

# Corporate Venturing and the Future of Energy



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**Jun Kit Mah** and **Bretia Coxon-Owens** also prepared research for this report during internships at Leif Capital. Jun is completing an MSc in Climate Change, Management & Finance at Imperial College Business School. Bretia is about to start her second year at Leeds University studying International History and Politics.

## Publishers



### Leif Capital

Leif sources strategic capital along its clients' value chains, thereby building win-win investment cases that marry the needs of startup entrepreneurs and large corporations. We are proud to have raised more than £100m for early/growth stage businesses. Leif Capital is the trading name of Carbon Communications International Ltd, which is authorised and regulated by the UK's Financial Conduct Authority.



### Global Corporate Venturing - Leadership Society

The GCV Leadership Society is for corporate venturing leaders and aims to be the pre-eminent provider of data, information, events and other services for the global corporate venturing community. The Society helps develop the corporate venturing leaders of the future.

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# Foreword

As well as capturing the most important corporate ventures deals and trends in energy over the last few months, this report serves as an excellent curtain-raiser for GCV's Asia Congress in Hong Kong in September and the Venture Houston conference in November.

Can we imagine an Asian city, Beijing perhaps, displacing Houston as the world's capital of energy corporate venture capital in the next decade or two? China's strategic appetite for energy solutions is certainly compelling. But to source the technology it needs, China's corporations are venturing globally, which brings them inevitably to Houston, thereby furthering the city's role as the leading crucible of energy innovation.

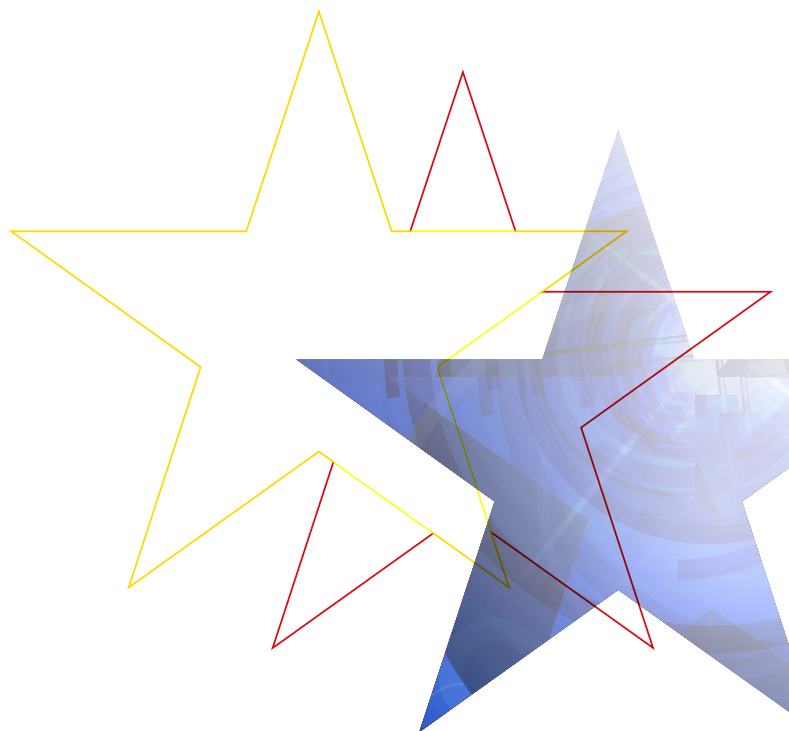
Reviewing the data and doing the interviews, we got a very strong sense that the energy industry is both vulnerable to disruption, but also open to the transformation that corporate VCs from all industries (not just energy) and all countries are backing.

We'd like to commend the reports' sponsors, Chevron Technology Ventures and BP Ventures, for their visionary roles in advancing energy and mobility. Chevron Technology Ventures' President Barbara Burger is the co-Chair of the Houston conference. BP Ventures' China Lead Jin Hu will chair a panel on advanced mobility in Hong Kong. Her colleagues will also be in Houston. They and their fellow members of GCV's Leadership Society will introduce companies from their venture portfolios that are advancing the transformation of energy and mobility.

**Tom Whitehouse,**  
CEO, **Leif Capital**, and Senior Advisor  
(Energy and Mobility), **Global Corporate Venturing**

**Kaloyan Andonov,**  
Reporter, **Global Corporate Venturing**

## Introduction



# The China- Houston- California energy venturing axis

The International Energy Agency's latest energy investment review reported that in 2017 China accounted for 55% of global investment in solar and that Asia accounted for a third of global investment in energy overall (hydrocarbons and renewables combined). Energy investment in non-OECD countries was 50 per cent greater than in the developed world. Asia in general, and China in particular, is becoming more dominant in the energy industry.

Tell us something we don't know, I hear you say. We'll try. One of the questions raised in this report is whether the energy-focused corporate venture capital (CVC) industry is also becoming more Asia-focused and Asia-dominant. We report also from Israel and ask whether the time is right for the 'Startup Nation' to turn its attention and renown entrepreneurial endeavour to energy. Ever present in our reporting of energy corporate venturing are the questions of how advanced mobility, particularly the growth of electric vehicles, is impacting energy, and how energy is being digitised. Inevitably, our answers are inconclusive, but we hope you find them interesting.

Certainly, Chinese corporates are increasing their venturing activities in energy, but they're venturing outside of China as well as inside China. And when they're doing deals outside of China, they are often co-investing with US and European financial and corporate VCs, who are busy expanding their venturing activities in Asia in general and in China in particular. The venture capital flows from east to west and back again, and vice versa. And the technology being commercialised by such venturing is being deployed globally. Energy remains the world's largest industry and despite the whiff of trade wars in the air, the best new technological solutions have near instant global

Continued ...



appeal. And thanks to their CVC backers, the solutions can get fast market access.

But the sums invested from Chinese CVCs both at home and abroad, and the number of deals done, remain modest relative to other industries such as e-commerce and fintech. (See 'Chinese energy venturing – tip of the iceberg?' from page 9 below).

So, the big question is: are we at the beginning of a substantial increase in China-inspired energy venturing? Is energy-tech back? For many of us, it's never gone away, but the evidence of recent deals suggests not only a growing interest from, and in, China, but the arrival of CVC 'unusual suspects', i.e. CVCs from industries that are not traditionally seen as energy-focused.

For example, the CVC backers of the Q2 energy deals summarised by my GCV colleague Kaloyan Andonov from page 23 below include Cisco, Dell and Legal & General. Accenture Ventures is one of the backers of digital energy leader innovator

Maana (see diagram 13 on page y below), whose other CVC backers include Accenture's fellow GCV Leadership Society members Chevron Technology Ventures, Intel Capital and GE. Chinese CVCs Sino Capital and CICC joined the Maana shareholder registry at the beginning of this year.

From page 17 below Barbara Burger, President of Chevron Technology Ventures, says that such diversity among co-investors is set to increase.

*"There are two reasons; more and more corporations and other businesses are starting venture capital arms (as well as venture investments coming from family offices and other investors)," she says. "And some of our investments – particularly in the digital realm - cut across industry verticals and thus attract a wide range of interested investors."*

Barbara also sets out the strategy of Chevron's Future Energy Fund, which she says, will make *"investments in technologies that may breakthrough or disrupt the energy vertical in the future."*



*"We've monitored the cost curves, the scaling opportunities and the impact of policies ... now is the right time to build on our participation,"* says Barbara.



Corporate VC enthusiasm for energy contrasts with the prevalent scepticism among financial VCs. Energy-focused VC funds performed relatively poorly in the last decade. The capital intensity of energy technology and the time required for commercialisation were greatly underestimated. CVCs, with their relative patience and deep pockets, sense an opportunity in this financial venture capital vacuum. Nowhere is this more relevant than China, with its booming technological landscape, increase in global energy consumption, and proliferation of startups. What adds to the appeal of energy venturing in China is the support of its government.



