TECHNOLOGY DRIVING INNOVATION, OPPORTUNITY AND TRANSFORMATION

Technological megatrends are transforming businesses, markets and entire economies

At the 2014 Goldman Sachs *Builders + Innovators Summit* (B+I) honoring the 100 most intriguing entrepreneurs in the U.S., we brought together emerging business leaders and seasoned innovators to exchange ideas, insights and strategies. While the range of topics discussed were as compelling as the entrepreneurs themselves, the overarching theme emerging from the plenary sessions and informal conversations was that businesses across all industries must think of themselves as technology companies.

At B+I, each session returned to this central question concerning the role technology will play in shaping the business models and markets of tomorrow. We heard from athletic apparel executives on how wearables — devices worn on the body that measure physical activity — will reinvent their space; from healthcare innovators on the potential to connect tiny, ingestible sensors with users' smartphones to track physiological data; and from medical entrepreneurs, outlining a new doctor-patient paradigm, with on-call medical experts and online behavioral therapies to enable people to more readily take charge of their own well-being and achieve healthier lifestyles.

In short, technological megatrends are transforming businesses, markets and entire economies. 2014 saw the advancement of innovations that continue to shape our lives, such as cloud technology, increasing accessibility of powerful computing; seamless mobile and the Internet of Things (IoT), connecting billions of people through personal devices; 3-D printing, recasting the way we think about design and production; and machine learning, bringing forth technology that is more intelligent and driving a wave of industrial automation and potentially disruptive applications.

Further, we see fundamental changes across the industrial landscape, as connected and intelligent machines continue to make processes more efficient, flexible and productive. Likened to a new industrial revolution, the transformation brought forth by technology is creating both enormous opportunities and structural challenges. In addition to the potential impacts on human capital, incumbents across traditional sectors face increasing competition as technology and tech companies enter their space and alter their competitive landscape. For example, when utility companies invest in smart grid software rather than buying transformers; when customers demand a central hub to control their lights, HVAC and entrance to their houses; and when automotive manufacturers simulate and measure the impact of design on performance, we see technology-driven disruptions that are requiring the currently more established manufacturers to adapt.

In this way, the small-run possibilities of 3-D printing are providing the potential for increased customization and geographical dispersion of manufacturing. As much as we have seen the emergence of "Software as a Service" (SaaS) alter the competitive landscape, a similar and likely outcome will be the rise of "Manufacturing as a Service" (MaaS), whereby designers send layouts for output to local 3-D printers — or even directly to the customer for production on-site.

In the wake of such monumental change, Goldman Sachs is working with clients around the world as they contend with the direct and knock-on effects of the technology revolution. This means helping smaller innovative businesses as well as entrepreneurs capitalize on reduced costs of entry to compete, grow — and sometimes grapple with hyper-growth — as they look to become leaders in their industries. This also means helping established companies leverage, develop and/or acquire technology that will allow them to pursue new markets, models and pathways to growth.

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At the same time, our role at the center of the global capital markets requires us to continually work toward staying at the technological forefront — whether that be in how we assess investment opportunities, raise capital or manage risks.

One of our most important technological initiatives in 2014 was the creation of a Goldman Sachs-designed messaging platform for financial companies, enabling market participants to communicate instantly, securely and compliantly. This platform, called Symphony, was an outgrowth of our core business and our efforts to meet the changing needs of our own people and the clients we serve. Our focus on developing an advanced technology solution to meet a complex financial services need reflects our own mindset as a "technology company" and demonstrates the evolution of our industry as a whole.

The pervasiveness and permeating impact of innovation is, like never before, a reality that is pushing companies across all industries to think and act like disruptors in their own spaces. And in those few sectors that have yet to realize the transformative effects of technology, rest assured that the innovators are coming. Ready or not, technology is ubiquitous. ■

Our Work with Clients

Goldman Sachs team members supporting the transaction: Brittany Skoda, Lauren Blake, Emily Baker, Andy Fisher, George Lee, Investment Banking Division, San Francisco

Zendesk IPO

In May 2014, Goldman Sachs served as lead left bookrunner on Zendesk, Inc.'s $115 million IPO. Zendesk is a leading global customer service software platform based in San Francisco. Investors were attracted to Zendesk's growth potential, given its strong position among small- and medium-sized business customers and increasing traction with enterprise customers. In an environment where expectations for the quality and immediacy of customer service are growing, investors were impressed by Zendesk's opportunity to help its customers meet these rising expectations and by the company's reputation for creating well-designed, easy-to-use software.

