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LETTER FROM THOMSON REUTERS CEO JAMES SMITH

We're on the cusp of massive electrical-energy changes that will have a lasting impact on global business and commerce. The recent volatility in oil prices has created a ripple effect in virtually every industry around the globe.

Carbon markets and emissions trading schemes are driving new energy investments. Stranded assets and carbon taxes give accountants and tax attorneys new financial considerations. Legal ramifications related to coal and hydraulic fracturing open new challenges, and opportunities, in the field of law.

Disruptive energy technologies are being funded and commercialized by innovative companies around the world, and scaled as viable solutions for how we structure, operate and succeed in the future.

US President Barack Obama's 2011 State of the Union Address set a goal of having 80 percent of the country's electricity generated from clean-energy sources by 2035, while the conclusion of last year's historic COP21 Summit involved nearly 200 heads of state from countries that agreed to take a united stance against global-greenhouse-gas emissions and energy sources that contribute to them. It is certain that changes are afoot in the sources of power we use and how they impact us as business leaders.

Thomson Reuters is uniquely positioned to provide valuable insight on this topic. Our strategic solutions and information resources offer a one-of-a-kind perspective on a multitude of factors related to energy, from legal and tax implications to investment opportunities and emissions trading schemes.

This document is the first in a series of enterprise perspectives that provides a holistic view on big issues using detailed snapshots of the ones ustNe07e31 them. ase and2soain tha.rmatio-3 (s.)TJ0 Tc 0 l(OP2k)16 (el)5 (aou0.9 (e)-1 (d t)4 (o t)4 r5 (as)4 (td-



Introduction

There's a perfect storm brewing that's destined to have a lasting impact on all of us.

The frequency and severity of catastrophic weather events have reached an all-time high while the price of oil has plummeted to a near-record low. Public sentiment is calling for the preservation of our planet for future generations. Social media and news articles tout an increase in global temperatures, decrease in fossil-fuel appetite and the difficult challenge of actualizing 2015's historic Conference of Parties (COP21) agreement. From farmers to federal agents to front-office business executives, the world's attention is focused on how to manage risk and secure a stable future.

While very few can agree on the best path forward for addressing this challenge, the one thing pretty much every constituency does agree on is that global energy production plays a central role in the debate.

There are many sources of greenhouse gas emissions including a significant percentage coming from methane production associated with fracking and well pads, as well as carbon monoxide and carbon dioxide emissions associated with the burning of fossil fuels to generate electricity. In order to reduce global warming and our carbon footprint, we need to change the sources of energy on which we rely. To preserve our planet and reduce the risk of the Digital Age's environmental waste, we need to better understand the energy mix and prepare to capitalize on technologies that will be viable (and scalable) in the next 10-30 years.

Is it even possible to achieve the outcome set forth at COP21: a 2-degree Celsius cap in the rise of global temperatures above Industrial Era levels? What impact will changes made and specific incentives have on businesses

today, and tomorrow? With this as part of the backdrop as we move through 2016, Thomson Reuters analysts address the topic of energy by focusing on the future of power, methods for generating electricity over the next several decades and what it means for business around the world.

ENERGY

From the first moment of our universe's inception to the recent discovery of the Higgs boson particle, energy has been an essential component of life. Different forms of energy produce different results, providing the power necessary to fuel our bodies, vehicles, homes, communities and planet.

The journey of energy that powers the planet has been varied. In the beginning, the sun was the main source of power. However, technology to harvest its power has only recently become scalable and viable. In its early days, it was used to grow food and provide warmth. Today, it can power automobiles and cities.

With the introduction of fire came the eventual incineration of various combustible materials, including coal. Oil was next, the purported godsend for powering vehicles, heating homes and producing electricity to power the proliferation of electronic devices used daily. Today, all of these methods of power generation persist, yet even more advanced options, many of which we refer to as renewables, are also increasing in viability.

The purpose of this paper is to showcase the primary methods of generating electricity that will be used to power earth in the next 10 to 30 years, providing insight into their benefits and drawbacks based on perspectives from industry experts and using Thomson Reuters data and solutions. ●

The Fossil Fuel Conundrum

The perils of greenhouse gas emissions from burning fossil fuels are well-documented, and while this report is primarily associated with power generation in the form of electricity, it is important to look at emissions across all sectors to get a complete picture of the situation.

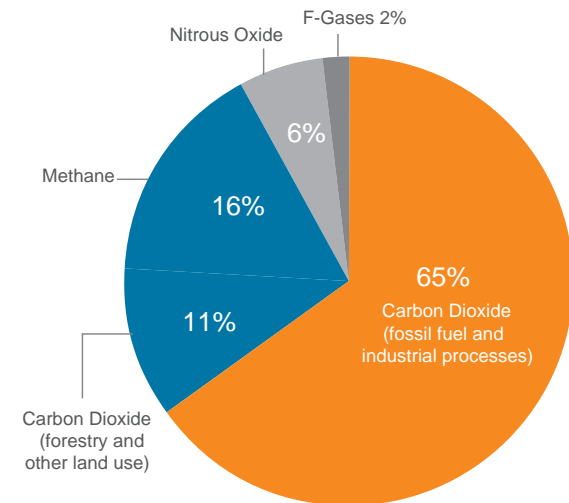
Despite the known perils, fossil fuels continue to persist as dominant power sources at present (see **Figures 1A** and **1B**). In fact, the European Commission's Joint Research Centre & Institute for Environment and Sustainability reported that global emissions from fossil-fuel combustion and industrial processes reached 35.7 billion tonnes (Gt) in 2014, the highest year on record (prior to 2015 data being available).¹

The Thomson Reuters Global 500 Greenhouse Gas Report: The Fossil Fuel Energy Sector² outlines how the GHG-emissions gap is widening. For example, from 2010 to 2013, emissions increased by 1.3 percent when they should have decreased by 1.4 percent per year. This equates to a 5.5 percent gap over that period. **Figure 2** shows the projected long-term effects of this gap and sharp adjustment needed to meet goals set for 2050.