*"The Chinese government is very supportive of innovation, particularly in our priority areas, low carbon energy and advanced mobility,"* says Jin Hu, Investment manager and China Lead at BP Ventures.



*"In my opinion, China is also the best market to trial new technologies from anywhere in the world. Europe and the US are less open to disruption through rapid adoption and scale up,"* says Jin, before quickly adding the caveat *"Of course, I could be biased"*.



BP has announced an investment in NIO Capital, a China-based corporate venture capital company focused on advanced energy and mobility, and which was established by the leading Chinese EV company NIO. See page 11 and diagram y for more information on NIO.

From page 14 Jin sets out BP Ventures' ambitions in China and the strategic rationale behind its deal with NIO Capital.

Finally, from page 20 we report from GCV's first conference in Israel earlier this year, where energy was high on the agenda. Centrica Innovations, the venture wing of the eponymous energy company, which sponsored the conference, is focused on sourcing technology from Israel.

*"2013 was the beginning of the rapid growth of auto-tech venturing,"* says Jonathan Tudor, Centrica Technology and Strategy Director. *"Before 2013 auto-tech was about braking systems. Since then it's been about connectivity, electrification and autonomy. Today, it feels like there's something similar happening in energy as it begins to digitise. Look at the deal flow out of Israel and other innovation hot-spots."*

Look also at the venture-backed innovation in our diagram on page 12 which starts with BP Ventures' Q2 investment in StoreDot, the Israel-based charging technology business, whose investors also include the South Korean conglomerate Samsung and the German automotive giant Daimler, which in June this year invested in British navigation technology business What3Words, whose investors also include Intel Capital, a co-investor with BP in California-based autonomous vehicle technology business Peloton.

The purpose of our diagrams is to illustrate the growing trend for cross-industry and international CVC co-investment in global energy technology. It's what Global Corporate Venturing enjoys reporting most.

I hope you enjoy the report. Our next edition will be the 'Houston Special' published in October ahead of our 'Venture Houston' conference in November. High on the agenda there will be the following issues and questions: Digital energy as a venture proposition; How can early-stage businesses access the energy industry? The impact of blockchain on energy; How do agriculture, food and energy combine sustainably? Low carbon – this time it's different. Is it? Please join us.

**Tom Whitehouse**




# Venture Houston

November 8-9, 2018

## Discover the impact of digital, decarbonisation and decentralisation on the energy sector

Our second annual Houston conference, hosted by Global Corporate Venturing (GCV) and Global University Venturing (GUV), will see concurrent tracks debate the convergence of digital, decarbonisation and decentralisation on the energy sector by the main corporate venturing units and their portfolio companies while, in partnership with the National Council for Entrepreneurial Tech Transfer (NCET2), the main US and international universities will gather to develop best practices for their venturing and startup approaches in parallel through the GUV Leadership Society and its Powerlist 100.

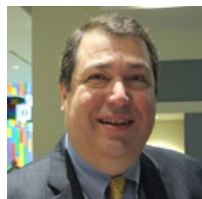
Last year's inaugural conclave championed the resilience of the Houston-based and broader Texan venture capital and innovation industries. It came on the day the Houston Astros won their first World Series, and the world will once again turn to the city for inspiration.



Speakers include:



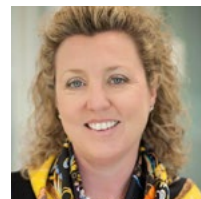
**Barbara Burger**  
Chevron Technology Ventures



**Tony Stanco**  
NCET2



**Mike Redding**  
Accenture



**Renee Ryan**  
J&J Innovation



**Hiren Majmudar**  
Intel Capital





# Chinese energy venturing

## Tip of the iceberg?

This article looks at the energy and autotech sectors in China and how Chinese VCs are acting within that space. It analyses the investment trends over the last three years and suggests key drivers that form the basis of those trends.

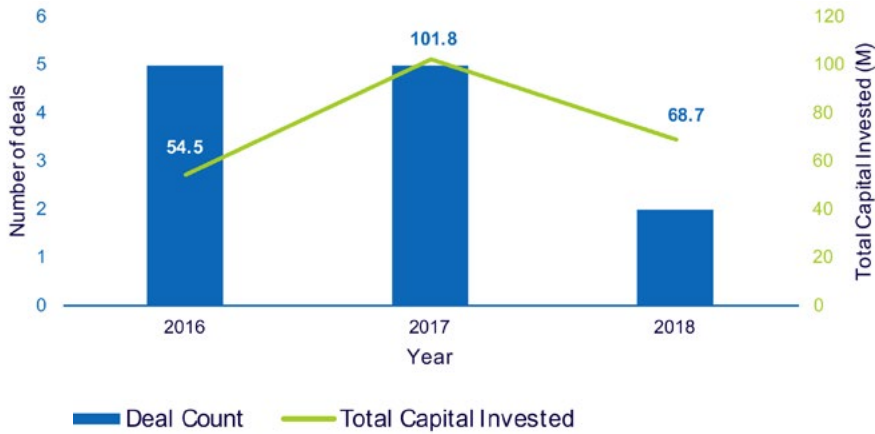
The first two graphs (next page) show total capital invested by Chinese CVCs in China in the energy and autotech sectors. Energy covers activities related to oil and gas, energy storage, energy software and analytics, and renewable energy. Autotech covers autonomous driving or assisted

driving, electric vehicles technologies including car battery storage, car security, navigation, sensors, and connectivity. Before commenting on the data, note that venturing activity in China is typically under-reported. No doubt, there are deals undisclosed.

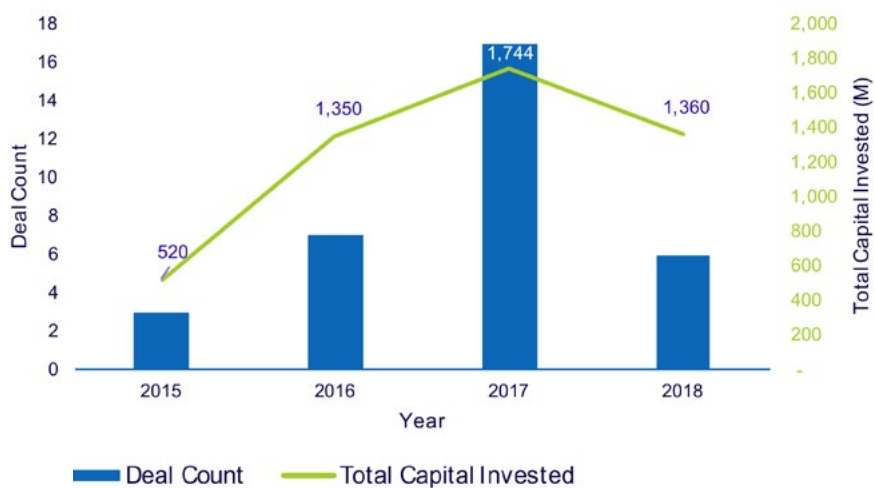
From the first graph, it seems that the number of deals done on an annual basis since 2016 is fairly consistent, with the number of deals done in 2018 looking on track to reach about five deals by the end of the year. Total capital invested is increasing

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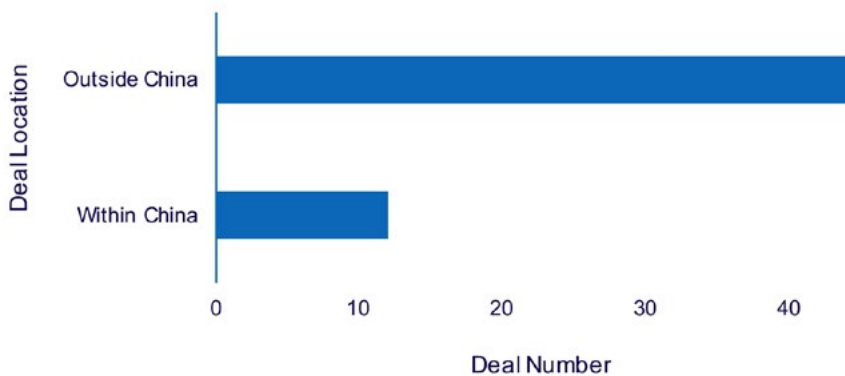
### Deal count and capital invested by local CVCs in China's energy sector



### Deal count and capital invested by local CVCs in China's autotech sector



### Reported investments made by Chinese VCs since 2016



year on year, suggesting that either deal sizes are becoming larger on average or that the companies that are raising capital are entering later rounds.