Goldman Sachs team members supporting the transaction: Gabriella Skirnick, Barry O'Brien, Abraham Spitz, Max Justicz, Investment Banking Division, New York

Aeroflex Sale to Cobham

Announced in May and completed in September 2014, Goldman Sachs served as lead financial advisor to U.S.-based Aeroflex Holding Corp. in its $1.5 billion sale to Cobham plc, headquartered in the U.K. Aeroflex, whose lead investors included affiliates of Veritas Capital, focuses on specialized systems, including microelectronics products and test and measurement equipment for the aerospace, defense, energy, civil aviation and electronics industries. For Cobham, the acquisition diversifies the company's revenue mix and unlocks opportunities across the test and measurement space. Among other gains, Cobham has bolstered its position in commercial markets through its acquisition of Aeroflex.

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THE NEW ENERGY LANDSCAPE

Our energy future is dependent upon a dynamic and multidimensional energy strategy, a collaborative approach and a commitment to achieving a cleaner and more efficient energy footprint

Less than a decade ago, the global energy forecast seemed bleak. Global demand quickly outpaced new sources of supply, driving oil's march toward an unprecedented high of $145 per barrel. Rising prices put downward pressure on global economic growth, and many countries, including the U.S., were largely dependent on foreign supplies. In 2006, the U.S. — the world's largest consumer — imported 56 percent of its total oil consumption. Fear of geopolitical events impacting access to energy increased, along with concerns that inevitable conflicts over control of dwindling energy resources would put additional upward pressure on oil prices.

Today, the energy landscape is dramatically different, giving rise to what Goldman Sachs Global Investment Research (GIR) calls "The New Oil Order." This emerging paradigm reflects three major trends:

First, in North America, a decade of investment in shale technologies has resulted in soaring oil and gas production. Second, clean energy sources — particularly solar — are reaching critical mass. And third, improvements in energy efficiency are having an increasing impact on the way we live. With these in mind, we see more opportunities to create a cleaner and more efficient energy footprint that is good for both the environment and the economy over the long term.

We believe the key to a more stable economic and environmental future is a set of well-defined energy best practices and policies.

According to GIR, the investment in shale has had a particularly profound impact on prices and supply. In a few short years, the United States has become the largest producer of natural gas in the world and, more recently, one of the largest producers of crude oil. By 2014, oil production reached 12 million barrels per day, nearly a 70 percent jump over 2008, surpassing that of every OPEC country, including Saudi Arabia. Such increases in U.S. production have put downward pressure on global energy markets, and lower costs have boosted the economies of importing countries.

While many other regions have substantial — and in some cases larger — shale reserves, North America benefits from having all the pieces in place to leverage its reserves. These include innovative companies equipped with a skilled workforce, readily available investment capital, and more developed policy and infrastructure to help catalyze activity. Fully capitalizing on the shale revolution, however, will require long-term, demand-side investments, cleaner, more efficient

Our Work with Clients

Goldman Sachs team members supporting the transaction: Charles Park, Dinesh Ramasamy, Jeremy Hofmann, Brian Bolster, Sam Romer, Lynsey Wenger, Maxime Kennel, David Dubner, Investment Banking Division, New York

NextEra Energy Partners IPO

In June 2014, Goldman Sachs served as bookrunner and structuring agent for clean energy producer NextEra Energy, Inc.'s $467 million subsidiary IPO of NextEra Energy Partners, LP. This innovative transaction matched institutional investors' demand for shares of companies that offer both current yield and predictable growth with NextEra Energy, Inc.'s need for a new source of capital to cost effectively fund its expansion. NextEra Energy, Inc. has approximately 44,900 megawatts of generating capacity in the U.S. and Canada, and is regarded as the world's largest generator of renewable energy from the wind and sun.

