening new markets for energy suppliers



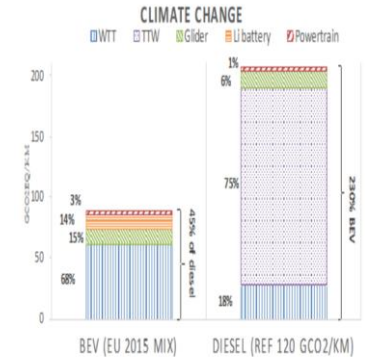
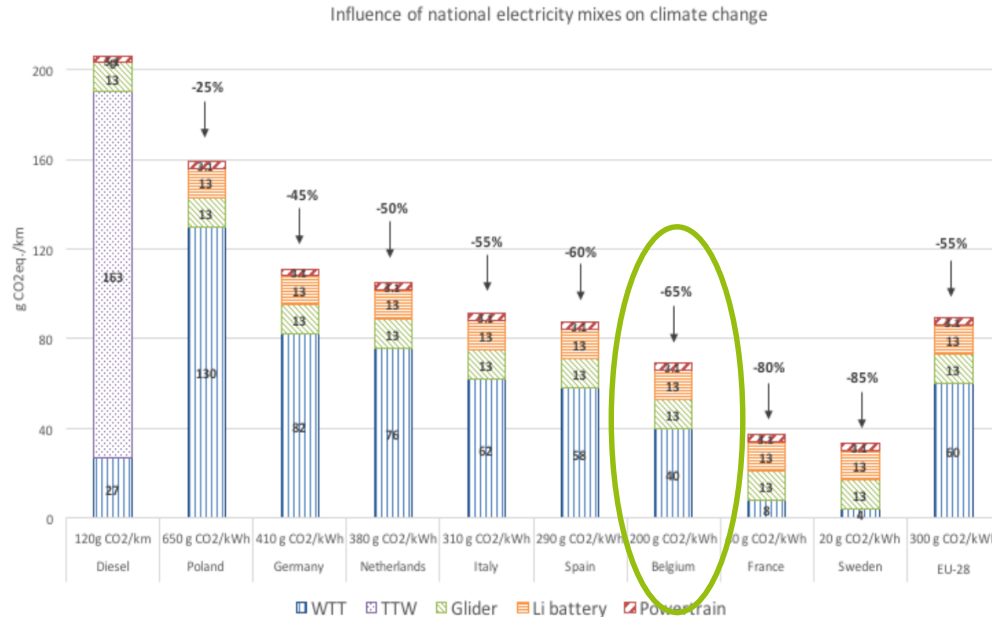
**ARE WE STILL STICKING FOR LONG
WITH OLD COMBUSTION ENGINES ?**



A new Technology disruption is ongoing, based on batteries...
Its adoption could take more than 15 years



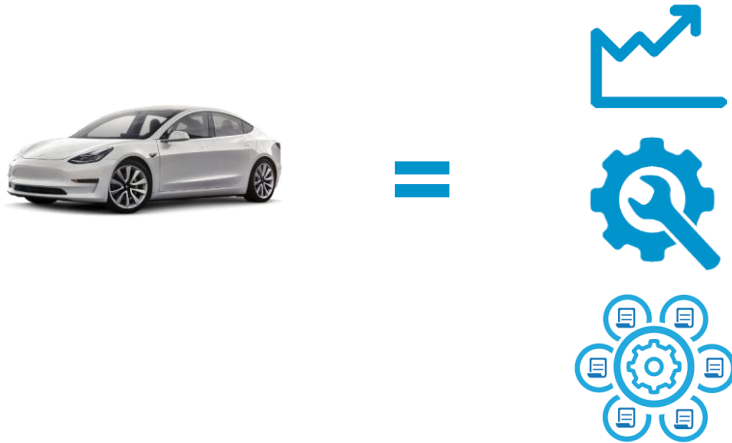
BEVs have significant lower impact on climate change and urban air quality, compared to ICE



Influence of the carbon footprint of national electricity grid on the comparison of life-cycle GHG emissions of BEVs

WHY FOR ENGIE ?

Mobility enters the new energy system, as a future energy user but also as flexibility provider



EVs create a **new electricity use** and **services/platform need** for all customers worldwide, B2C, B2B and B2T

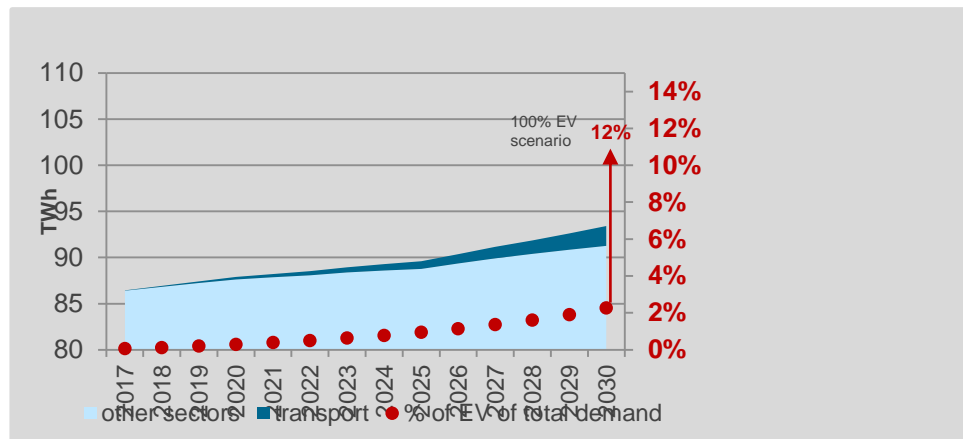


E-mobility becomes a **key storage/flexibility provider** in the **decentralized, decarbonized** and more **digital power system**