From the second graph, deal count has increased from 2015 to 2017, with 2018 looking set to match 2017 or perhaps slightly undershoot. Similar to the energy sector, total capital raised is also increasing year on year, but deal sizes may not be increasing since the number of deals done has also gone up.

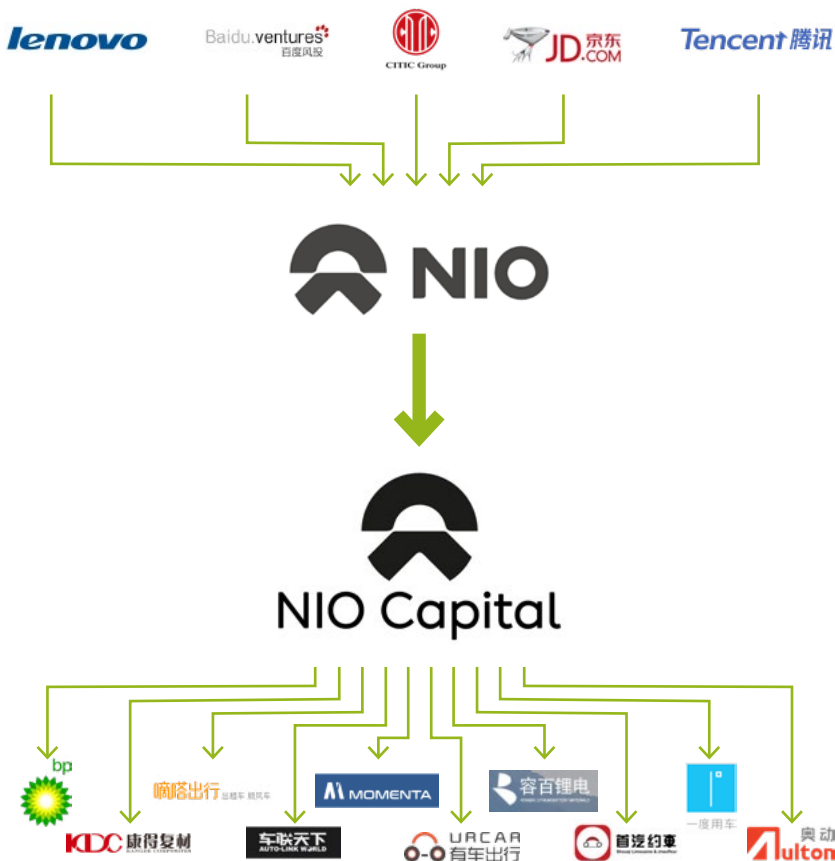
Zooming out, and reviewing the third graph, in the energy sector, there were a total of 12 deals reported covering Chinese firms investing within China as opposed to c.44 deals from Chinese firms doing overseas investments over the past three years.

One of two things is taking place, either i) Chinese firms prefer doing energy investments outside of China, which is rather unlikely given the political push for China's energy transition, or ii) There are Chinese deals that are not being captured. A similar pattern is seen if we took a higher-level look at autotech. Despite the caveats concerning the data above, it gives CVCs a good initial understanding of the energy and autotech deals done within and by Chinese CVCs in their own country.

Jun Kit Mah, *Leif Capital Analyst*

# From NIO to NIO Capital

CVC-backed mobility innovation begets a new Chinese CVC focused on mobility and energy



**NIO** is a developer of autonomous electric vehicles in China. Commonly referred to as Tesla’s competitor, it is trying to shape the future of mobility both inside and outside of China. **NIO** raised over \$2 billion from Series A to Series D and has filed for an IPO on the **New York Stock Exchange**. Notable CVCs that have backed **NIO** include **Tencent Holdings, Baidu Ventures, Lenovo Capital, Citic Group** and **JD.com**. Having been venture-backed itself, it launched its own venture unit in 2016 in the form of **NIO Capital** to invest in China’s new energy vehicle ecosystem.

Over the past year NIO Capital has invested in nine different startups which have different specialisations within the autotech industry. BP Ventures recently announced a \$10m investment in NIO Capital. As BP Ventures’ Jin Hu comments below: “There’s a good fit for us with NIO Capital.”

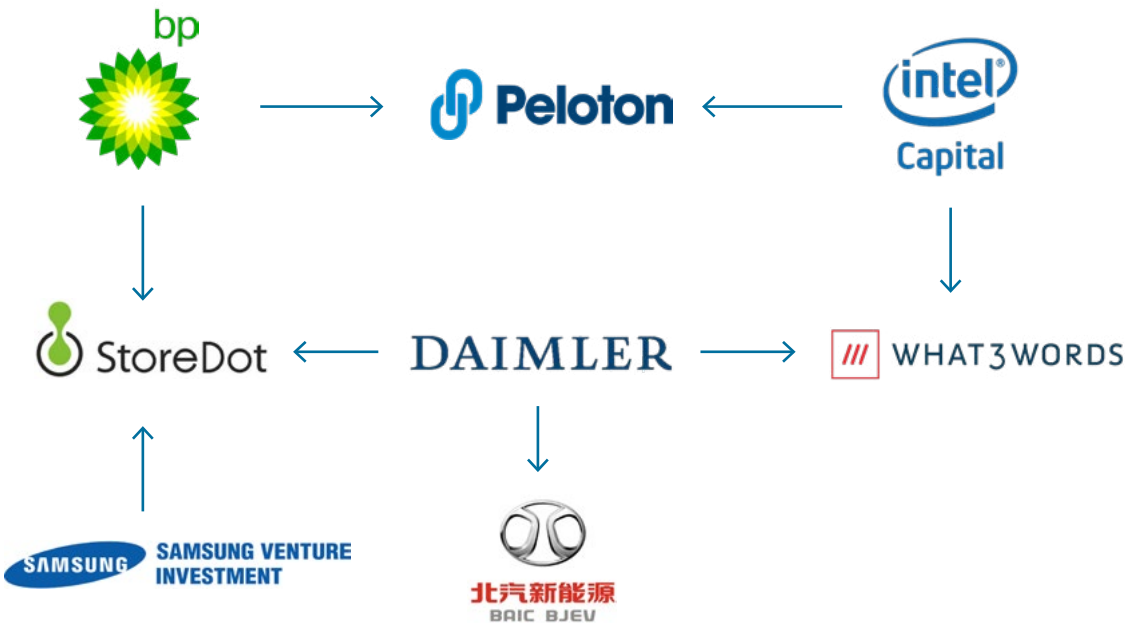
# CVC-backed energy and mobility innovation

## The Circle of CVC Storedot

**BP Ventures** invested in **StoreDot**, the Israel-based battery charging technology business, as a part of its efforts to become a global leader in advanced mobility. *“The technology can charge a mobile phone in five minutes,”* says BP Ventures MD **Akira Kirton**. *“We’ve invested alongside Daimler and Samsung [...] so that hopefully in two to three years we will have an electric car that is chargeable in five minutes.”* Having corporate VCs from both Asia and Europe, and with expertise in energy, automotive and mobile phones, will stand StoreDot in good stead as it

addresses various global markets that require superior battery performance.