Athlon Sale to Encana

Announced in September and completed in November 2014, Goldman Sachs advised Athlon Energy Inc., an exploration and production company focused on the development of unconventional resources, in its $7.1 billion sale to Encana Corporation. The prime asset consists of approximately 140,000 net acres in the hydrocarbon-rich Permian Basin of West Texas. Encana specializes in horizontal drilling, a process for extracting oil and gas from horizontal rock structures, such as shale.

Goldman Sachs team members supporting the transaction: *back row*, Peter Smith, Akanchsha Singh, Hank Hilliard, Scott Grandt, Brian Haufrect; *front row*, Bill Lambert, Suhail Sikhtian, Investment Banking Division, Houston

extraction technologies, new refining capabilities and pipelines to transport fuel to markets where it can be distributed and consumed.

Against this new backdrop, at Goldman Sachs, we believe the key to a more stable economic and environmental future is a set of well-defined energy best practices and policies. Among them, carbon limits should be based on a "well-to-wheel" approach, which accounts for the effect of reductions along the supply chain. Further, our strategy must incorporate an "all of the above" approach that encompasses a broad range of fuel sources and types, and one that charts a course to achieving the right mix based on factors such as scalability and sustainability.

Alternative energy technologies, such as wind, solar, and electrical storage, continued to gain ground in 2014, with solar in particular capturing almost 50 percent of all global investment in clean energy, which grew to over $310 billion in 2014, according to Bloomberg.

Mass market adoption of any new, disruptive industry often takes a path of early enthusiasm followed by market rejection, volatility and, ultimately, acceptance. This was true of the Internet, and evidence suggests a similar course when it comes to clean technology and renewable energy. Relatively linear growth in the early years can turn into exponential growth as product awareness increases, demand peaks and additional investment capital follows suit. As noted by Stuart Bernstein, global head of the Clean Technology and Renewables Group in the Investment Banking Division at Goldman Sachs, "We're at a tipping point, where many of these clean technologies will be in homes and businesses in the very near future."

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North American Energy Summit

The North American Energy Summit assembled public and private stakeholders to discuss a strategy for harnessing the continent's energy resources to spur economic growth, enhance national security and regional competitiveness, and promote responsible development of these resources.

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"While technologies continue to evolve and improve, perhaps the biggest developments in the clean energy space in recent years have been innovations in financing and increasing investor support," notes Charles Park, a managing director in the Investment Banking Division's Equity Capital Markets Group at Goldman Sachs. When the first wave of solar companies went public in the mid-2000s, he concludes that "they were viewed not as energy companies, but as technology companies, and attracted an investor base that mirrored that profile — investors comfortable with high growth potential and high levels of risk."

Today, however, investment is growing as the pervasiveness and perception of clean tech comes into its own. In particular, new financing approaches such as "Yield Co" structures offer companies capital at lower costs than traditional means of financing, and provide investors with an attractive total return investment profile driven by both dividends and visible dividend growth.

Convening the North American Energy Summit in June 2014 provided energy stakeholders with the opportunity to foster an ongoing dialogue on the continent's energy future. And in 2015, we are working towards enhancing this dialogue with a series of reports, online forums and meetings to keep the momentum going. At Goldman Sachs, we believe helping our clients make sense of the dramatic changes in the global energy landscape is one of our most important roles in the coming years. Our collective future is dependent upon a multifaceted approach to energy, a collaborative mindset and a commitment to change. ■

INCREASINGLY INTERCONNECTED MARKETS AND INDUSTRIES

Boundaries within markets and industries are dissolving, bringing forth new opportunities for consumers, companies and economies

In New York, an investor buys 5,000 shares of a top software developer — in Korea. In Bern, a pharmaceutical giant searches for the next big biotech startup — in Cambridge, Massachusetts. In California, a young technologist discovers the job of his dreams — helping to drive the strategy of a leading retail company. Increasingly, boundaries between markets and industries are fading in just about every sector, industry and region of the world.