The new energy needs is not a specific issue for the 15 coming years



- By 2030, electricity demand reaches **2,5 TWh for 1MEV** or less than 3% of the total demand
- If total car stock is converted into EV, electricity demand from EV moves up to 12% of total demand



Part of EV power consumption in total demand

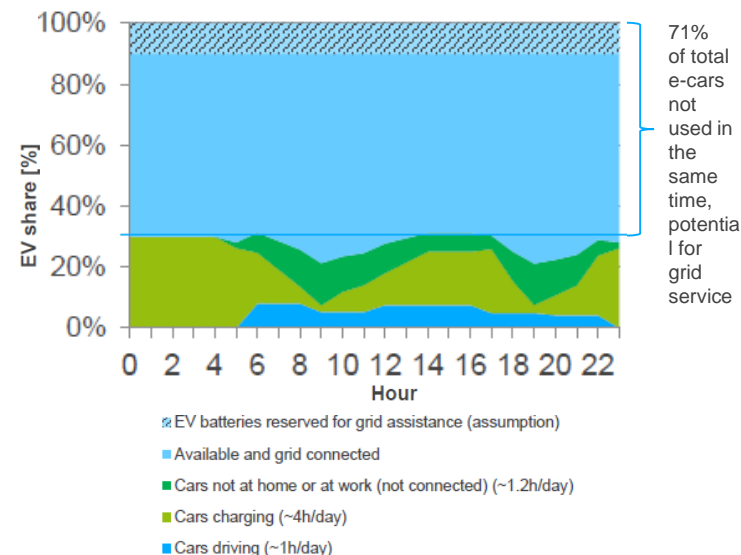
Local and global energy management is an opportunity and a must !



- **1M EV → 40.000 MWh storage capacity.** 5 times the existing capacity. (40 kWh/EV)
- **1M EV → 5 GW installed power with related flex capacity.** Approx.. 50% of the nuclear and thermal capacity. (min 5 kW/EV – charging @ home).
- **Related opportunities to be further developed:**
 - Time of use optimisation
 - Ancillary services, incl. V2X
 - Storage capacity for RES balancing
 - Peak shaving - Local Energy Management
 - Local auto-consumption of renewable power (incl. P2P developments)

E-mobility becomes a key storage and flexibility provider

EVs usage within a day – Horizon 2030



Local Energy Management

Smart charging at office

Advantages:

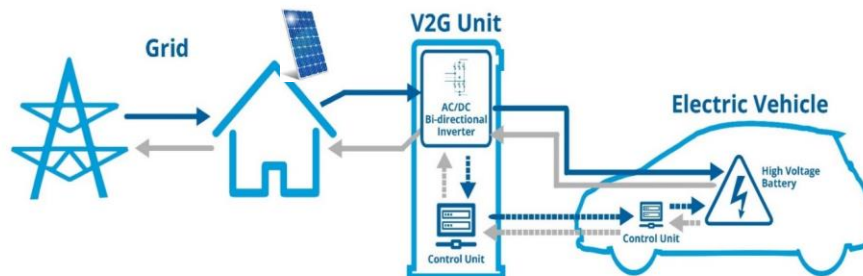
- Important cut in installation costs
- Local electricity Peak Shaving and Grid integration

The charging sequence, as viewed by the user



A Jump in the future...

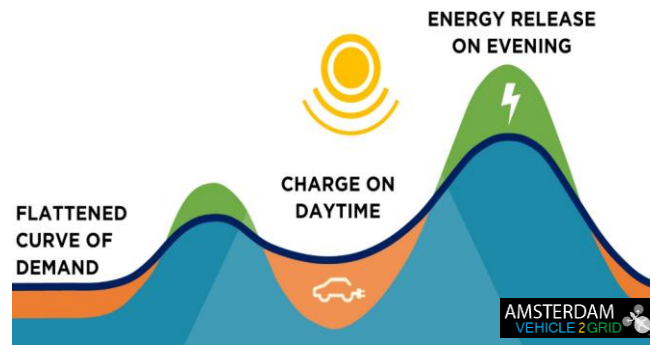
Towards more autonomous buildings and Homes



Food for thought

- Average consumption at home : **10-12 kWh/day** or **50-60 kms EQ**
- Peak consumptions in the morning and the evening when the car is at home...

Towards a new mobile distribution grid ?



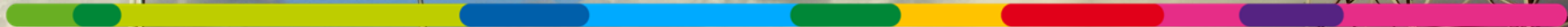
« The future will ...

... be a mixed of green solutions

... open new markets for traditional energy suppliers

... create clusters in the chemical, petrochemical and waste industries

... require centralized platforms »

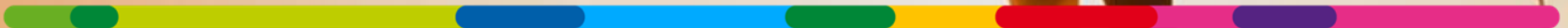


PIONEERS

A person in a flight suit stands on a rooftop, pointing upwards with both hands towards a low-flying airplane against a sunset sky. The person is silhouetted against the bright orange and yellow light of the setting or rising sun. The airplane is visible in the upper right corner, flying towards the left. The overall scene conveys a sense of adventure, exploration, and pioneering spirit.

« As a leading energy company, ENGIE has always been a pioneer, forging a path towards new horizons. »

**Let's discuss it further
on our booth !**



Next Generation Cleantech

De-Centralized, De-Carbonized, and Digitized...