Daimler, meanwhile, took a minority stake in the electric car subsidiary of BAIC, the Chinese state-owned automotive business. Daimler also invested in London-based navigation technology business What3Words, alongside Intel Capital, a co-investor with BP Ventures in the California-based autonomous truck business Peloton. And thus is the Circle of CVC.



## CVC-backed energy and mobility innovation



## CVC Co-Investment Maana

**Maana**, the California-based ‘knowledge platform’ and digital energy integrator counts several corporate VCs among its backers: **GE Ventures, Intel Capital, Chevron Technology Ventures, Saudi Aramco Energy Ventures, Shell Technology Ventures, Accenture Ventures, CICC, Eight Square Capital**, and **Sino Capital**. That’s quite a spread of industries (energy, software, consultancy) and geographies (US, Europe, Middle East, China), illustrating again the growing trend for cross-industry CVC co-investment and underlining the growing interest from Chinese CVCs in US-based energy technology.

**Mike Redding**, Managing Director, Strategic Technology Innovation at **Accenture** says Accenture ventures invested in Maana “to help us amplify our energy practice”.

“We really believe in human + machine,” says Mike. “That’s how we are going to unlock productivity. Maana is taking data, and AI analytics and helping an operator make a more effective and strategic decision time and time again, which is massively transformative. And energy is just ripe to adopt it.”

Speaking more broadly about Accenture’s interest in energy, Brian Richards, Managing Director of Accenture’s Houston Innovation Hub, says: “Our venturing strategy in energy is not specifically about changing the sources of energy. For example, we’re not investing in renewables. It’s about the application of digital expertise – in AI, mobility, block chain – to the energy industry. Energy is not the first industry to go digital and there’s a lot that we can apply from our experience of digitising other industries such as retail and financial.”



# Demonstrating value in China

BP Ventures' Jin Hu sets out a growth plan for advanced mobility and low carbon energy venturing



Jin Hu,  
BP Ventures

**Jin Hu, BP Ventures'** Shanghai-based China Lead, explains to **Tom Whitehouse** how she is 're-adapting' to her country of birth after 16 years in the UK. She sets out also the strategic rationale behind BP's backing of NIO Capital and pledges to demonstrate value to venture investors in China, which in her opinion is the "best market to trial new technologies."

## How does it feel going back to China after so long in the UK?

*I have been happily living in the London-centric 'global citizenship bubble' for the last 16 years. The UK is very international, and BP is very inclusive and diverse. China is of course no less global in its outlook, but it has a different feel and a very different tempo. For non-Chinese corporates to venture here, it requires adaptation to the local culture. And yes, even though I was born in China, I feel that I now have to adapt or perhaps 're-adapt'. I am walking this journey with a BP Ventures' hat on.*

## How? What is BP Ventures' approach to China?

*BP is of course known in the energy sector in China and enjoys a good reputation. So, it's not as if we have a standing start. Globally, BP Ventures has a reputation for creating strategic value as a corporate VC, but we need to demonstrate our value to China. This is true for any corporate VC operating in any part of the world, but I think it is particularly true in China because the local VCs are so active and it's so difficult for non-Chinese investors to get to the table to see the best deals. One of our first investments is in NIO Capital, a Chinese venture company that shares our focus on mobility and advanced energy transition. This is an important step for us.*

*We can also give Chinese businesses a platform to expand outside of China.*

Jin Hu

## What's the rationale for your investment in NIO Capital? And what strategic value do you bring?

*NIO Capital's roots are very interesting. First, there was NIO, a very successful Chinese car company that was backed by leading Chinese VCs. NIO's founder, William Li, had previously built a very successful*

Continued ...

The Second Annual



20 September 2018 | Hong Kong

# THE RISE OF DRAGON & TIGER TECH II



Come together in Hong Kong to see how Asia is developing the innovations of the future through corporate venture capital.

There are numerous examples of 'Dragon Tech' and 'Tiger Tech' - Shenzhen for drones, WeChat as a platform, Wanxiang for blockchain, Softbank for robots, Singapore as a smart city - and much to learn from the financing structures that enable them. But with growth and innovation capabilities come the potential for tensions.

### Who's Coming?

This event will create a bridge between the Pan-Asia corporate venturing community and with those from the global venture community. An estimated 200 delegates will be joining us, at this, the second GCV Asia Congress.



20 Day Deadline  
Save 11%  
Register by 31 August, 2018

Contact us for more information  
[tlafferty@globalcorporateventuring.com](mailto:tlafferty@globalcorporateventuring.com)

[www.gcvasia.com](http://www.gcvasia.com)

internet company, which he took to IPO in the US. So, he brings a fresh perspective to mobility. And now he has founded a venture firm, NIO Capital, which I believe extends this fresh approach to investing in startups. By the way, I'm not saying that the traditional OEMs have less to offer. They have plenty to offer, and we hope also to collaborate with them. Right now, there's a good fit for us with NIO Capital. It shares the same focus on the new energy vehicle ecosystem, including advanced mobility and smart energy. Their management team includes individuals with strong experience and background. We can be an effective partner to them. In addition to capital, we bring knowledge and experience of energy and advanced mobility from around the world. We can also give Chinese businesses a platform to expand outside of China.

### Are you looking at direct investment opportunities?

Of course. We are filling our pipeline and are working on a number of deals we expect to close soon. Our first investments are likely to be in early stage companies in the new energy value chain rather than in completely new ground-breaking technologies. We will also be supporting incubators, so we can get an early view on potential investments. This year, we sponsored the 2018 China Cleantech competition run by TusStar, one of the most well-known networks rooted in Tsinghua University, together with ADB bank. Besides its financial sponsorship, BP Ventures also brought a new set of exciting startups and Chinese VCs to the launch event. Overall, our venturing in China will be like the approach that BP has taken in other parts of the world, where we have developed relationships with great local venture and incubator partners, and where we make direct investments.

**Why is BP ventures now prioritising China? Some non-Chinese corporate VCs are already active there. Others have yet to arrive. Why is now the right time for BP?**

There is a lot of passion and energy in China and new firms can really turn the 'impossible' into the

possible, which I guess is what venturing is all about. Chinese consumers are very receptive to new ideas. Entrepreneurs can quickly test technologies and business models and move forward. And the Chinese government is very supportive of innovation, particularly in our priority areas, low carbon energy and advanced mobility. In my opinion, China is also the best market to trial new technologies from anywhere in the world. Europe and the US are less open to disruption through rapid adoption and scale up. Of course, I could be biased!

*“There is a lot of passion and energy in China and new firms can really turn the ‘impossible’ into the possible.”*

**China tends to divide opinions in the venturing world. Many are still wary. Why is this do you think?**

Opinions on China are changing. I heard some VCs describe how easy it is in China for entrepreneurs as it is a lot easier to access money, while others see it as a very difficult environment. The truth is that some VCs came here and didn't spend enough time learning and adjusting to the local culture and environment. BP is not going to make this mistake.

**What are the long-term plans? You're BP's first venture appointment in Shanghai. Will there be others?**

Yes, we will be growing the team, expanding our footprint in China, especially in Beijing and Shenzhen. We have to. I don't expect to find limitations in China. If we can't do enough deals it will be because of us, because we're not adaptable, agile and fast enough or because we can't make our value proposition relevant in this market.

**Tom Whitehouse**

*I don't expect to find limitations in China. If we can't do enough deals it will be because of us.*





# Barbara Burger, President of *Chevron Technology Ventures*, Looks to the future and sets a challenge for GCV in Houston

**In the interview below, Barbara Burger, one of the most senior women in the corporate venture capital industry, explains to Tom Whitehouse the strategy behind Chevron's Future Energy Fund. Though new, the fund's strategic rationale is the same, to add value to Chevron. She also urges Houston to build on its great legacy in innovation as it looks to advance new technologies, something we aim to do at GCV's Venture Houston conference in November.**



Barbara Burger  
Chevron

What's new about the new fund? How different will the investment strategy of the Future Energy Fund be from that of previous Chevron venture funds?