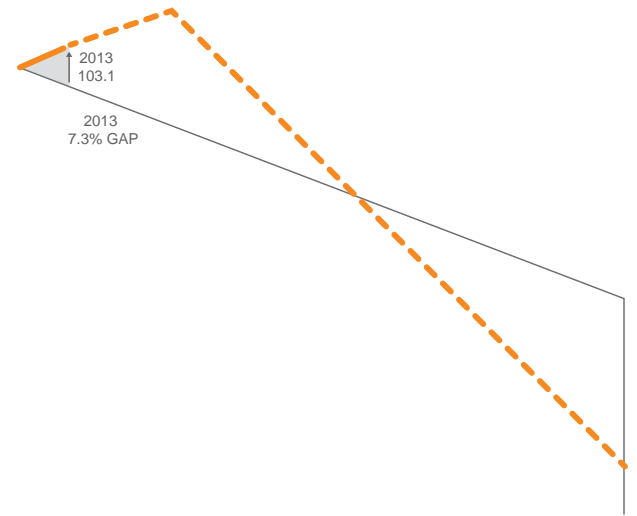
Despite their ubiquitous prevalence, fossil fuels have peaked. Thomson Reuters analysts state that it's now clear that 2005 was the year with the largest volume of oil consumption in the US and other advanced economies, as reported in **A Brief History of the Oil Crash**.

A confluence of factors has contributed to the decline of oil: the shifting landscape and production of oil in the Middle East and elsewhere, an increase in shale drilling and natural gas consumption, and expanded awareness of the ill effects of greenhouse gas emissions. These have resulted in extremely low oil prices. **Figure 3** shows hedge fund positions versus oil prices for the 12 months of 2014. Brent oil dropped over the last quarter of that year from \$86/barrel to less than \$47/barrel at the beginning of 2015, and the slide has continued.

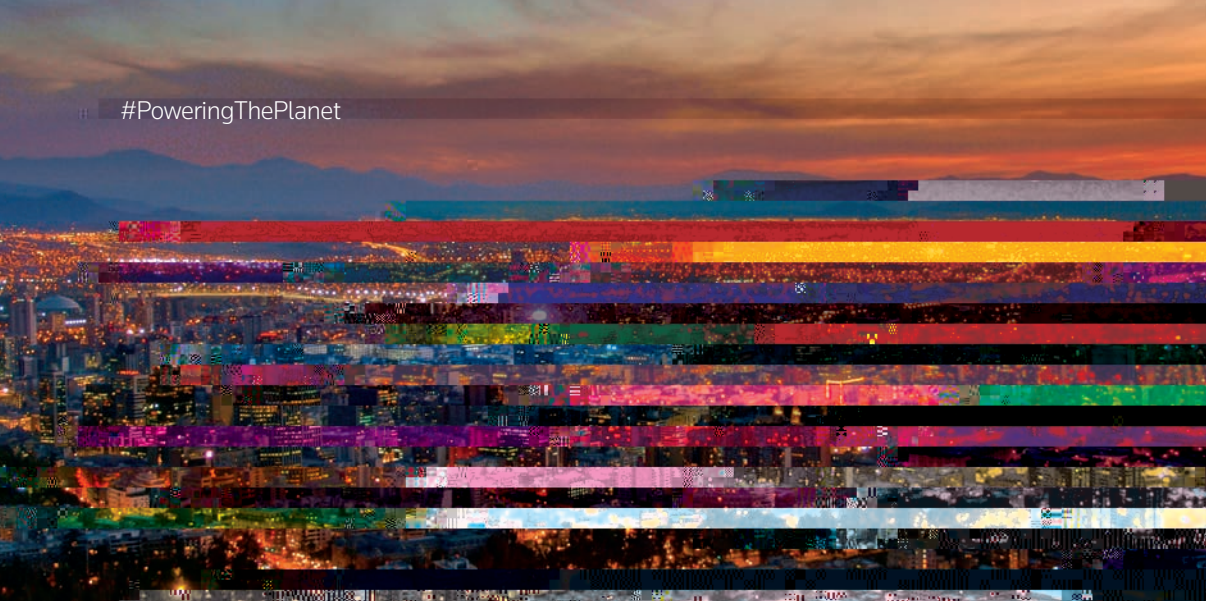
Figure 1A. Global Greenhouse Gas Emissions and Their Sources (2010)



Source: Intergovernmental Panel on Climate Change (IPCC)³



#PoweringThePlanet



The Fossil Fuel Conundrum

Hydraulic Fracturing (“fracking”) – A Thomson Reuters Author’s Perspective

From an interview with Professor James T.
O’Reilly, author of **The Law of Fracking**

THOMSON REUTERS: Is fracking a risk in itself?

JAMES T. O’REILLY: No, it is a technique that
maximizes recovery in it. m4

LITIGATION: OIL & GAS vs. COAL

Professor O'Reilly warns about the potential for increasing litigation and legal action related to hydraulic fracturing, greenhouse gases, oil and gas transportation, among other things. In order to monitor this, it's important to have a benchmark to understand the current litigation landscape for leading sources of power that generate electricity.

The Oil & Gas and Coal industries face differing challenges in terms of litigation. Westlaw® data on cases in US District Courts from 2012 to 2015 reveals significant differences in the makeup of lawsuits impacting each industry, reflecting a degree of their divergent fortunes.

Oil & Gas

For the Oil & Gas industry, torts/negligence cases make up the largest proportion of lawsuits. A sizable minority percentage of those cases are related to the BP/Deepwater Horizon accident in 2010 and resulting litigation.

Together with commercial law & contracts and real property cases, the top three practice areas make up roughly half the lawsuits the industry faced from 2012 to 2015, as shown in **Figure 4**.

Coal

In contrast, the Coal industry faces increasing pressure on several fronts, including stricter, more costly environmental regulations and competition from significantly lower oil prices. This has led to higher levels of corporate debt, falling profit margins and widespread layoffs.

Analysis of lawsuits on Westlaw reflects some of these pressures. Employment and labor law cases make up the largest proportion of them, as companies, labor unions and wor 6i-5(f)ab/Ourg7(oymen)2(t 037t marer)-14(t)aw caset and liermof colTJ vgations

Environmental cases made up a slightly higher percentage of lawsuits for the Coal industry (5.6 percent) compared to the Oil & Gas industry (3.6 percent). Meanwhile, bankruptcy cases made up 4.1 percent of cases facing Coal, as shown in **Figure 5**, as more than half a dozen coal producers filed for bankruptcy in 2015. In comparison, bankruptcy cases made up less than one percent of cases for the Oil & Gas sector.

Patent Litigation in the Oil & Gas Industry

Many of the major Oil & Gas industry players have avoided being involved in patent litigation in US courts in recent years, the notable exception being Royal Dutch Shell PLC.

Analysis of Westlaw data from 2012 to 2015 shows that Royal Dutch Shell was named as a defendant or counter-claimant in nine cases in US Federal Courts, by far the most of any Oil & Gas company, as shown in **Figure 6**. BP Biofuels North America LLC, part of UK-based BP PLC, was named in five cases. Marathon Oil Corp. was a defendant in two. Gulf Oil LP, BP Energy Co., and Occidental Petroleum Corp. had one case each over the same period.