...Next-Gen Industries

...Next-Gen Themes

....Next-Gen Ecosystem

...Next-Gen Finance

2016+: Digital + Industry

Much of our Research work follows the intersect of the physical, industrial, B2B world, with digitalization – with the end purpose of charting the development of the next-gen industrial landscape

Tuesday

2:55 PM - 3:55 PM

Gorilla Room 1

Hosted by:



Innovations for Next Generation Industry: Digital Technologies for the Smart Remediation of Our Planet

Europe is densely populated and heavily industrialized; therefore, land reclamation and efficiency in terms of using existing assets is becoming increasingly crucial. We foresee a growth market in the #greenW economy of contrasted land with the substantial Europe



SEBASTIEN
DEPREZ

Co-Founder, Qweriu



SVEN MOLLET
General Manager, DEME
Environmental
Contractors



ELKE VAN DE
WALLE
Group Manager Legal
Affairs, PMV

Wednesday

11:45 AM - 12:45 PM

Marble Hall

New Value Chains, New Business Types: Digitalization's Power to Disrupt and Transform

In this session, co-developed and co-hosted with BP Ventures, we will showcase new examples of digitalization transforming traditional markets and value chains, as part of our desire to continually challenge our preconceptions and biases about what future industries and their value chains might look like. This trend may have started with the Airbnbs and Ubers, but arguably it is still very early days into the industrial and commercial transformations that digital technologies can enable.



AKIRA KIRTAN
Managing Director -
EMEA & Asia, BP
Ventures



CLIVE JACKSON
Founder & CEO, Alyssum
Group



MARCIN KULIK
CEO, ARAVATO



FELIX LEUSCHNER
Founder & CEO, Drover



HUMERA MALIK
CEO, Canvass Analytics

Hosted by:



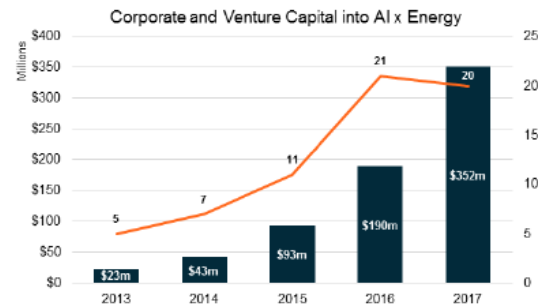
2016+: AI Meets Energy & Industry

AI is finding applications across the entire span of value chains

AI IN THE ENERGY VALUE CHAIN

BY JULES BESNAINOU, DIRECTOR, CTG AND RUBINA SINGH, RESEARCH ASSOCIATE, CTG

AT THE CUTTING EDGE



Wednesday

10:10 AM - 11:00 AM

INTERACTION TRACK

Gorilla Room 4

Top 2017 Deals in Chinese AI Start-Ups

Company	Description	Round Size	Investors
Huashan Robotics (上海机器人)	Developer of AI solutions including processors, hardware, software, cloud computing and big data	\$100M Series A	Intel Capital, Morningside Ventures, Hillhouse Capital, Linear Venture, Wu Capital, Harvest Investments
Cambricon	Developer of artificial intelligence chips for deep learning	\$100M Series A	SDIC Chuangye Investment Management, Ane Financial, Lenovo Group, CAS Investment Management, Oriza Ventures, Yonghua Capital
Geek+	Developer of robots for logistics and warehousing efficiency solutions	\$60M Series B	Warburg Pincus, Vulcanic Stone Investment
优必选 (UBTECH)	Developer of machine vision technology for robotics, industrial automation and augmented reality	\$20M Series B	Wu Harper Group, SoftBank, China Fortune-Tech Capital Co, Tus-Holdings, TusStar, Flyfor Ventures
先声智能 (JH CANG)	Provider of machine learning technology and operations research algorithm for logistics companies	\$3M Series A	Shenzhen Albatross Capital, BlueRun Ventures China