*"The investment focus for Future Energy Fund will be different than our earlier funds. It will be focused on technologies that enable emissions reduction in oil and gas operations as well as investments in technologies that may breakthrough or disrupt the energy vertical in the future. We have had investments in this space in the past but having a parallel fund in our organization brings specific focus to this area. We will, however, manage the fund using the practices we have developed over the nearly 20 years that we have had a corporate venture organization."*

What's not changing? I mean, is Chevron's commercial deployment of venture-backed technologies still the ultimate end game?

*"Our model is to add value to Chevron through being an on-ramp for promising innovators. We find, evaluate and integrate external startup technologies into Chevron. That won't change."*

Is Chevron, the parent company, setting new venturing priorities for you? In Europe, energy corporate VCs are increasingly being tasked with helping their parent companies grow their low carbon and electric mobility businesses. How does it differ for Chevron?

*"Our objectives for Future Energy Fund (which are stated above) are consistent with our corporate views on the expectations for our industry. We enable human progress by supplying safe, affordable, reliable and ever cleaner energy."*

Chevron Technology Ventures has been active for just about 20 years. Does that mean that

Continued ...



when you look at future energy technologies and business models, you find yourself saying that you've seen some of this before? I mean, is there a cyclical element to the 'future energy' investment theme?

*"We've watched this space for a long time and have played in some areas before. That experience makes us better informed today. We've monitored the cost curves, the scaling opportunities and the impact of policies. So, it's not about us joining a new cycle. We simply believe that now is the right time to build on our participation. And we've gotten smarter about what it takes to be successful in this area."*

How is Chevron's 'pool' of co-investors growing? In one of your portfolio businesses – Maana – you've co-invested with fellow energy CVCs, but also with Accenture Ventures and new Chinese CVCs. Is this a taste of the future?

*"We have had a track record of investing with a diverse set of players and we see that as continuing and growing. There are two reasons; more and more corporations and other businesses are starting venture capital arms (as well as venture investments coming from family offices and other investors) and some of our investments – particularly in the digital realm - cut*

*The Future Energy Fund [...] will be focused on technologies that enable emissions reduction in oil and gas operations as well as investments in technologies that may breakthrough or disrupt the energy vertical in the future.*

**Barbara Burger**

*across industry verticals and thus attract a wide range of interested investors."*

What's special about the Houstonian and broader Texan venture eco-system? How is Chevron helping support and grow the venturing and innovations there?

*"I'll speak to Houston as a city. We have developed a vision and comprehensive strategic plan for growing the innovation ecosystem. It is inclusive rather than being focused on venture-backed startups. It draws on collaboration between government, universities, startups, investors and corporations. We have a huge number of corporations with a presence in Houston that can provide a built-in customer base*

Continued ...



*for start ups, if we have the right relationships. That hasn't been always done in the past. There is still much that we have to do about it. We have been punching below our weight but there is momentum. And when Houston goes for it, great things happen.*

I know. I saw the Houston Astros win the World Series the day of GCV's first Houston conference. It was a great time to be in the City. Thanks for supporting the conference and for supporting our conference again this year as conference co-chair. What are your expectations? What should be our objectives and ambitions?

*We have had a track record of investing with a diverse set of players and we see that as continuing and growing.*

*"Thanks for coming back! We're happy to see you active in Houston. I don't think your activities should be confined to the west and east coasts. There is a lot happening here. The event should mimic the ecosystem and its inclusiveness. We should include all aspects of the energy vertical, by which I mean all sources, and from generation to use. We need diverse panels, from different parts of the ecosystem so that people from outside the corporations can see how they*

*can plug in. Fundamentally, we need to be forward looking. Houston has a great legacy; we put a man on the moon, we have a great history in oil and gas. But we now need to look forward to where the economy is going overall as well as in our strong sectors of energy, life sciences and space."*

You're one of the few women at the top of the CVC industry. What's your advice for corporate VCs seeking to employ more women? And what's your advice for women who want to work in energy venturing?

*"I think of myself as working in energy more than the corporate venture capital industry as I have had a long career in Chevron with the last five years as the President of our Technology Ventures Company. But my advice is no different. For companies, the best way to be inclusive is to be inclusive. When prospective or new employees look up, do they see people that look like them? Secondly, when they look up and they see people that look different, are those people welcoming? That is diversity and inclusion. We're working hard on this at Chevron in many dimensions and while we have made progress, we are not there yet. I view one of my most important responsibilities (and one of my most rewarding ones) as making progress in this area."*

**Tom Whitehouse**



# Switching Israel ON to energy



Jonathan Tudor  
Centrica

**For a country whose innovation track record is world-beating in so many industries – e.g. ag-tech, water-tech, auto-tech (particularly in connectivity, cyber-security, and computer vision) – the Startup Nation’s contribution to solving energy problems is surprisingly weak.**

Why is this? And is it about to change? These were the two main questions discussed on a non-attributable basis by leading Tel Aviv-based and Israel-focused corporate VCs at a GCV dinner the evening before our first conference in Israel. The answers are illuminating and suggest that Israel may be about to do for energy what it has been doing over the last five years for automotive – connect, digitize, autonomise and secure.

*“Historically, the fundamental driver for Israeli innovation was survival, not doing good. We could easily import fuel for energy. Coal, oil and gas are highly commoditised markets. But water and food had to be produced at home,”* said one of the corporate VCs. Like food and water, security too (and the technological means to provide it) could not be imported. Thus, home-based innovation flourished in these areas.

*“Sure, Israel missed an opportunity in energy. We could have taken a lead. For example, we were early pioneers in solar thermal power.\* But there were other, more pressing priorities,”* said another.

This may be about to change. Twenty years ago, disruption of the energy industry was primarily an ethical calling; the domain of renewable technology pioneers and their ethical investor backers. Ten years ago, the roll-out of now proven renewable energy technologies such as solar and wind became an infrastructure investment opportunity, one which is still attractive, particularly in parts of the developing world, which lack energy, but which have plenty of sun and wind (e.g. India). But in the developed world, the energy investment opportunity is changing. The growth of renewables and electric vehicles are obliging inflexible ‘dumb’ centralised power systems to become flexible, responsive, digital, local and smart.

Better call Israel. **Jonathan Tudor**, Technology and Strategy Director of **Centrica Innovations**, already has.

*“We’re looking to invest \$140m in the very best ideas and businesses and believe that Israel offers access to both great tech and some of the world’s greatest*

Continued ...

\* Solar heaters were first installed in Israel when the country experienced a fuel supply crisis in the early 1950s. The government responded by severely restricting the times when water could be heated. Israelis in turn responded by purchasing huge quantities of solar water heaters. By 1983, 60% of the population heated their water with the sun. A law was eventually passed requiring the installation of solar water heater.

entrepreneurs and innovators,” said Tudor, who switched to Centrica, the UK and US-based energy and services provider, from BP Ventures last year. (Disclosure: Centrica sponsored GCV’s Israel conference.)

“We’re particularly interested in the distribution of energy, electrification of transport and increasing connectivity through data, blockchain and the Internet of Things,” added Tudor.

Centrica’s readiness to make venture capital investments in Israel follows a successful acquisition three years ago. “Having acquired Panoramic Power, a leader in circuit level energy management solutions in 2015, we see Israel as an excellent candidate for investment,” he said. (See separate side bar).

Can Israel deliver on energy? Its track record in automotive, an industry facing similar challenges to energy, is encouraging.

“Only when the car became a connected device did corporate VCs come to Israel to commission technology solutions,” said one of our corporate VCs over dinner. “Israel’s engineering expertise in security was easily transferable to the challenges of connectivity, cyber-security and computer vision faced by the automotive industry.” Likewise, the challenges of digitisation, flexibility and responsiveness, should be right up Israel’s street. Indeed, a fresh



perspective on energy may unlock problems that traditional energy has yet to solve.