Notably absent are many of the other large oil and gas companies, particularly US-based ExxonMobil, Chevron and ConocoPhillips.

Nearly all the litigation was filed by smaller companies, claiming that others had illegally appropriated their technology. An example is Deep Water Slender Wells Ltd., a small US-based company, which claimed that Shell had infringed on its patent for deep-water drilling technology.

Major Oil & Gas companies were rarely involved as plaintiffs. Royal Dutch Shell PLC filed

Carbon Markets

Thomson Reuters Carbon Markets Team Sheds Light

While litigation may generate financial rewards for one of the involved parties, carbon markets and emission trading schemes (ETSs) are other mechanisms important to the energy ecosystem that can also reap rewards for the involved parties.

The growth of carbon markets is a 21st century phenomenon resulting from political mandates to reduce carbon emissions and mitigate global warming. As with carbon taxes, the aim of emission trading schemes is to put a price on emissions, make it more expensive to pollute and create incentives to put abatement measures in place. Unlike taxes, however, ETSs enable private companies in domestic markets to trade carbon credits as commodities. The role of the market is to identify abatement measures with the lowest cost, thereby ensuring a cost-efficient delivery of the reduction targets put in place by policymakers.



Countries with higher carbon outputs can also purchase credits to emit more greenhouse gases from nations with lower output, although this is a much smaller portion of the global market. Emission trading schemes target carbon dioxide and in some cases other harmful greenhouse gases, as calculated in tonnes of carbon dioxide equivalent or tCO₂e.

According to the Thomson Reuters Point Carbon team, some 6.2 gigatonnes worth of emission allowances and offsets were traded globally in 2015, valued at approximately 50 billion euros, as shown in **Figure 7**. 2012 was the most recent banner year for trading. Expectations for 2016 are for volumes to rise slightly over 2015, for T8Fries acobsng tigher c

Table 1. The Size of the Global Carbon Markets, Beginning in 2013 and Projected through 2018
 Projections are for incremental growth in 2016 and 2017, with a slight tapering in 2018.

	FINAL FIGURES		FINAL FIGURES							

Thomson Reuters assessment of the volume and value of the major carbon markets from 2013 to 2015, and forecasts for 2016 to 2018. Volumes in millions of tonnes (Mt).
 Thousand megatonnes = one gigatonne (Gt). Values in millions (m) of euros. Thousand million = one billion (bn).

Source: Thomson Reuters Eikon & Point Carbon



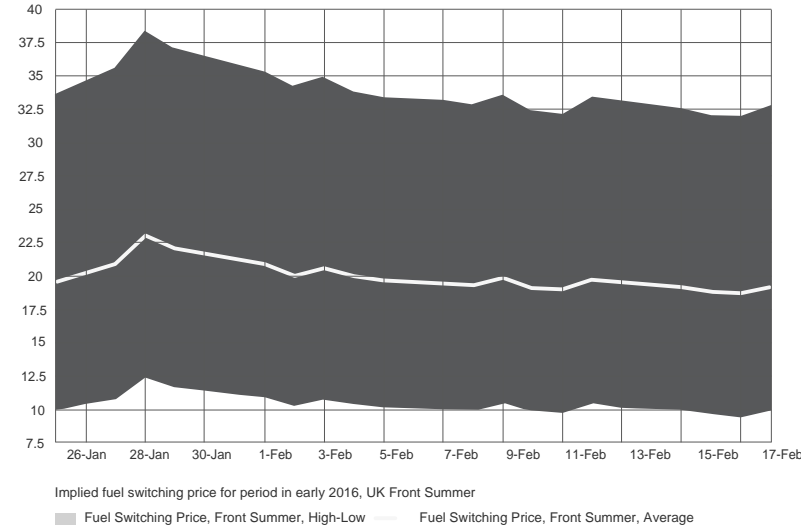
THE ROLE OF CARBON PRICING

Given the Paris Agreement and the international effort to limit global warming, there is now universal support to keep the global temperature increase well below the two degrees Celsius target and eliminate net carbon emissions in the second half of this century.

According to Stig Schjolset, head of carbon research and forecasts for Thomson Reuters Financial & Risk, the agreement will likely accelerate the ongoing transformation of the Energy sector. After Paris, all assets in fossil fuels should have a higher risk premium attached, making the case for renewable-energy investment stronger than ever before. The long-term direction toward a low-carbon future is clear.

The Paris Agreement also gives a push for increased use of carbon pricing. This will not take the form of a uniform price agreed at the UN level. Rather, it will be a bottom-up process where several countries will implement carbon taxes or emission trading schemes in order to meet the domestic reduction targets they have pledged under the agreement. Such carbon markets are already in place in Europe, Korea, New Zealand and several states in the US. And, the share of emissions included in these trading schemes will increase significantly as China

Figure 8. Fuel-Switching Price



Source: Thomson Reuters Eikon

“... renewable energy will likely be the most profitable investment when adding new capacity in power markets around the world.”

Stig Schjolset,
Head of Carbon Research
and Forecasts,
Thomson Reuters
Financial & Risk

intends to roll out a national carbon market in 2017. According to the initial plans, the Chinese market would cover some 10,000 companies, including nearly all power generators as well as some industry sectors and aviation, in total accounting for around 45 percent of the nation's emissions.

Thomson Reuters Carbon Research and Forecast analysts point out that countries and jurisdictions with ETSs are already talking to each other, aiming to coordinate their efforts. It is thus possible that within the next 10-15 years,

the regional carbon markets will start to link up with each other, potentially making several of the large economies in the world subject to comparable carbon prices.

“In order to meet the overall targets agreed in the Paris Agreement, the level of ambition – which in the end determines the price on carbon allowances – must be significantly increased over the next decades,” said Schjolset. “If the big emitters are able to move forward in such a coordinated way, it might be possible to scale up the climate ambition significantly. Even

a moderate carbon price could have a huge impact on the global energy mix as it would make natural gas more profitable relative to coal and make it more attractive to invest in renewable energy.”