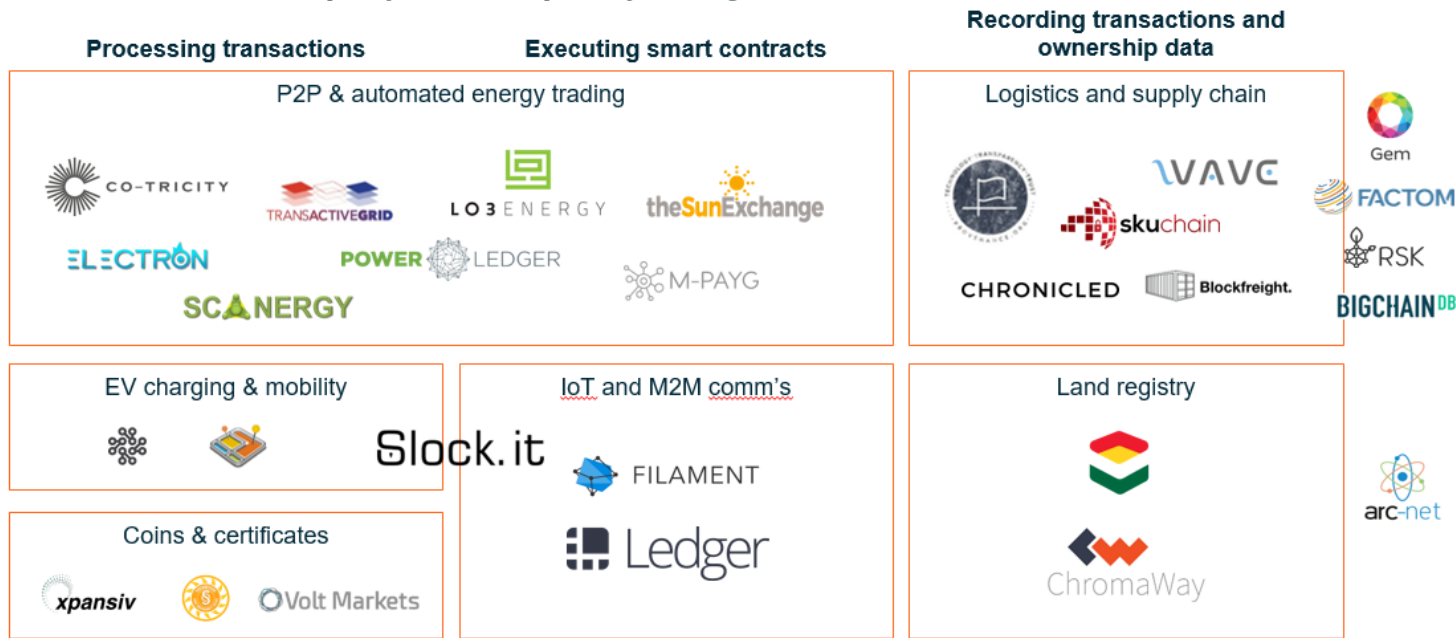
Source: CTG Insights, February 2018

Source: CTG Insights, December 2017

2016+: Blockchain Meets Energy & Industry

////////////////////////////////////
We have been charting the path of Blockchain's intersection with Energy & Industry since Q1 2016.
It's going to be a ride!

The Innovation Company Landscape, 1 year ago



Source: Cleantech Group data

2016+: Blockchain Meets Energy & Industry

////////////////////////////////////

We have been charting the path of Blockchain's intersection with Energy & Industry since Q1 2016. The next candidate to prove out Amara's Law, and to journey through the Hype Cycle?

The Innovation Company Landscape Today



Source: Cleantech Group data

2016+: Blockchain Meets Energy & Industry

Our focus this year is to identify who can take this from “interesting” concepts to scaled-up significance. That is the challenge for the start-ups: the race is on.

Tuesday

2:00 PM - 2:45 PM

Gorilla Room 1

Blockchain in Energy: The Scale-up Race

This will be the 3rd year we feature blockchain startups at Cleantech Forum Europe. In this time, the ecosystem has changed radically. On the financing side, traditional venture capital involvement has been dwarfed by the rise of ICOs. Corporates have adopted the consortium model while continuing to push on internal pilots. Innovators themselves have multiplied, and some of them have morphed from startups to crypto-ecosystems. In this context, all efforts are concentrated on scaling up solutions and deployments. Will 2018 be the year of production-scale blockchain in energy?



JULES
BESNAINOU

Director, Cleantech
Group (CTG)



HENK JAN
BRAGGAAR

Co-founder, Clearwatts



MARIA
MCKAVANAGH

COO, Verv



ANA TRBOVICH

Co-Founder & Co, Grid
Singularity; Foundation
Council Member, Energy
Web Foundation

2016+: Gene Editing and the Future of Food and Feed

Significant global investment in genomic-related companies, 2016-17.
Ag & Food is the main area of crossover today (from the health world).

GENETIC ENGINEERING AND AGRICULTURAL INNOVATION

BY: CHRIS SWORDER, ANALYST, CTG & JONATHAN KOCH, JUNIOR ANALYST, CTG

DISSONANCE & DISRUPTION

CTG Insights will provide you with a steady flow of signals we see as interesting and important indicators of a changing operating context.

It is likely that you have heard of CRISPR, the new tool available to genetic engineers. It is likely that you have discussed genetically modified organisms (GMOs) and their potential impact. However, we think there are some questions that could do with answers: what impact is genetic engineering going to have on agricultural cleantech, and how did we get here?

As can be seen in Figure 1, one thing is relatively clear: investment in genomic-related companies has grown significantly over the past two years, with 2017 showing a high deal volume despite posting a lower dollar amount than 2016. As will be shown below, the high deal volume correlates with the latest advances in genetic engineering technologies coming into play in the last four years.

Gene editing can have applications in a variety of industries, from human therapeutics, gene drives, drug discovery, industrial biotechnology, and more.

However, we are focusing on the impacts we are seeing in the agriculture & food space, looking at plant and livestock genomics, and relevant platform technologies that are industry-agnostic but with applications in ag & food.

Why are we talking about this?

Pressure on global resources to support our food system is growing, and even outpacing ability to meet demand. Genetic engineering is a useful tool to maximize yield in an increasingly resource-stressed world.

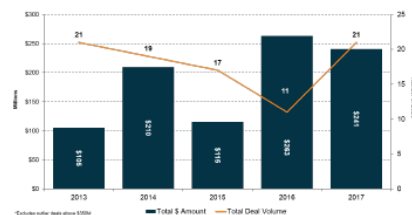


Figure 1: Venture capital dollar amount (\$) and deal volume in genomics companies over the past 5 years

2016+: Gene Editing and the Future of Food and Feed

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Ag & Food is the main area of crossover today (from the health world).

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■ DISSONANCE & DISRUPTION

CTG Insights will provide you with a steady flow of signals we see as interesting and important indicators of a changing operating context.

It is likely that you have heard of CRISPR, the new tool available to genetic engineers. It is likely that you have discussed genetically modified organisms (GMOs) and their potential impact. However, we think there are some questions that could do with answers: what impact is genetic engineering going to have on agricultural cleantech, and how did we get here?

As can be seen in Figure 1, one thing is relatively clear: investment in genomic-related companies has grown significantly over the past two years, with 2017 showing a high deal volume despite posting a lower dollar amount than 2016. As will be shown below, the high deal volume correlates with the latest advances in genetic engineering technologies coming into play in the last four years.

Gene editing can have applications in a variety of industries, from human therapeutics, gene drives, drug discovery, industrial biotechnology, and more.

However, we are focusing on the impacts we are seeing in the agriculture & food space, looking at plant and livestock genomics, and relevant platform technologies that are industry-agnostic but with applications in ag & food.

Why are we talking about this?

Pressure on global resources to support our food system is growing, and even outpacing ability to meet demand. Genetic engineering is a useful tool to maximize yield in an increasingly resource-stressed world.