In the opinion of one of our corporate VC diners, a US-based investor: “We all know that content is king. But energy can’t really be differentiated - electrons are just electrons. Ultimately, disruptive innovation in energy may therefore have to go ‘over the top’. No one wants a ‘down the pipe’ solution.”

Asked for examples of what an ‘over the top’ solution would look like he spoke of the possibility of free energy in return for data, data which could be monetised, or energy services which could be bundled with other higher value services such as televised sport. Meanwhile, the Israeli-based CVCs were more cautious. The conversations switched to ‘old school’ hydrocarbons, the promise of Israeli off-shore gas which may reduce, but not eliminate, Israel’s dependence on imported coal as its source of base-load power.

All of a sudden, we’d gone from the high-tech prospect of digital energy to the very old-tech world of coal, which has powered Israel’s economy since its foundation. As the coffees arrived, it was a sobering thought.

Continued ...

*“We’re particularly interested in the distribution of energy, electrification of transport and increasing connectivity through data, blockchain and the Internet of Things.”*

Jonathan Tudor

*“2013 was the beginning of the rapid growth of auto-tech venturing. Before 2013 auto-tech was about braking systems. Since then it’s been about connectivity, electrification and autonomy. Today, it feels like there’s something similar happening in energy as it begins to digitise.”*



## Israeli energy innovators – outliers or a taste of the future?

### 1. Panoramic Power

Before being acquired by Centrica in 2015 for \$63.86m, Panoramic’s corporate VC investors included Qualcomm Ventures. Based in Kfar Saba, but now integrated into Centrica’s global operations, Panoramic’s technology consists of wireless and self-powered circuit-level technology that can be retrofitted to provide owners and operators of energy assets with insights into energy usage and the potential to reduce costs.

### 2. APG Aero Systems

APB designs and manufactures solar-powered drones and provides broadcasting and internet communications. The Netanya, Israel-based business raised €3m from private investors in January of this year.

The overall impression left by GCV’s Israel conference is of deals being done and pipelines (in deals, not oil) being filled. There was a relaxed buzz in the room among entrepreneurs looking for corporate venture capital (some, but by no means all, focused on energy). The extent to which Israel gets switched on for energy-tech will be a function of energy’s need for what Israel is good at – connectivity, security, digitisation etc.

Jonathan Tudor is optimistic. *“2013 was the beginning of the rapid growth of auto-tech venturing. Before 2013 auto-tech was about braking systems. Since then it’s been about connectivity, electrification and autonomy. Today, it feels like there’s something similar happening in energy as it begins to digitise. Look at the deal flow out of Israel and other innovation hot-spots. Feel the buzz.”*

**Tom Whitehouse**



# Oil & Gas

## Venturing in the second quarter of 2018

Investments by oil and gas corporates had by the end of Q2 already reached the half-year level, at 21 rounds, of 2017, when there were 40 rounds in total. This indicates that overall activity by the end of this year is likely to remain similar to last year's.

The average size of deals in which oil and gas corporate venturers participated through the second quarter of 2018 was \$37.75m, considerably higher than 2017's \$24.14m.

In terms of general investment strategies, many oil and gas corporate venturers focus on investing for a future dominated by renewable and sustainable energy as well as in mobility and transport. The latter space of interest encompasses not only automotive but also air and other types of transport.

France-based oil and gas company Total led in number of cleantech investments along with

Anglo-Dutch company Royal Dutch Shell. UK-based BP and Norway-based Statoil have also been active in that space, though their portfolios are somewhat more diversified. Statoil has placed bets on the cleantech space, but more so on oil and gas core operation technologies. US-based Chevron has made direct commitments mostly to core energy operations and IT, much like its peer Saudi Aramco. However, with its most recent \$100m fund, discussed further below, Chevron will also be placing more bets on green and renewable technologies.

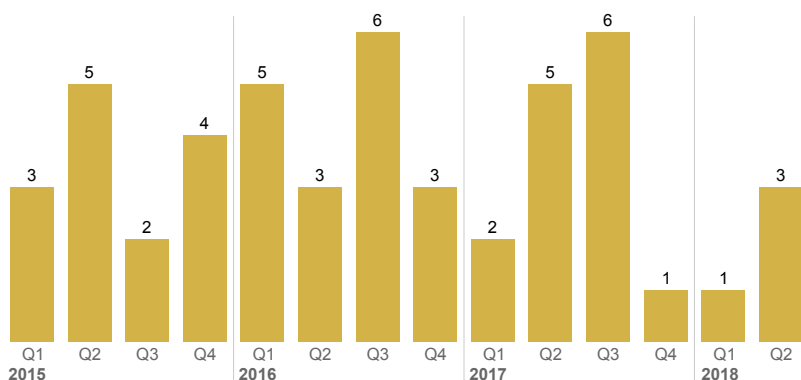
### Deals

Oil and gas companies among the top corporate venture investors from the industrial and energy sectors were BP, Total, Saudi Aramco and China-based oil exploration and production company Geo-Jade Petroleum. In the second quarter, there were a number of notable deals involving oil and gas corporate venturers.

China-based fintech platform Caogen Touzi (CGTZ) secured RMB2.3bn (\$359m) in series D funding from a consortium led by Geo-Jade Petroleum. Geo-Jade participated through an

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### CVC-backed deals in O&G enterprises



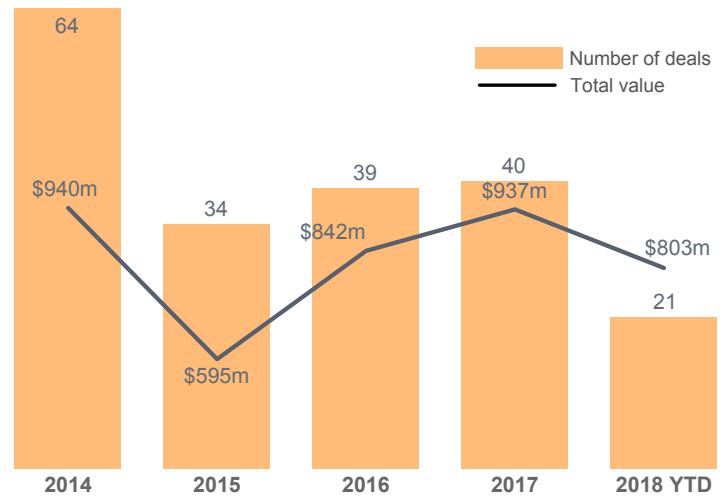
unnamed industrial fund and was joined by a range of unnamed existing shareholders. Founded in 2013, CGTZ has developed a range of investment tools for private users and small and medium-sized enterprises. Users can also apply for collateral loans backed by assets such as property and vehicles.

Germany-based energy storage system developer Sonnen completed a €60m (\$70m) financing round led by Shell Ventures, corporate venture capital arm of Shell. The other participants in the round were not revealed. Formerly known as Sonnenbatterie, Sonnen has created a home energy storage and management system designed to work in tandem with solar panels. It also runs a community scheme where owners of its systems can share their surplus solar energy. Sonnen is pursuing a cooperation agreement with Shell's new energies unit that will cover integrated energy, electric vehicle charging and grid services based on Sonnen's virtual battery technology.