The main aim of a carbon pricing scheme is to make it more expensive to emit carbon and more attractive to invest in low-carbon



The landmark climate accord in Paris thrust the idea of a carbon tax back into the global spotlight. Tesla Motors Chief Elon Musk has also taken up the cause, making the bold proclamation that a widely implemented carbon tax would cut the amount of time it would take

CARBON TAX DIFFERENCES

What makes the carbon tax concept work in some places and not others? Anil Kuruvilla, senior manager for tax research and content at Thomson Reuters, explains that the issue has as much to do with base politics as it does with the complexity of the tax itself and different

the carbon tax, which every Australian taxpayer was feeling in their wallets, despite the fact that it was designed as a revenue-neutral tax for the Australian government. That kind of volatile swing in policy based on populist sentiment can play a major role in tax.”

This last point is critical for the US because tax policy has become such a polarizing issue. Dr. Steven A. Cohen, Executive Director and Chief Operating Officer of Columbia University’s Earth Institute, explained the issue this way:

“My particular issue with the carbon tax is not that it’s bad or good. I just don’t think it’s feasible here in the US. I’m a political scientist; I study how issues get on the agenda and this one has made so little progress and has been met with such resistance that we’re just spinning our wheels to pursue it.”

Add the conflicting agendas of the various parties who’ve been most vocal on this issue: a billionaire CEO of a company that sells luxury electric vehicles; oil companies who stand to benefit long-term from a carbon tax by shifting more demand into their natural gas businesses; and monetary relief organizations that are concerned about the impact of regulation on the global economy, and the political risks associated with carbon tax policy shine in sharp contrast.

Though the timing of when a globally accepted and implemented carbon tax is open for debate, tax practitioners in the Corporate, Financial and Government sectors will no doubt be interested to see where the debate goes. As Brian Peccarelli observes:

“Staying abreast of global tax policy changes and trends is a must; the ramifications of a universal carbon tax to businesses and governments would be truly significant and far-reaching. It’s with a view toward preparing for future tax developments that solutions such as Thomson Reuters Checkpoint® are designed for. Providing real-time information, tools, technology and research on content that spans tax, accounting, finance and trade, Thomson Reuters Checkpoint allows business leaders to make intelligent decisions in a complex tax landscape.”

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Unburnable Carbon and Stranded Assets

Perspectives from GAAP Reporter, a Thomson Reuters
Tax & Accounting resource on Checkpoint

Beyond straight taxes imposed on companies for producing carbon emissions, individual company balance sheets are also susceptible to volatility at the hands of greenhouse gas emissions and related climate change events. There's a potential looming threat of "stranded assets" appearing on company balance sheets as climate change continues to reach its tentacles into more areas of business and commerce.

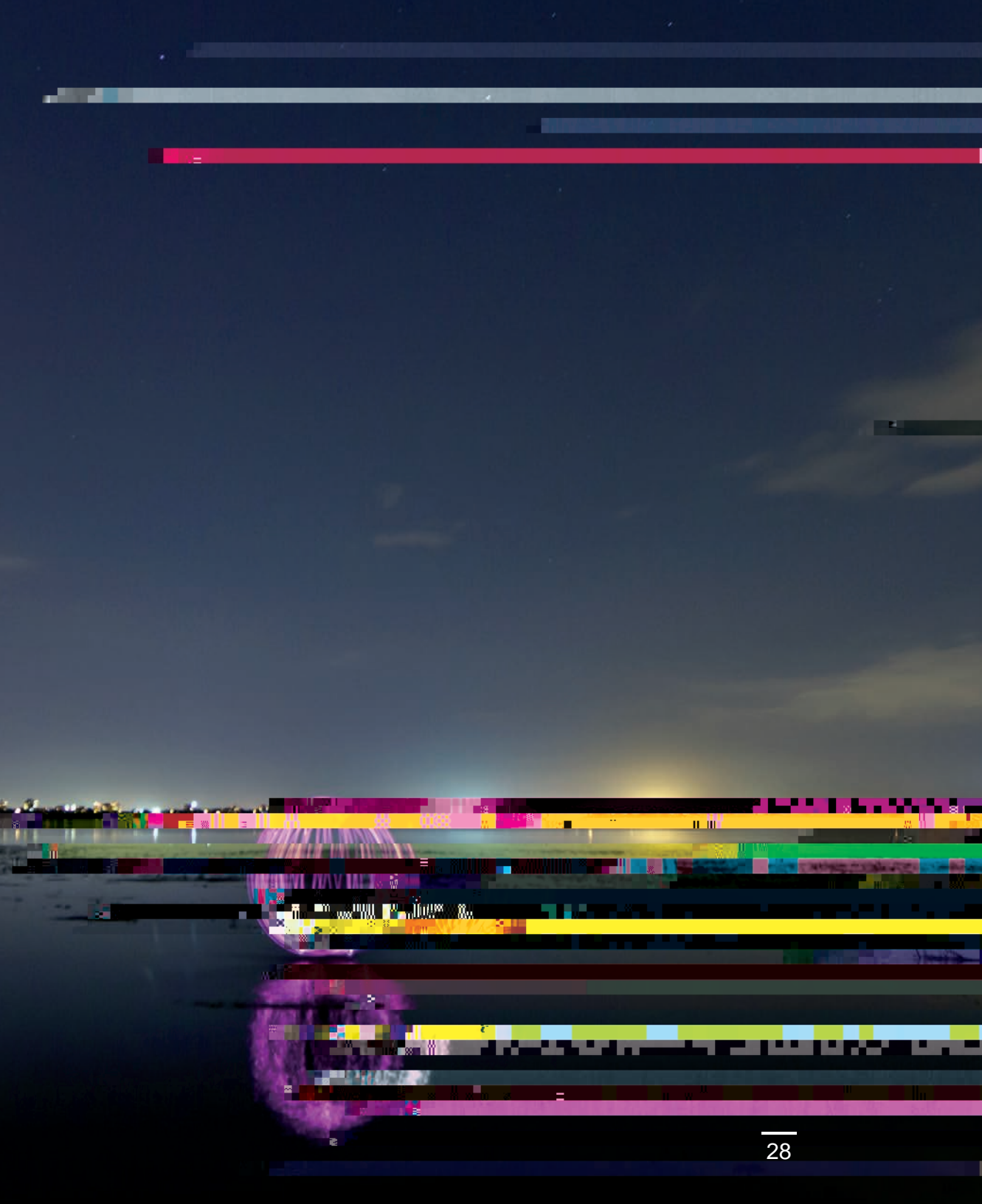
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Hurricane Katrina (\$151 billion), Hurricane Sandy (\$67 billion), and the California drought are among the 178 US disasters over the last 35 years with individual costs in excess of \$1 billion. These organizations, experts in documenting risk, conclude that there is a strong likelihood that the effects of climate change will lead to increasing financial losses. According to a comprehensive 2014 study by the CDP (formerly, the Climate Disclosure Project), S&P 500 businesses are increasingly reporting climate-related physical disruptions and incurring costs. These companies are assessing financial exposure to physical assets with "increasing urgency."