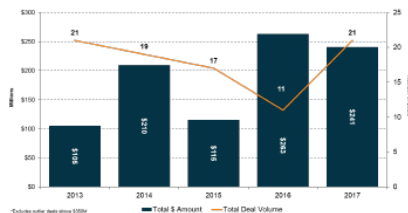


Figure 1: Venture capital dollar amount (\$) and deal volume in genomics companies over the past 5 years

Tuesday

2:00pm - 5:30 pm

This 3-part Sustainable Chemistry half-day track has been co-created with the advice and support of:



The Pioneers in Biomass and Biotechnology: Where is Bio-based Chemical Innovation Today?

From Thermal and Global to Electric and Local: Is the Chemical Industry Set for Radical and Disruptive Change?

Food, Feed and Agriculture: It's All About Chemistry

2017+: Don't Write off Fusion Energy!

Our focus this year is to test business-readiness. Is there a place for fusion in the future energy mix? How and when?

Wednesday

10:10 AM - 11:00 AM

Marble Hall

Fusion Energy: Clearing the Path to Commercialization, Identifying the Business Case in the Next-Gen Clean Energy Portfolio

With the amount of money, energy and talent that the private sector is now pursuing the fusion energy dream, it becomes quite a reasonable bet that human ingenuity will crack the technological challenges. But will it find its place in the future (clean) energy mix? Will fusion arrive in time to play a significant role in the future energy mix, and will the world be ready for it, from a regulatory perspective? What will be the business case for fusion, and the application areas it can address? How will its costs stack up versus the ever-reducing costs profile of solar and wind, and now in combination with storage? Following on from fusion's debut at a Cleantech Forum Europe last year, where the focus was on 101-style education, this year we wish to push on the discussion into these key commercial questions.



**IRENA
SPAZZAPAN**

Partner, SYSTEMIQ



**PETER
MOLENGRAAF**

Entrepreneur & Former
CEO, Alliander



KLAAS DE BOER

Board Member, General
Fusion



PAUL BOWDEN

Partner, Freshfields
Bruckhaus Deringer



BART MARKUS

Chairman, First Light
Fusion

2017+: Space: the next Frontier and Platform for Next Generation Industries?

Our objective is to open our minds to the possibilities of how Space might feature in the industrial landscape of the 2020's and beyond.

NEXT-GEN SPACETECH - INITIATING COVERAGE

BY JOSH GILBERT, ANALYST, CTG & JONATHAN KOCH, JUNIOR ANALYST, CTG

AT THE CUTTING EDGE

Our At the Cutting Edge series will keep an eye out, cut through the hype, and give early warnings on trends we believe will be important enablers of future innovation waves. Expect articles and interviews on topics like 5G, gene editing, virtual reality, artificial intelligence and more.

Key takeaways:

- Introducing space technology (spacetechnology) as a CTG coverage area
 - What are the converging trends driving the surge of innovation in spacetechnology?
 - Which use cases show how spacetechnology is relevant to CTG's existing sectoral focus?
-

Source: CTG Insights, October 2017

2017+: Space: the next Frontier and Platform for Next Generation Industries?

Our objective is to open our minds to the possibilities of how Space might feature in the industrial landscape of the 2020's and beyond.

Tuesday

2:00 PM - 2:45 PM

INTERACTION TRACK

Gorilla Room 4

Next-Gen Space Technologies: Cleantech's Next Frontier

In recent years, space-based industry has developed rapidly, offering an opportunity to both investors and startups to capitalize on this emergent value proposition. In this session, we will feature innovators who are looking to outer-space for answers to earth's most pressing questions. From nanosatellites & earth observation, to asteroid mining and solar sails, we will highlight those at the very cutting edge of the new space industry.

[READ MORE](#)



JOSH GILBERT

Analyst, Cleantech Group



PETE WORDEN

Executive Director,
Breakthrough Starshot;
former Director of NASA
Ames Research Center



MATEUSZ
JÓZEFOWICZ

CEO, ABM Space



RAYCHO RAYCHEV

CEO,
EnduroSat/SpaceEdu

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- Introducing space technology (spacetechn) as a CTG coverage area
- What are the converging trends driving the surge of innovation in spacetechn?
- Which use cases show how spacetechn is relevant to CTG's existing sectoral focus?

Source: CTG Insights, October 2017

2018+: Smart Energy, Smart Home, Smart Services

A classic example of convergence. Relevant to the future of utilities?

Tuesday

2:55 PM - 3:55 PM

INTERACTION TRACK

Gorilla Room 4

Connecting and Caring: The How and the Who of Smart Services to Support an Ageing Society

Ageing societies are a mega-trend: life expectancy is increasing on average by five hours a day. As we move towards a population that lives longer, has the desire to live better and also more independently, society needs to find ways to accommodate this, and businesses need to consider the opportunity set. In this session, we shall explore emerging tech-enabled ageing services, and their intersection with the smart home. Is this a new area that those supplying services to the home, like utilities, should be focusing on? Come discover why Cleantech Group (CTG) thinks this is a trend many of you should be paying some attention to.



 TODD
ALLMENDINGER

Director of Research,
Cleantech Group



VICTOR MATIA

Co-Founder, Noho



RUTH POLIAKINE
BARUCHI

Founder & CEO,
MyndYou



SAM SALISBURY

Director, Centrica
Innovations Labs



FRANÇOIS
GERARD

Founder & Director,
Helper



Next Generation Cleantech

De-Centralized, De-Carbonized, and Digitized...

...Next-Gen Industries

...Next-Gen Themes

...Next-Gen Ecosystem

...Next-Gen Finance

January 2018

2008-2018: The Rise of the Corporation in Cleantech

Steady Increase in Corporate Open Innovation Activity. Some Individual Corporates Come And Go, but in aggregate the engagement of corporations in “open innovation” keeps increasing.