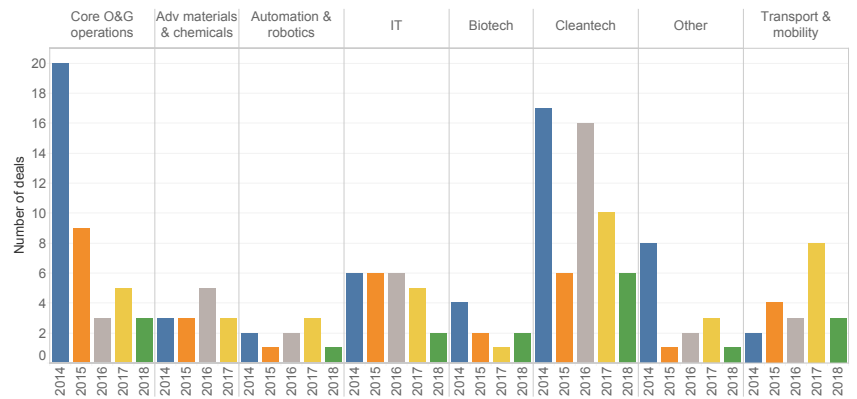
Parsable, a US-based creator of a software platform that connects workers, closed a \$40m series C round that included Saudi Aramco and aerospace manufacturer Airbus. Australian sovereign wealth fund Future Fund led the round, which also featured B37 Ventures, a venture capital firm backed by some 60 corporate partners, among others. Formerly known as Wearable Intelligence, Parsable provides software that helps employees of its industrial clients collaborate on tasks, receive instructions and provide feedback.

US-based memory storage developer Nantero raised \$29.7m from investors including oilfield services company Schlumberger. Computer manufacturer Dell's corporate venturing arm Dell Technologies Capital also participated, as did Cisco Investments – the corporate VC unit of networking equipment maker Cisco – and memory storage producer Kingston Technology, as well as three undisclosed semiconductor companies. Semiconductor-focused investment firm CFT Capital also contributed to the round. Nantero is developing storage technology known as high-density high-speed non-volatile random

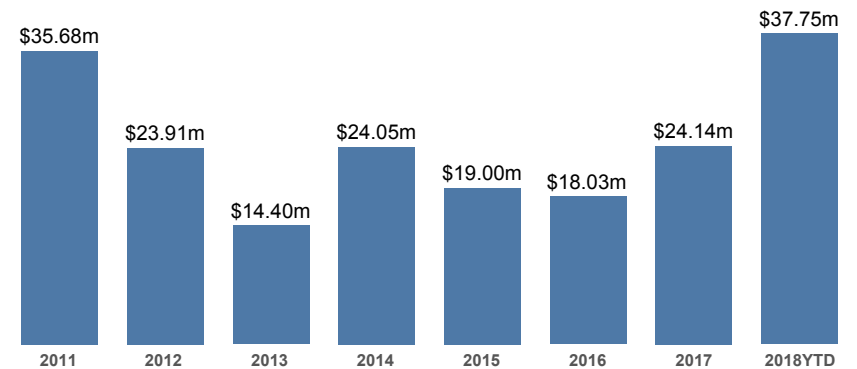
### Investment activity of oil & gas corporate investors 2014-18



### Type of oil & gas corporate venturing investments by year



### Average size of deals backed by oil & gas CVCs 2011-18



access storage using carbon nanotubes. The technology has applications in desktop, mobile, enterprise and internet-of-things systems.

UK-based solar cell technology developer Oxford Photovoltaics (PV) received £8m (\$11.2m) from its existing investors, including subsidiaries of Statoil and financial services firm Legal & General, which participated through its corporate venturing arm, Legal & General Capital, while Statoil invested

Continued ...



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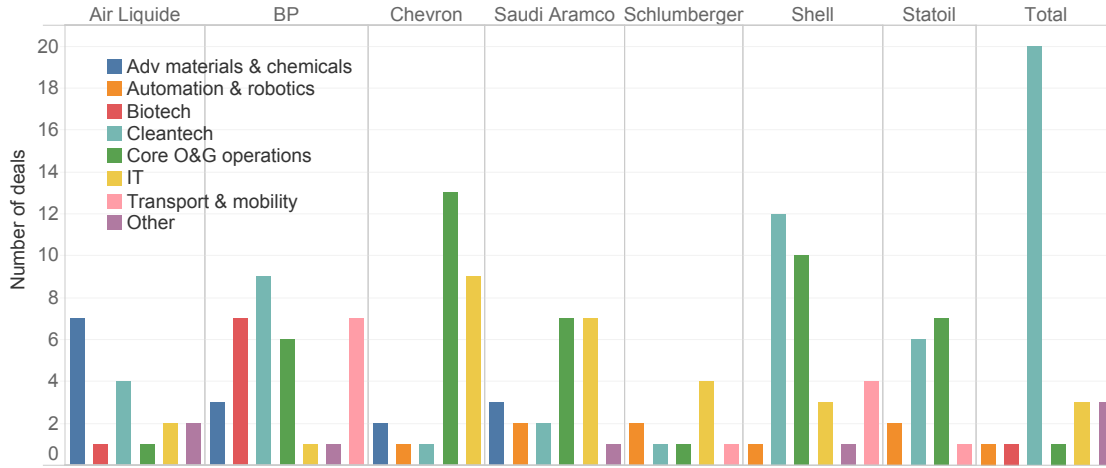
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### Type of investment by company 2014-Q2 2018



through its Statoil Energy Ventures unit. Spun out of University of Oxford in 2010, Oxford PV is manufacturing conductive films that can be printed on to conventional silicon solar panels to help them generate electricity. The films are made from a mineral called perovskite, which absorbs more solar energy than materials commonly used today.

Openbay, a US-based online marketplace for automotive repairs and services, raised \$8m in a series A round led by Shell Ventures. The round also featured venture capital firm Stage 1 Ventures, which took part as an existing backer, according to the company, as well as an unnamed strategic investor. Openbay has created an online marketplace that enables consumers to connect with automotive service providers, compare prices and service details, and book work.

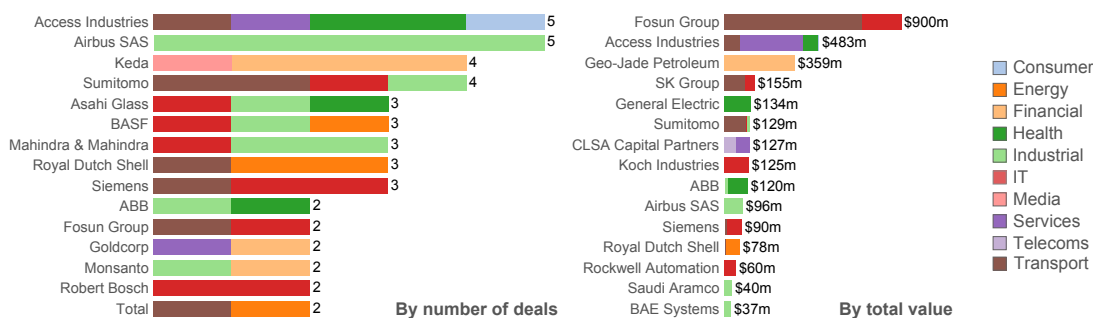
US-based refrigeration technology developer Axiom Energy raised \$7.6m in a series A round co-led by Shell and energy utility Great Plains Energy. The corporates participated through respective

subsidiaries Shell Ventures and GXP Investments, which were joined by WorldQuant Ventures, SV Tech Ventures and Meson Capital. Axiom Energy has developed technology that cools fridges in supermarkets and cold storage facilities at a reduced cost. Its “refrigeration battery” works by freezing tanks of saltwater at night, when electricity costs are lower, and discharging the cold air throughout the day.

Baania, a Thailand-based developer of data and analytics technology for the real estate sector, secured an undisclosed sum from investors including oil and gas producer PTT Public Company as well as Krungsri Finnovate and AddVentures, respective subsidiaries of financial services firm Krungsri and conglomerate SCG. 500 TukTuks also invested in the round, which will fund product development, and Krungsri has formed a strategic partnership with Baania in conjunction with its investment.