The question is no longer whether globalization is upon us, but rather what, if any, are the limits of its impact? For consumers, an interconnected world means more choices and more competitive prices on the goods and services they want. For the companies trying to reach them, it means more competition, increased pressure to anticipate consumer trends, and unprecedented opportunity to tap into new markets.

The global search for growth has led to a surge in M&A activity, a convergence of companies and industries and an opening up of markets around the world like never before. Looking ahead, these increasingly interconnected markets and industries will bring forth a new reality for consumers, corporates, countries and economies alike.

Borderless Industries and the Return of the Strategic — and Cross-border — Acquirer

Fueled by large cash balances, low interest rates, abundant capital and demands for growth, M&A activity soared in 2014. According to Gregg Lemkau, co-head of Global M&A at Goldman Sachs, "2014 marked the return of the strategic acquirer — big companies using mergers and acquisitions to complement their stand-alone strategies." Worldwide announced M&A volume reached nearly $3.5 trillion in 2014, with Goldman Sachs-advised transaction volume exceeding $1.0 trillion.

Among noteworthy drivers was an increase in the number of cross-border deals targeting European companies. Germany in particular had significant investment coming from both the U.S. and China.

In addition, 2014 saw industries break through the constraints of traditional expectations and boundaries. For example, within the healthcare industry, the convergence between pharmaceuticals and biotech has taken shape. This past year saw an increase in established pharmaceutical companies acquiring innovative biotech companies in an effort to add promising therapies, such as immuno-oncology, to their offerings.

Converging Financial Markets and Dependent Economies

Around the world, a renewed commitment to market liberalization and international trade has the potential to foster growth for decades to come. But no single market is guaranteed such benefits. As consumers increasingly tap into the global marketplace, centers of commerce must compete aggressively for the world's business. Any financial marketplace that is to thrive — if not merely survive — must be as attractive halfway around the world as it is at home.

When it comes to investments and growth, according to Sheila Patel, CEO of International, Goldman Sachs Asset Management, "everyone is thinking not only about the growth in their own economy, but what's

going on elsewhere. What's happening in China? What's happening in Europe or the U.S.? There is so much that's dependent on each other. And, whether it's oil prices or what a central bank does a continent away, it matters today to everyone in terms of their own investments."

In 2014, the economies of Brazil, Russia, India and China inked major agreements that will enhance connectivity in the developing world. According to Goldman Sachs Global Investment Research, trade between Latin America and China has grown exponentially — from $12 billion in 2000 to $289 billion in 2013 — with China being the second-largest source of Latin American imports (after the U.S.) and the third-largest purchaser of Latin America's exports (after the U.S. and the European Union). China was active in its economic reform efforts throughout 2014, as the Shanghai-Hong Kong Stock Connect opened its doors to international investors seeking to invest in companies listed in Shanghai, furthering the globalization of financial markets.

Importantly, the success of this effort comes amid the potential for a bilateral investment treaty, or BIT, which would eliminate many of the restrictions that have previously constrained investment and trade between China and the United States. In July 2014, Goldman Sachs hosted American and Chinese leaders in Beijing for discussions on the BIT and the potential benefits of increased economic activity between the two countries.

The flow of capital is integral to ensuring basic infrastructure and large-scale development in many emerging economies. Put succinctly by Patel, "If the leverage of a great idea that happens in China can be brought to the west coast of the U.S., or the opportunity set up by an Indian technology company can be connected to what's going on in Europe, that's growth for everybody. And that's where interconnectedness presents its greatest opportunity for all of us in the markets today." ■

Our Work with Clients

Goldman Sachs team members supporting the transaction: Mark Schwartz, David Ludwig, Dan Dees, Shan Yee Fok, Xiaoyin Zhang, Eric Liu, Amy Shi, Eddie Byun, Michelle Chen, International Management and Investment Banking Division, Beijing, New York, San Francisco, Hong Kong