As assets become increasingly at risk of becoming stranded due to climate change both from weather-related events and the loss of fossil-fuel productivity, more attention to accounting and disclosure is required. These risks are carried not only by a reporting company, but also by its lenders and investors. Given the magnitude of financial investments at risk, business leaders are raising red flags. For example, Nick Robins, former Head of HSBC Climate Change Centre of Excellence, now Co-Director of United Nations Environment Programme (UNEP) Inquiry into the Design of a Sustainable Financial System, has advocated for financial market participants to make informed assessments of climate change risks to encourage a “soft landing” rather than a crisis initiated by an event.

Henry Paulson Jr., former US Treasury Secretary under President George W. Bush, has similarly warned that the financial markets must recognize and respond to climate risk. Mark Carney, Governor of the Bank of England, is leading investigations into the effects of stranded assets on financial stability, particularly in the insurance industry.

A company and its investors can ensure robust assessment and appropriate disclosure to help avoid wasteful losses and direct capital to safer and more sustainable alternatives before a catastrophic event triggers accountability. ●



The generation of electricity in the future will look much different from how it does today. By the end of this century, fossil-fuel-based sources will be all but dried up, figuratively and possibly literally. In their place will be the next generation of renewables, some of which have an established footprint today and some of which are still to be discovered.

The transition to tomorrow's sources will be consistent and persistent. The goals set forth in Paris, December 2015, caught the world's attention and there's no question that the attainment of them will require change. The challenge is to find balance. Things will evolve

From a business standpoint, it is imperative that the leaders of today, and tomorrow, be ready for what is to come. In short, they need to begin preparing for a future where renewables play a larger part in the mixture of methods used to generate electricity. But, how, exactly, will we get there?

Anecdotal evidence on the suburban streets of America and sub-Saharan Africa suggests that solar is on its way to going mainstream as homeowners with big tax incentives strap

There are nine main areas of electrical-power innovation within which activity has been happening:

- Clean Coal
- Coal
- Hydro-Wave
- Natural Gas
- Nuclear
- Petroleum
- Solar Photovoltaics
- Solar Thermal
- Wind

Figures 12A and 12B show the comparison in innovation activity across each area over a six-year period (notice the change in the y-axis between the two charts). Solar Photovoltaics continues to hold the lead position, representing over 7,500 inventions more than Petroleum, the second-most-active category in terms of overall volume.

Solar Photovoltaics grew by 160 percent over the six years and has the largest overall activity with 17,569 unique inventions at the end of 2015. This is the second-most-significant increase of electrical-power sources studied. Clean coal had the largest overall growth rate at 181 percent, as shown in Table 2, although it occupies the lowest point across the group.

Solar thermal saw just 10 percent growth over the same timeframe, the smallest of all sectors, and closed out last year with a decline from its peak point in 2013. For this reason, solar thermal has been eliminated from the remainder of analysis, and the report focuses on areas showing the sharpest growth and promise.

Figure 12A. Top Electrical-Power-Related Innovation Areas, #1-#4 (2010 – 2015)

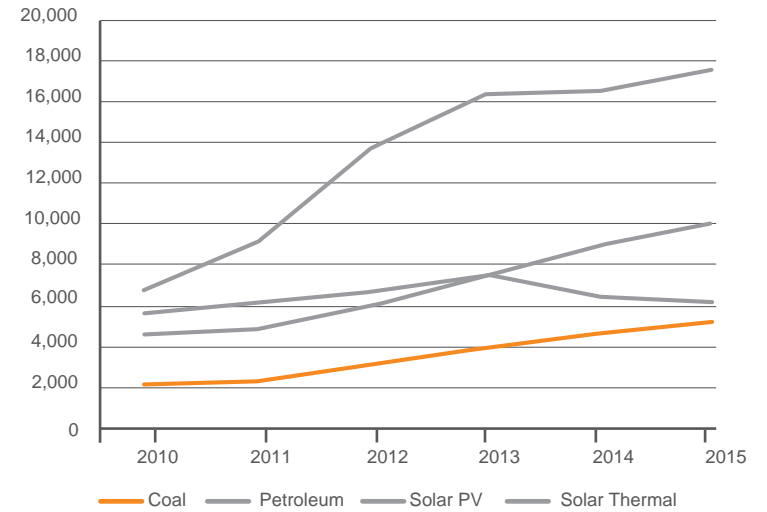
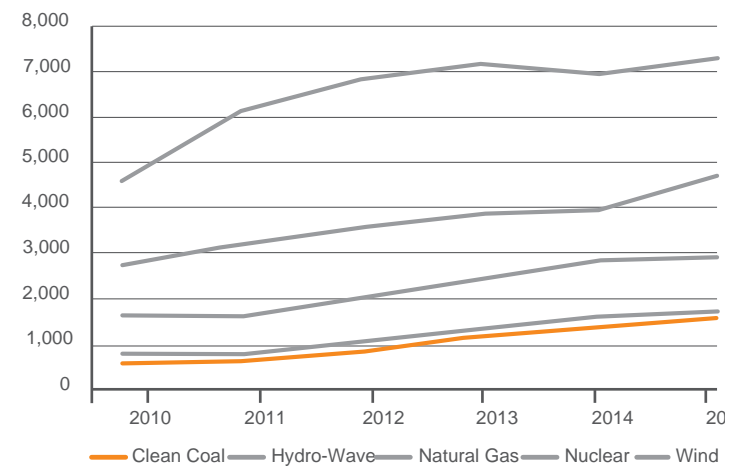


Figure 12B. Top Electrical-Power-Related Innovation Areas, #5-#9 (2010 – 2015)



Source: Derwent World Patents Index

TOP ENERGY INNOVATORS

The top energy innovators span the gamut from the likely to unlikely, as seen in **Figures 13A, 13B** and **13C**. Likely innovators have titles such as Hitachi-GE Nuclear Energy, PetroChina

GREENHOUSE GAS MITIGATION

Fossil-fuel-related innovation increased by 122 percent from 2010 to year-end 2015, with the sharpest incline coming after 2011. The majority of the invention investment has been associated with combustion methods that generate greenhouse gases. Greenhouse gas (GHG) mitigation-related inventions, also associated with fossil fuels, experienced a jump of 197 percent during that same period, albeit starting from a much lower base, as shown in **Figure 14**.