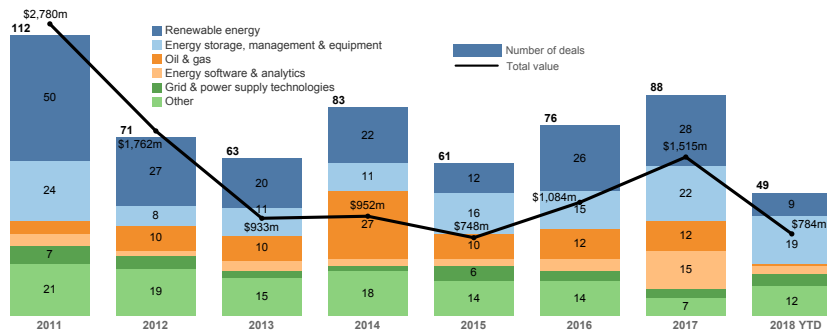
Silicon Microgravity, a UK oil and gas surveillance provider based partly on University of Cambridge

### Top energy and industrial investors Q2 2018



Continued ...

### Energy sector deals by subsector 2011-18



research, received \$7m in a round featuring BP Ventures, BP’s corporate venturing arm. The round also featured tech transfer office Cambridge Enterprise, commercialisation firm IP Group and fund manager Parkwalk Advisors. Silicon Microgravity is developing highly-sensitive microelectromechanical sensors that enable more accurate monitoring, appraisal and production from oil and gas installations.

Total invested an undisclosed sum in US-based solid-state battery developer Ionic Materials. The deal comes two months after Ionic raised \$65m in series C funding from lithium-ion battery producer A123 Systems, Alliance Ventures, which is backed by carmakers Renault, Nissan and Mitsubishi, and private investor and existing backer Bill Joy. Ionic has created a polymer it claims is the first solid electrolyte that is compatible with lithium and alkaline-based batteries while being capable of functioning at room temperature.

GCV Analytics also tracked deals by other companies related to the oil and gas industry or previously backed by oil and gas corporate venturers.

US-based cybersecurity technology developer Claroty obtained \$60m in a series B round featuring industrial automation company Rockwell Automation and Next47, the investment arm of consumer goods company Siemens. Singaporean state-owned investment firm Temasek led the round, among other investors. Founded in 2014, Claroty has developed a cybersecurity platform to access and monitor industrial networks remotely in sectors such as utilities, oil and gas, mining, real estate, and food and beverage.

Onapsis, a US-based cybersecurity technology producer that counts Schlumberger as an investor, secured \$31m in a series C round led by private equity firm LLR Partners. Growth equity firm Evolution Equity Partners and venture capital firms. 406 Ventures and Arsenal Venture Partners also participated in the round, which the company said boosted its overall funding to \$62m. Onapsis has built a context-aware cybersecurity product that automatically monitors and guards applications on platforms for software producer SAP and cloud software provider Oracle.

US-based manufacturing technology provider Arevo closed a \$12.5m series B round led by glass manufacturer Asahi Glass. Sumitomo Corporation of Americas, a subsidiary of diversified conglomerate Sumitomo, also participated in the round, as did investment firms Leslie Ventures and Khosla Ventures. Arevo has created a system that combines advanced composite materials, specialised software

### Top deals backed by oil & gas corporate venturers Q2 2018

	Round	Sector	Size	Venture investors
Caogen Touzi	D	Financial services	\$359m	Geo-Jade Petroleum   undisclosed investors
Sonnen	–	Energy	\$70m	Royal Dutch Shell   undisclosed investors
Parsable	C	Industrial	\$40m	Airbus SAS   B37 Ventures   Future Fund   Lightspeed Venture Partners   Saudi Aramco
OnTruck	B	Transport	\$29m	All Iron Ventures   Atomico   Cathay Capital   GP Bullhound   Idinvest Partners   Point 9 Capital   Samaipata Ventures   Total
Nantero	E and beyond	IT	\$21m	Cisco Systems   Dell   Kingston Technology   Schlumberger   undisclosed investors
StoreDot	–	Industrial	\$20m	BP
Oxford Photovoltaics	–	Energy	\$11m	Legal & General   Statoil
OpenBay	A	Transport	\$8m	Royal Dutch Shell   Stage 1 Ventures   undisclosed investors
Silicon Microgravity	–	Energy	\$7m	BP   Cambridge Enterprise   IP Group   Parkwalk Advisors
Ecovia Renewables	Seed	Energy	\$1m	Air Liquide
High-Yield Energy Technologies	–	Energy	–	Anglo American   Royal Dutch Shell
Ionic Materials	–	Energy	–	Total
Baania	–	Services	–	500 Tuk Tuks   AddVentures   Krungsri Finnovate   PTT Public Company

Continued ...

and free-motion robotics to facilitate the 3D manufacturing of strong lightweight components for industries such as aerospace, transport, electronics, pharmaceuticals, oil and gas.

Geli, a US-based energy storage management software provider that counts Shell as a backer, has received \$5.5m in funding. The company is reportedly targeting a final close of \$8m for the round, though it did not reveal any of the round's participants. Founded in 2010 and also known as Growing Energy Labs, Geli has built an end-to-end software platform that oversees the design, deployment and management of energy storage systems.

## Funds

Chevron Technology Ventures (CTV), the strategic investment arm of Chevron, launched the \$100m Future Energy Fund to back energy transition technology. CTV targets developers of technologies such as emerging materials, power systems, water management, IT, and oil and gas production. The new fund will concentrate on energy generation technologies that generate lower carbon emissions or can reduce emissions from oil and gas production. Barbara Burger, president of Chevron Technology Ventures, said: "Chevron has long put its financial strength to work at critical moments that shape the future of energy. The Future Energy Fund will inform our continuously evolving perspective on the energy landscape through investment in research and innovation. To prepare for the future, the work starts now."

Petronas Chemicals, the chemical production division of Malaysia-based oil and gas supplier Petronas, reportedly plans to leverage corporate venture capital to uncover opportunities for business growth. An investment team has been recruited to help Petronas Chemicals identify emerging technologies and markets that could be accessed through strategic investments, as part of a plan that will include mergers and acquisitions and in-house research. Arif Mahmood, vice-president for corporate strategic planning at Petronas, said: "We have a team now to look

at where we want to invest further, in terms of growing the portfolio of the business."

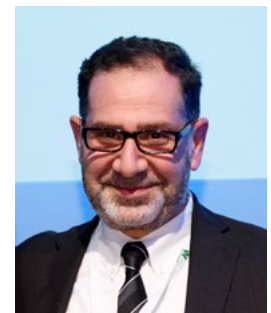
BP formed a long-term partnership with NIO Capital, an investment firm co-founded by China-based smart electric vehicle developer NIO, which will target mobility technology. The companies expect to invest in electric vehicles, advanced batteries, connected cars, energy infrastructure and other technologies of mutual interest, both in China and internationally. The agreement forms part of a strategy already pursued by BP through BP Ventures, whose portfolio includes startups developing low-carbon technologies, and through its product and service-led arm, BP Downstream. NIO Capital's agreement with BP appears to be unrelated to its \$500m fund, which was launched in November 2017 to invest in the automotive sector.

## People

Oil major BP's former head of corporate venturing, Issam Dairanieh, became an operating partner at Ascent Capital Holdings, a firm recapitalising a sustainability-focused portfolio, after two years as CEO of Global CO2 Initiative. Issam Dairanieh was previously head of BP Ventures.

Imran Kizilbash left his position as vice-president and treasurer at Schlumberger. Kizilbash declined to give details on his future plans. One of Kizilbash's former colleagues said he would remain close to Schlumberger Technology Investments (STI) after his departure. As vice-president of STI, Kizilbash spoke at last year's GCV Symposium about the increased capital and investment mandate of the corporate venturing unit, which is led by Iain Cooper, with Andrea Course and Tyler Durham as venture principals. STI had expanded into categories like renewables, software and the internet of things under Kizilbash's leadership and its function essentially comes down to "being ready to transform if and when required".

## Kaloyan Andonov



Issam Dairanieh  
Ascent Capital Holdings



Imran Kizilbash  
Schlumberger Limited

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