Alibaba Group Holding Limited IPO

In September 2014, Goldman Sachs served as joint global coordinator, joint bookrunner and sole stabilization agent for Alibaba's record-breaking IPO with stock listed on the New York Stock Exchange. Raising $25 billion from investors worldwide, the IPO was a tremendous success despite challenges involving its sheer size, complexity and intensive media scrutiny. Alibaba is recognized as the largest online and mobile commerce company in the world. As disclosed, its holdings include the TaoBao Marketplace, China's largest online shopping destination; Tmall.com, China's largest third-party platform for brands and retailers; Juhuasuan, China's most popular online group-buying marketplace; Alibaba.com, the largest global wholesale marketplace; and AliExpress, an online retail marketplace that enables consumers worldwide to buy directly from Chinese exporters.

Goldman Sachs team members supporting the transaction: Kate Richdale, Christos Tomaras, Vikas Bathla, Marios Broustas, Manita Shinh, Rob Pulford, Investment Banking Division, Hong Kong, London

PizzaExpress

In a transaction that demanded global coordination, Goldman Sachs helped Cinven, the European private equity firm, sell PizzaExpress, a leading U.K. restaurant operator, to an overseas buyer for approximately £900 million. Building on its long-established leadership position in the U.K. casual dining market, PizzaExpress gives Beijing's Hony Capital an opportunity to introduce a Western casual dining experience to Asian consumers. To speed the sale and enhance competition in the process, Goldman Sachs marketed PizzaExpress to investors worldwide and coordinated the necessary financing that culminated in the placement of £610 million in senior notes, further providing Hony Capital with the assurance it needed to move forward with the acquisition.

Goldman Sachs team members supporting the transaction: Gregg Lemkau, Christoph Stanger, Patrick Perreault, Christian Stammschulte, Annika Maldener, Christopher Droege, Tobias Koester, Investment Banking Division, New York, London, Frankfurt

Grohe Sale to Lixil

At the time of the closing of the transaction in January 2014, the $3.4 billion sale of an 87.5 percent stake in Germany-based Grohe, a water technology company owned by U.S. investors, to Lixil Corporation of Tokyo and the Development Bank of Japan was the largest-ever acquisition of a Germany-based company by a Japanese company. Under the ownership of financial sponsors TPG and DLJ Merchant Banking Partners, the Grohe management team transformed the company into a global leader with attractive positions in high-growth markets. Goldman Sachs served as financial advisor to both sellers and provided integrated M&A advice, with expertise from its global team based in Frankfurt, London, New York, Tokyo and Beijing.

Goldman Sachs team members supporting the transaction: Lei Shao, Xiaoyin Zhang, Leon Foong, Richard Campbell-Breeden, Nikhil Taneja, Investment Banking Division, Hong Kong

Lenovo Group's Purchase of IBM's x86 Server Business

Lenovo, a global Fortune 500 company, is a leader in providing innovative consumer and enterprise technology products and solutions to customers in more than 160 countries. The company set the pace for M&A last year with the $2.3 billion acquisition of IBM's x86 server business. The deal, announced in January 2014 and initially closed in October 2014, was a logical next step for a company growing its global enterprise hardware leadership position. In advising Lenovo, Goldman Sachs brought a wealth of cross-border experience to the deal — critical in this complex transaction involving multiple business carve-outs and strategic relationships. This was the second major M&A transaction between the two companies, following Lenovo's purchase of IBM's ThinkPad PC business in 2005, in which Goldman Sachs was also financial advisor to Lenovo.

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Podcast
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THE GLOBAL CAPITAL MARKETS: FUELING ENTREPRENEURSHIP, OPPORTUNITY AND ECONOMIC GROWTH

The future dynamism of our global financial system hinges upon continually improving our ability to match pioneering ideas with investment capital. We must continue to explore ways to spur innovation, which is at the heart of a free market system, and fundamental to the process of identifying, investing in and implementing better ways to do things — in a word, *progress*.

The global economy continues to work through the structural issues necessary to return to normalized growth. But, at a time when governments are grappling with budgetary constraints and the nonprofit sector is increasingly overburdened, private sector innovation and capital are also emerging as powerful tools to address various societal challenges.