Top 5 most active European-headquartered CVC's across the cleantech/“doing more with less” landscape, 2007-08 vs 2017-18

The Most Active CVC's (by Rounds Completed, 1 May 2007-30 April 2008)

	Corporation	HQ
1=	Volvo Group Venture Capital	Sweden
1=	Scottish & Southern Energy (SSE) Ventures	UK
3=	Siemens Venture Capital	Germany
3=	BASF Venture Capital	Germany
5	DSM Ventures	Netherlands

Source: Cleantech Group data

The Most Active CVC's (by Rounds Completed, 1 May 2017-30 April 2018)

	Corporation	HQ
1	Daimler	Germany
2	Shell Ventures	Netherlands
3	Innogy Venture Capital	Germany
4	Syngenta Ventures	Switzerland
5=	ENGIE New Ventures	France
5=	InMotion Ventures (Jaguar/LandRover)	UK
5=	Statkraft Ventures	Norway (Germany)



Next-Gen Industries and Future Industrial Hubs

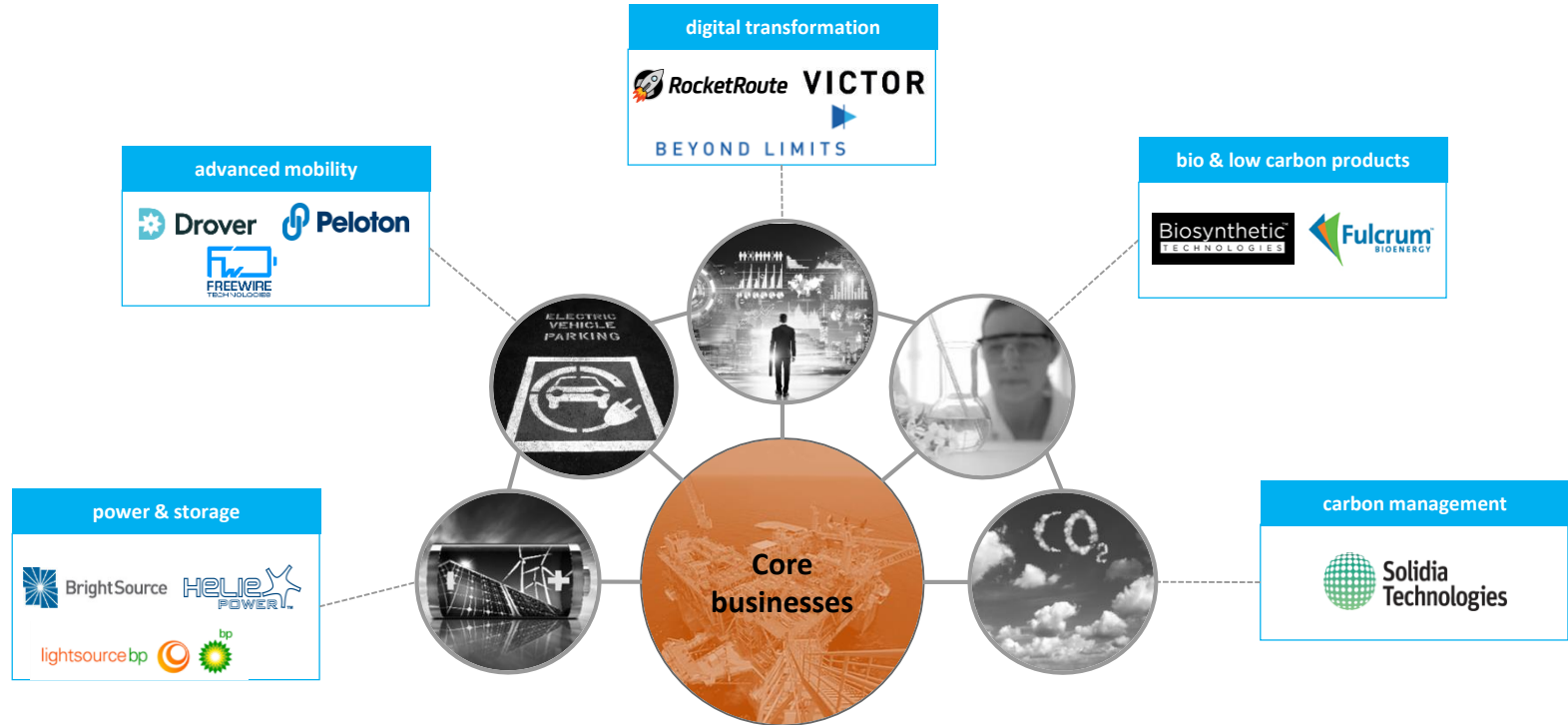


AKIRA KIRTTON

Managing Director - EMEA & Asia, BP Ventures



Venturing on multiple-fronts



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

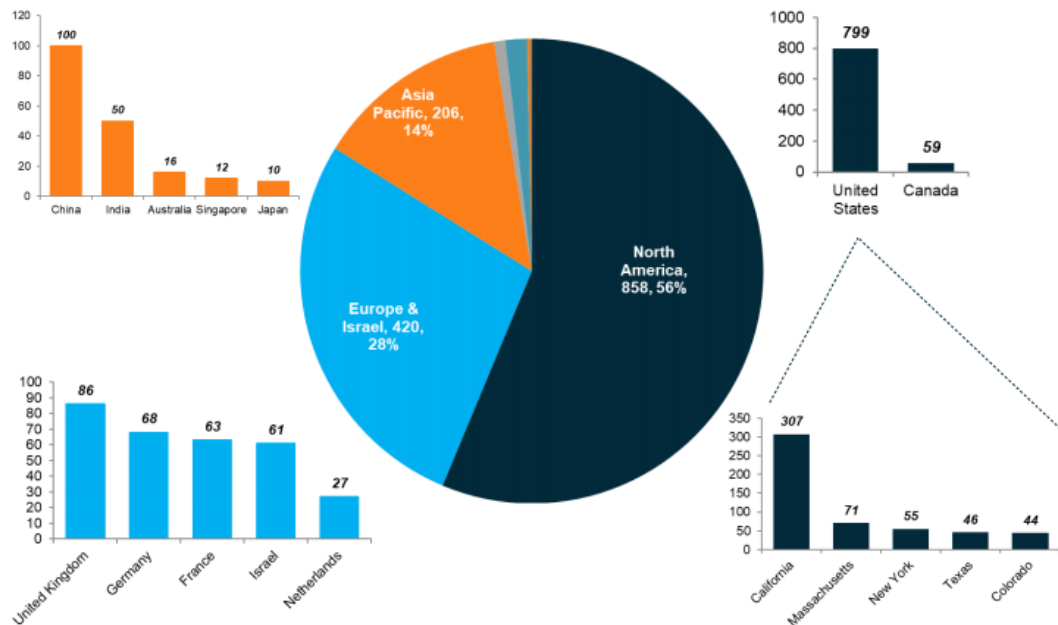
Investor	Size	Investment Orientation/Language	Illustrative Portfolio Companies
 SoftBank	\$93 Billion	"Enabling the new age of innovation"	      
 TPG Rise Fund	\$2 Billion	"achieving social and environmental impact alongside competitive financial returns"	  
 OGG <small>OIL AND GAS CLIMATE INITIATIVE</small>	\$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 "	  

Source: Cleantech Group data

Geographical diversification of innovation continues

Asia, powered by China, is the significant mover of the past few years.

2017 Global Investment Rounds, by Region