There are different ways to mitigate greenhouse gases resulting from fossil-fuel electrical power generation. Some of these include purifying carbon monoxide, withdrawing gas, treating the smoke and fumes, and removing it altogether. All areas associated with electrical power generation have seen an increase in activity over the last six years except CO₂ mitigation, as shown in **Figure 15**; the modification or purification of carbon monoxide as it is produced is the most active area.

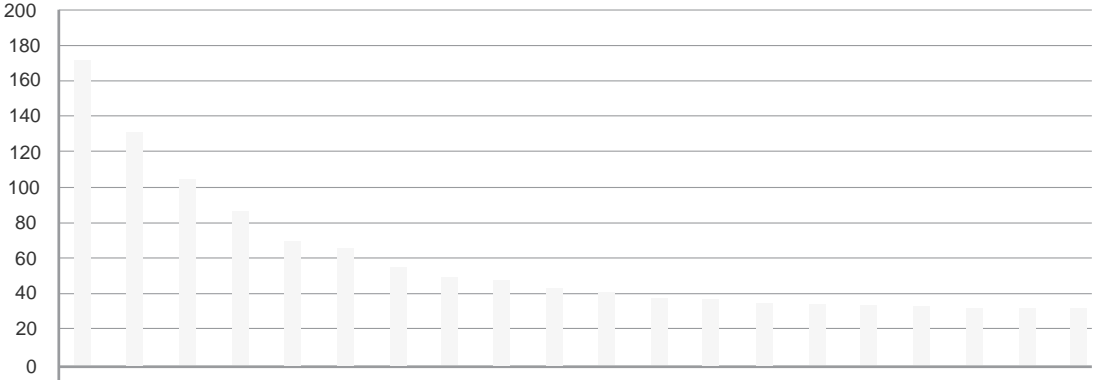
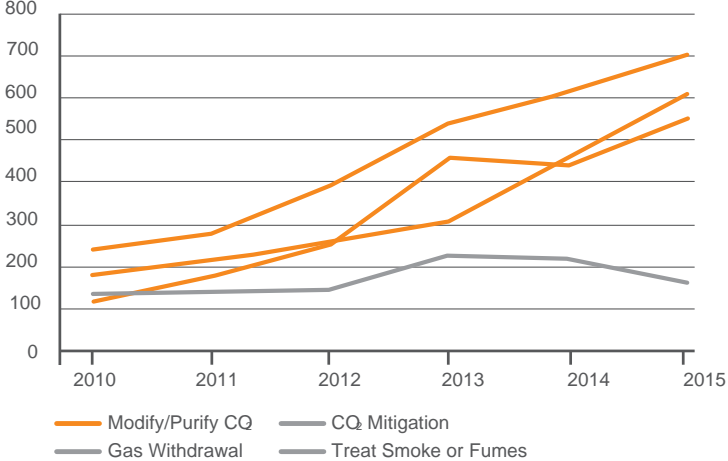
Efforts to reduce or eliminate greenhouse gases from by-products associated with electricity generation are international in scope, but Asian companies including Mitsubishi, Hitachi, Xinli Energy, CAS, Sinopec and Nippon Steel are among the top organizations in this area. European and US companies are also present, but to a lesser extent, as seen in **Figures 16A** and **16B**.

The second figure, 16B, shows the top five innovators in the area. They are all fairly diversified in their mitigation techniques; however, it is really only Hitachi that is concerned with mitigating the emission of carbon dioxide entirely, versus somehow purifying, withdrawing or treating it. Alstom and GE recently announced a merger. Their approaches to clean coal are complementary to one another, which gives credibility to their decision.

Figure 13C. Organizations (#17 - #24) in Energy-Related Innovation (2010 – 2015)

Figure 15. GHG-Mediation Innovation from Fossil-Fuel Energy

Methods (2010 - 2015)







THOMSON REUTERS How do you see the level of oil dependence evolving over this century?

BJØRN OTTO SVERDRUP Through our Energy Perspectives report each year, Statoil presents several scenarios for the energy mix and demand leading up to 2040. Our Renewal scenario, which envisages a world that stays below 2 degrees Celsius (3.6 degrees Fahrenheit) of global warming, as the Paris agreement sets out, includes substantial amounts of oil and gas, but oil demand starts to taper off after 2020.

Despite expected reduced demand in the future,



HYDRO-WAVE

Water-related innovation for generating power has been on a steady climb over the last several years, including both power secured from the movement of fluids by gravity (hydro) and oceanic/sea tidal movement (wave). The former jumped by 60 percent and the latter by 82 percent from 2010 through 2015, as shown in **Figure 17**. Although hydro has had more

Figure 19. Hydro-Related Water Innovation (2010 – 2015)

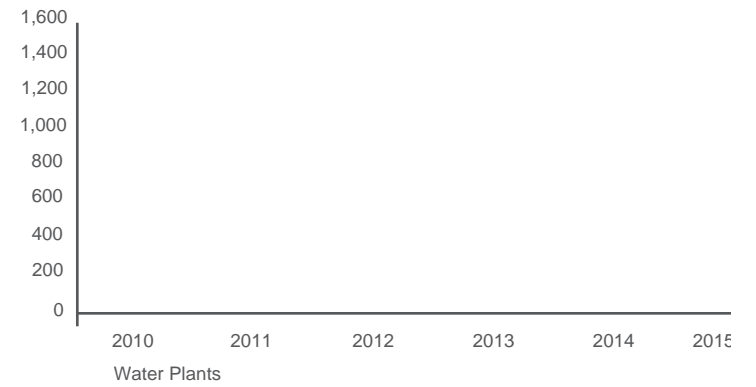
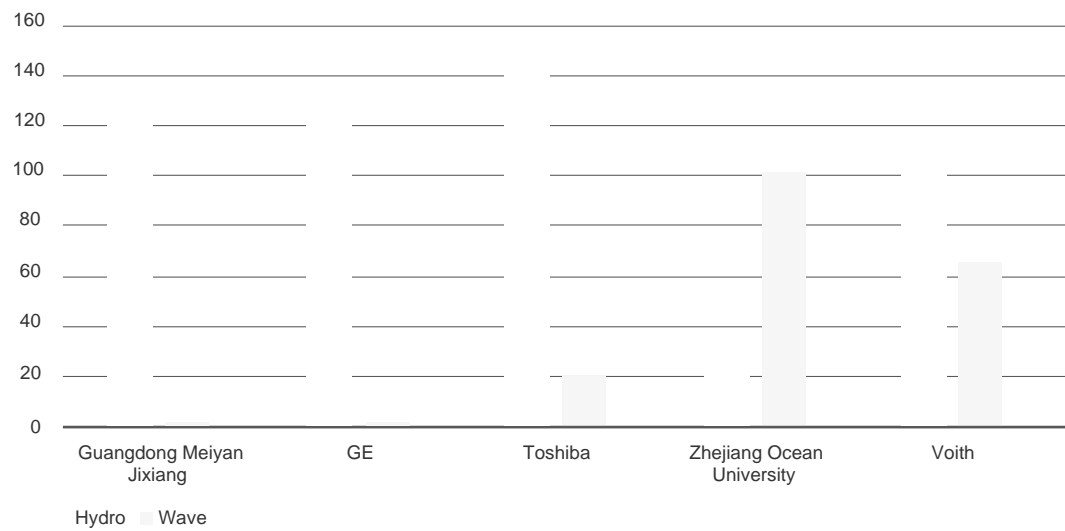