A growing number of investors are signaling a desire to put their money to work not just to achieve their financial ends, but also to make the broader system stronger. Last year, Goldman Sachs was involved in a number of activities and transactions that sought to leverage the innovative thinking and market expertise of our people to help address some of these broader challenges.

More specifically, in 2014, Goldman Sachs worked alongside the World Bank Group's International Finance Corporation (IFC) to help address a challenge faced by women entrepreneurs around the world — lack of access to capital to help grow their businesses. The IFC estimates that as many as 70 percent of women-owned small- and medium-sized enterprises in developing countries are unserved or underserved by financial institutions, resulting in a credit gap of around $285 billion.

Together, Goldman Sachs and the IFC have created The Women Entrepreneurs Opportunity Facility, the first-ever global financing facility for women-owned small- and medium-sized enterprises, a $600 million commitment to encourage local banks in emerging markets to substantially increase lending. It is our expectation that this facility will enable 100,000 women entrepreneurs around the world to access capital to grow their businesses. To date, we have reached 25,000 women entrepreneurs in seven emerging markets, and the facility made $150 million in committed investments.

This commitment is an outgrowth of the firm's global *10,000 Women* program, which has reached women in 43 countries through partnerships with 90 academic and nonprofit institutions to provide business and management education, mentoring, networking and access to capital to more than 10,000 women. Research from a range of organizations has shown that investing in women and girls is one of the highest return opportunities available in the developing world. Indeed, independent assessments of the *10,000 Women* program, by leading institutions like the International Center for Research on Women and Babson College, have confirmed immediate and sustained business growth for graduates of the program. Within 18 months of graduation, nearly 70 percent of participants have reported increased revenue and nearly 60 percent reported having created new jobs.

Goldman Sachs has also been a pioneer in the creation of the "social impact bond," an innovative and emerging financial instrument that leverages private investment to support high-impact programs. As a public/private partnership designed to deliver ambitious social programs to underserved communities, in 2014, we launched social impact bonds that will fund pre-kindergarten education for 2,620 Chicago public school children over four years, and a program that works to reduce recidivism and improve employment outcomes for high-risk young men in the greater Boston area.

Environmental sustainability continues to be a focus across both the public and private sectors. In February 2014, the Goldman Sachs Environmental Finance Innovation Summit brought together companies, investors, development banks, NGOs, policymakers and key thought leaders to discuss market-based approaches to the environment. A particular focus of the Summit included green bonds to fund new projects, green banks to finance clean energy technologies and public/private partnerships to address critical water infrastructure and other needs around the world.

Goldman Sachs has been an innovator in the green bond market, a market that saw nearly $39 billion in new issues last year, more than twice the volume in 2013, according to Bloomberg. We served as lead bookrunner on the first green bond issued in Latin America, a $204 million 20-year bond that will refinance debt for Peruvian wind farm operator Energía Eólica. We were also lead left bookrunner for the first century green bond and the first U.S. green bond to have an independent sustainability opinion. The $350 million bond issued by DC Water and Sewer Authority will finance a portion of its Clean Rivers Project, a massive storm water infrastructure program that will nearly eliminate combined sewer overflows into the city's major waterways, including the Anacostia and Potomac rivers.

We remain committed to developing innovative programs and solutions to help bring economic growth, stability and opportunity to communities around the world. ■

View video

Access to Capital for Women Entrepreneurs

In March 2014, Goldman Sachs *10,000 Women* and the World Bank's International Finance Corporation announced an initiative to create the first-ever global finance facility for women-owned small- and medium-sized enterprises.

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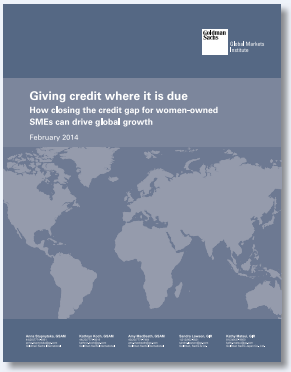

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