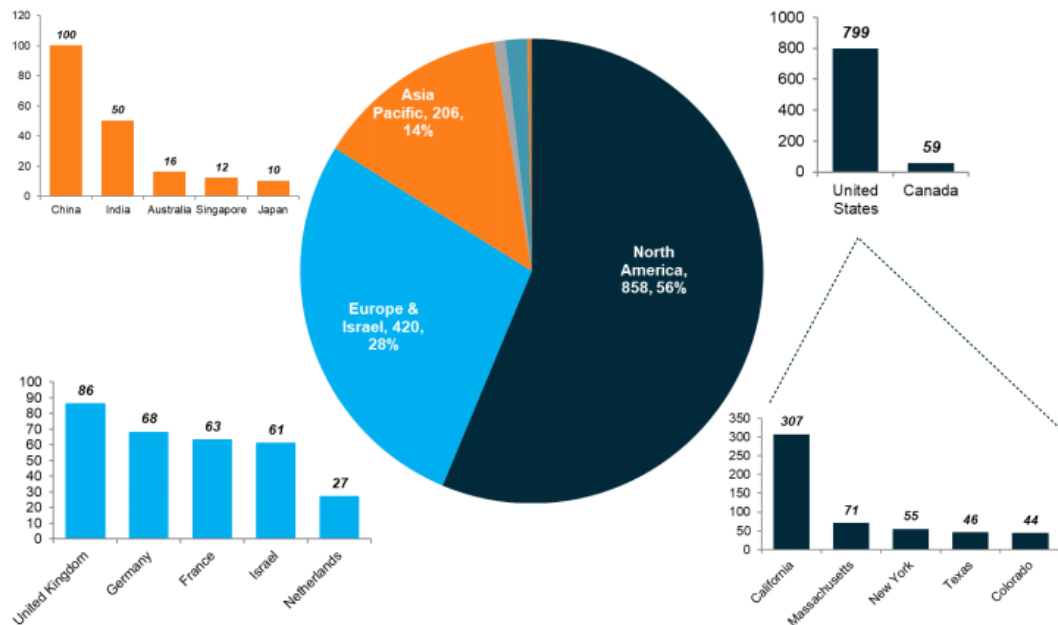


Source: Cleantech Group's Quarterly Investment Monitor, Q4 2017

Geographical diversification of innovation continues

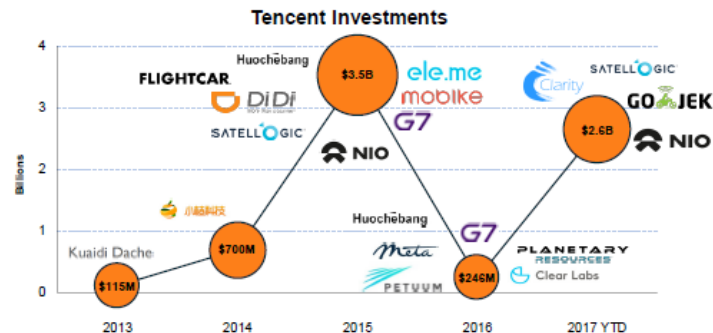
Asia, powered by China, is the significant mover of the past few years.

2017 Global Investment Rounds, by Region



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

Tencent: one of many to watch



Source: CTG Insights, August 2017

AsiaConnect Week: One Week, Two Events, November 12-16, 2018

Who Should Attend and Why

- You are an **Asia-based investor and/or an Asian corporation**, looking to find and connect with some of the best of global innovation, with solutions relevant to China and/or the south-east Asian region.
- You are a **financial or corporate investor from outside Asia**, looking to find co-investors, strategic partners for your portfolio companies, LPs for your fund, etc.
- You are a **young company at startup or scale-up stage** with a relevant solution to China &/or the south-East Asian region. For 48 hours, you will have the chance to meet a wide range of investors and corporations not normally all together in one place.
- You are a **public sector agency** with a mandate to help companies assess the market opportunity and expand into China and/or the Southeast Asian region.
- You are looking to **get up-to-date information on innovation trends and players in Asia** for strategic planning purposes.
- You like high energy, positively-minded events for people who want to get things done, making good by doing good.