Figure 20. Top 5 Water-Based Power Innovators by Type (2010 – 2015)



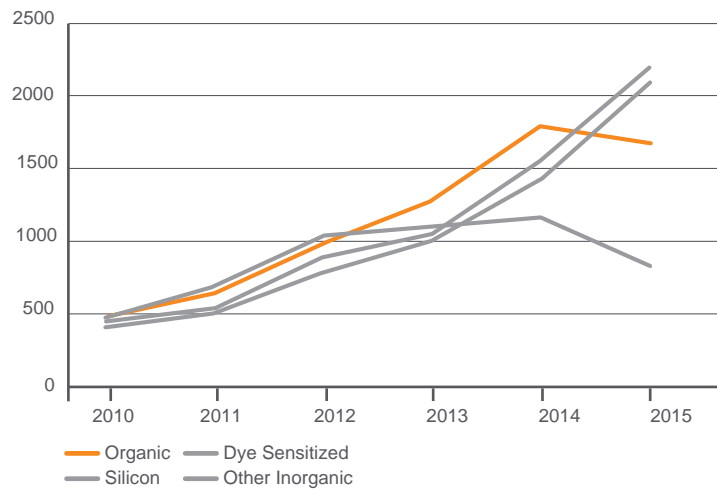
The Top Solar Innovators

There's a lot of overlap between the companies innovating in solar cell materials versus photovoltaic components. **Table 4** shows the top companies across both segments and their respective placements. Sharp is the top innovator for solar cell materials and ranks second for other solar PV components. LG leads in terms of other solar PV components, but places fifth in solar cell materials.

Within the realm of solar cell materials, there are different approaches for capturing sunlight from solar and harnessing its energy. These include organic methods, dye sensitization, the use of silicon, and other inorganics, the recent activity of which is featured in **Figure 25**. Silicon and other inorganics lead in terms of 2015 output, whereas dye-sensitized and organic methods both declined over the last year.

Companies leading in solar cell material innovation and the diversification of their portfolios across the four methods are showcased in **Figure 26**. Sharp, Mitsubishi and LG top the charts in terms of silicon-related work, whereas Kyocera, Fujifilm and Sharp are the most active with other inorganics.

Figure 25. Solar Cell Material Innovation (2010 – 2015)



Source: Derwent World Patents Index

NUCLEAR

The effectiveness of nuclear energy as a long-term source of power is often debated, especially given mass tragedies such as Chernobyl in 1986 and the Fukushima Daiichi nuclear breakdown in 2011, as well as other perceived environmental and human threats related to this power source. Nevertheless, the field continues to advance due to an increase in recent innovation activity and is becoming a more viable contender as a major source of future power.

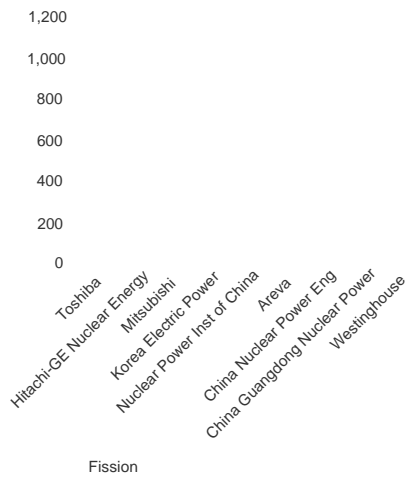
There are two main types of nuclear innovation related to energy: nuclear fission and nuclear fusion. The former has much more activity than the latter, as shown in **Figure 27**, and has been in existence and use longer.

Fission involves the process by which uranium atoms are split, releasing energy that in turn produces steam, which powers a turbine and generates electricity. Nuclear power plants can generate a lot of electricity with minimal pollution but the fission process produces radioactive waste that must be properly dealt with or it can be harmful to life and the planet.

Nuclear power is, and will continue to be, a source of electricity to large geographic regions and populations, especially if public sentiment is swayed via new inventions and technology. The more noteworthy promise, however, is with nuclear fusion, which generates electricity without the production of dangerous radioactive waste, even though it is still in the research phase and not in commercial use. Nonetheless, patenting in this area is increasing and certain subcategories related to nuclear fusion are emerging and can be identified by looking at patent filings.

Within the realm of nuclear fusion innovation, there are several different areas of







Investing in Energy

The Financial Markets as a Window on Future Sources of Energy

The oil industry has been hard-hit recently due to the confluence of factors discussed in this paper: the outcome of COP21, environmental concerns over global warming, regional turbulence in the Middle East and others. These have had a tangible impact on company performance across many sectors of energy.

When looking specifically at the Oil sector, **Table 6** shows a glimpse of its recent state, highlighting the companies that have analyst buy recommendations versus those that are a bit bearish.