November 15-16, 2018, Nanjing, China

CTG will run an independent “**Next Gen Energy & Industry**” Innovation Summit within **CleanConnect**, a 4-year old event run by Umore Consulting.



Next-Gen Industries and Future Industrial Hubs



RONG XU

Founder & CEO, Umore Consulting

Next Generation Cleantech

De-Centralized, De-Carbonized, and Digitized...

...Next-Gen Industries

...Next-Gen Themes

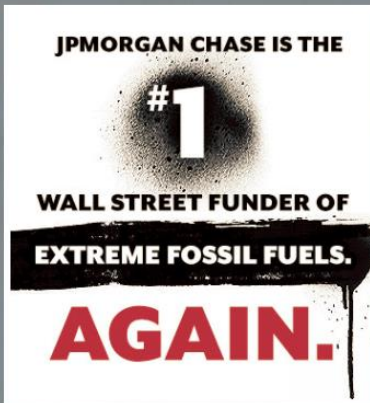
...Next-Gen Ecosystem

...Next-Gen Finance

Next Generation Finance: Significant Change is Afoot

“Big Finance” can have a big impact on the speed and nature of the transitions of energy and the industrial landscape, as a whole.

Banking On Climate Change **AT A GLANCE**



RAINFORREST
ACTION NETWORK

BANKTRACK

HONOR
EARTH

INDIGENOUS
NETWORK

OILCHANGE
INTERNATIONAL

SIERRA
CLUB

Source: Fossil Fuel Finance
Report Card 2018



Next-Gen Industries and Future Industrial Hubs



ANTOINE SIRE

Director of the Company Engagement Department and
Member of the Executive Committee, BNP Paribas

BNP PARIBAS

ENERGY TRANSITION CLEANTECH FORUM 2018

ANTOINE SIRE

Anvers, May 2018



BNP PARIBAS

The bank for a changing world

BNP Paribas is committed to accelerating energy transition by applying the following approach to financing our clients

Reduce our Carbon Exposure

- Stop financing
 - Coal, unconventional oil and gas, nuclear power plants*
- Accompany clients in their energy transition transformation

Increase Renewable Energy Financing

- Set ambitious objectives
 - 15.0b € (2020) from 12.3b € (2017)
- Embed in each business lines' strategy
 - Green Desks (medium sized projects)
 - CIB (large sized projects)

Provide Innovative Solutions Across the Group

- CIB, Retail Banking, Personal Finance, Arval, Asset Management, Leasing Solutions, Real Estate,...
- 100m € investment in innovative energy transition startups

*limited



While ensuring a holistic approach to engagement with all our stakeholders



1 Carbon neutrality for our own energy consumption

2 Initiatives with partners tackling climate change

- Ellen MacArthur
- Solar Impulse
- Montreal Carbon Pledge

3 Commitments to climate change research and awareness

- Climate Initiative
 - 6m, 178, 73, 8
- One Planet Fellowship Program (Bill and Melinda Gates Foundation)
 - 15m, 120, 240, 240



Next Generation Finance: 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 Generation Finance: Significant Change is Afoot

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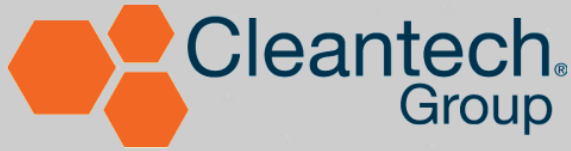
ALL RAISE

"Dedicated to diversity in funders and founders"

#FoundersForChange

"It was counterintuitive for us to raise money from a bunch of white guys who want to extract all the value from the world. We're interested in reshaping the way that tech looks."

— TREVOR MCFEDRIES, BRUD



Charting the future, Connecting the globe.

Prepared by:

Richard Youngman
CEO, Cleantech Group
richard.youngman@cleantech.com

May 2018



Cleantech Forum **Europe**

Antwerp | May 14-16, 2018



Cleantech Forum Europe Reception, Dinner & Awards



For those who are confirmed for the annual **Cleantech Forum Europe Dinner** (a sticker will be on the back of your badge with your **table number**), please note the City has provided us special chartered trams, to take you to Richard Rogers' "Butterfly Palace".

Transportation

There will be **two trams** leaving from the nearby underground Premetrostation Astrid (platform 8), just across the square from the main venue. The trams depart at **6:50PM** and **7:05PM** for the 15-minute trip to the New Palace of Justice. "Guides" will depart from here at **6:35PM** and **6:50PM**

There will be two return trips following the end of the dinner at **10:45PM** and **11:15PM**.

See page 5 in the program guide for more details.



Cleantech Forum **Europe** | Antwerp

Glimpses of Tomorrow's Future In Action Today: Flemish Flavor, Global Implications

You have the chance to join **4 of the 8 single-speaker workshops** (each 20 mins long). The format is intended to be conversational, informal and interactive. Join us upstairs!



Time/Room	Gorilla Room 1	Gorilla Room 3	Gorilla Room 4	Gorilla Room 5
	Chemistry-as-a-Service	Next-Gen Industry in Action Today	Circular Economy in Action Today	Bringing you Green Chemistry Today
11:00am-11:20am	DNCP	Finindus/ArcelorMittal	Indaver	Harsonic
<i>5 min transition</i>				
11:25am-11:45am	Derbigum	Exypnos	ISVAG	Oleon
<i>5 min transition</i>				
11:50am-12:10pm	DNCP	Finindus/ArcelorMittal	Indaver	Harsonic
<i>5 min transition</i>				
12:15pm-12:35pm	Derbigum	Exypnos	ISVAG	Oleon