Benchmark Comparisons

Recent information pulled from recommendations versus some of the top T* benchmarks (with D [B]-2 (enche B) 1(t) 21.1 (orma) 3rd, thmmen.nda

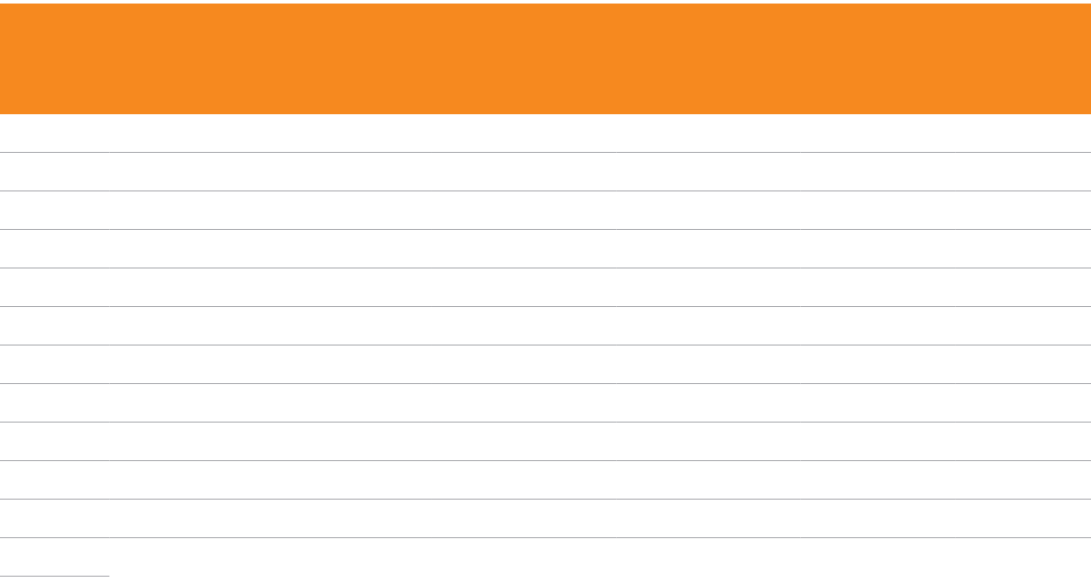
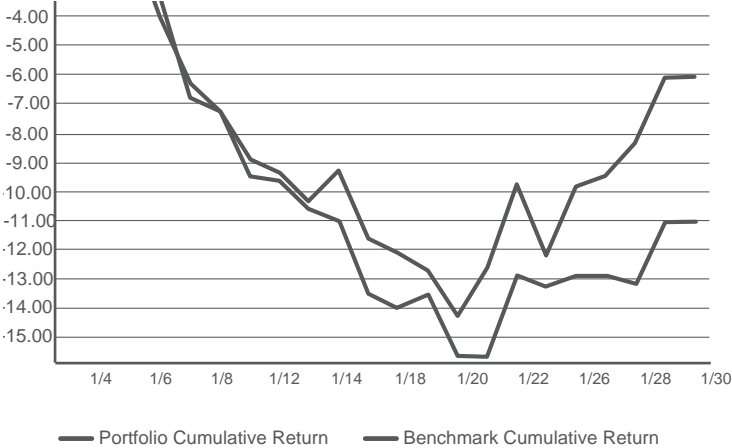


Figure 32. Comparison of Two Energy Portfolios (January 2016)



Cause-Based Investing

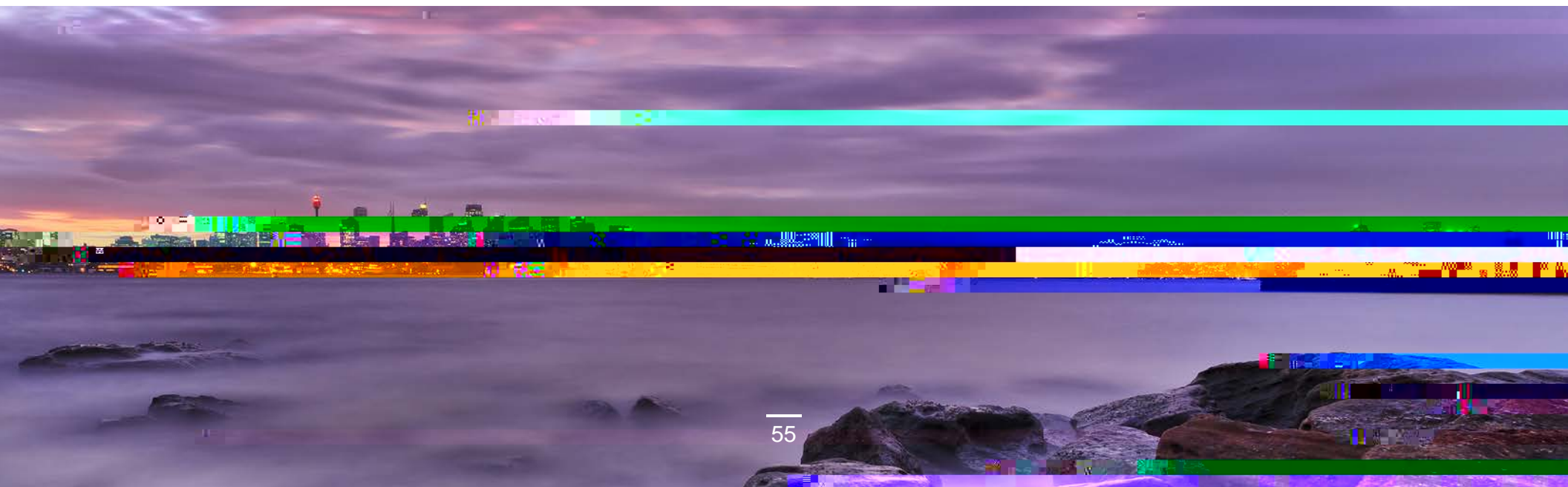
Insights from the Thomson Reuters Lipper Fund Team

The concept of socially responsible investing (SRI) can be traced back to the colonial era in the United States, when some religious groups – particularly the Methodist Church and later the Religious Society of Friends (the Quakers) – refused to invest their funds in the slave trade. However it wasn't until the 1920s that SRI took a specific form: an ecclesiastical group created the first publicly available investment fund (Pioneer Fund) to screen out tobacco, alcohol and gambling investments.

Today, SRI is often referred to as socially conscious, ethical, green, mission, religious or sustainable investing having strategies that screen out weapons manufacturers, gambling establishments, tobacco companies, abortion-related securities, pornography, etc., or that screen in best-in-class, shareholder-friendly companies. Whatever their cause, SRI investors seek two things: reasonable returns and targeting special social causes.

In recent literature on social investing, there are two fairly new terms related to responsible investing. The first is environmental, social and

Table 8. Top 5 Performing SRI Funds for the One-Year Period Ended March 31, 2015



Strategic Food for Thought

Future Considerations for Today's Business Leaders

As business leaders grapple with the challenges and opportunities ahead in the 21st century, the following are recommendations to consider related to energy strategies and how to ensure long-term success.

FINANCE

Allocate budget for renewable energy sources and consider investing in impact or ESG funds as part of your organization's investment portfolio.

Changing weather patterns and the growth of renewables will have an impact on global markets. It is imperative that business leaders have a clear understanding of these changes, and what is projected, by partnering with an experienced, trusted team to understand the ramifications of their investments on their industry and business.

Markets will liberalize in order

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