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UNIVERSITY of PENNSYLVANIA

Striking a Balance Between Valuation and Values: Investment Managers Weigh Whether Investments in a Major Oil Company and an Ethanol Producer Serve their Dual Mandate

Witold (Vit) Henisz

Vice Dean and Faculty Director, The Environmental, Social and Governance (ESG) Initiative

Deloitte & Touche Professor of Management

The Wharton School at the University of Pennsylvania

Tim Gray

Contributing Writer

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Michelle Dunstan and Jeremy Taylor, co-managers of the AllianceBernstein Global ESG Improvers Strategy, were confident their new approach would succeed—it filled a void in the market and gave them a promising path for besting competitors. Yet already they were feeling pushback from a big potential customer. It was spring 2018, and a pension fund in the Netherlands wanted to invest—but only if Dunstan and Taylor would agree to bar fossil-fuel companies, like oil producers and miners, from their investment portfolio.

That request presented a dilemma. Dunstan and Taylor saw their willingness to bet on fossil-fuel producers as a way of distinguishing themselves from other investors who considered environmental, social and governance (ESG) factors in investment decisions. Plus, Taylor had expertise in the oil-and-gas industry—an engineer by training, he'd previously been a product manager for a major petrochemical company.

Yet, the request from the Dutch pension couldn't just be dismissed. The imprimatur of an outfit like that would help AllianceBernstein persuade other investors to bet on Dunstan and Taylor. Pension managers are sophisticated investment professionals,

and their approval can signal quality to less-sophisticated folk. What's more, Europeans have long been committed to ESG investing, so a European pension's participation might be seen as a significant endorsement. Conversely, if the Dutch pension was skeptical and passed on investing, other potential customers might, too.

Dunstan and Taylor were already building out their portfolio, buying stocks they believed had the best chance to deliver excellent long-term financial results and improve their ESG performance. Now their work had become more complicated. Should they forge ahead with their belief that they should, in Dunstan's words, "invest in any industry that's necessary to the world today *and* tomorrow" or should they accede to the Dutch pension's request?¹

The decision wasn't just a philosophical one. It had immediate practical implications. Dunstan and Taylor were considering two stocks—Royal Dutch Shell, one of the world's largest oil

¹All quotations from Michelle Dunstan, Jeremy Taylor and Ted Mann are from the authors' interviews with them. The timeline of several events in the case has been altered to serve the case's pedagogical purpose. All other information is factual, drawn from interviews, media accounts and the websites of Royal Dutch Shell and Cosan.

Professor Witold J. Henisz, Deloitte & Touche Professor of Management at The Wharton School, University of Pennsylvania and Tim Gray prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. Statements and opinions expressed in this case are those of the authors. They do not express the opinions of the Wharton School, University of Pennsylvania.

Some of the values and numbers (presented in this case study) are disguised or should be considered approximates. Statements and opinions, expressed in this case, are those of the authors. They do not represent the opinions of the Wharton School, the University of Pennsylvania, Abraaj Capital, or Karachi Electric.

companies, and Cosan, a Brazilian maker of biofuels—that would test not only their process for picking ESG improvers but also their conviction in their strategy.

They believed both stocks held promise. Shell had begun to “green” its oil-and-gas-heavy operations, and Cosan was a leading producer of ethanol from sugarcane. But both also posed real risks—many ESG-oriented investors were skeptical of the ability of an “oil super major” like Shell to change and of Cosan’s corporate-governance practices.

Investing in Tomorrow’s Leaders Today

From a marketing perspective, Dunstan and Taylor’s strategy made a lot of sense. It capitalized not only on a surging trend in the money management industry—ESG investing—but also on the strengths of its parent company, AllianceBernstein.

Measured by assets under management, ESG funds remain a small part of the investment world. But during the 2010s, their growth had accelerated, with money gushing in. According to the Global Sustainable Investment Alliance, investments in so-called sustainable assets had doubled from 2012 to 2018.²

AllianceBernstein, for its part, had long been dedicated to the active management of its clients’ money, and its portfolio managers and analysts had distinguished themselves with their deep, detailed research. The investment industry was increasingly turning to passively managed products built around indexes, like the S&P 500. (An index fund is designed to match its underlying index’s performance, minus a sliver of fees.) But AllianceBernstein remained committed to digging into stocks and uncovering sources of value or potential growth that other investors overlooked. The

firm’s portfolio managers and analysts didn’t want to just match the market. They aimed to beat it.

“Our mindset is that we want to take ESG from just being a checkbox approach to being a competitive advantage of our research,” said Ali Dibadj, AllianceBernstein’s head of finance and strategy. Some ESG funds just screened out bad ESG performers, based on metrics compiled by analytics providers like MSCI and Sustainalytics. That left them with portfolios of companies that could portray as exemplary in their practices.

Unlike many competitors, Dunstan and Taylor weren’t seeking to purchase stocks of the best ESG performers. Their view was that the market appreciated and, for the most part, appropriately valued those. Rather, they wanted to identify companies with unrealized financial and ESG potential. That would distinguish their strategy from other ESG funds and, according to their research, give them the best chance to outperform. They had found that companies whose ESG performance was upgraded by the analytics companies went on to beat those whose performance was already solid but stable.³

Dunstan and Taylor also didn’t want to rule out big swaths of the economy in setting their investment criteria. They had decided to shun only a few harmful industries in defining their pool of potential stocks. “If it would be a net benefit for the world not to have a product or service, we won’t invest,” Dunstan said. “Take tobacco. If it went away tomorrow, you’d have some unhappy people and some jobs would be lost, but the world would be overall a better place. We won’t do gambling stocks, either.”

²Gabriel Karageorgiou and George Serafeim, “Why ESG Funds Fail to Scale,” Institutional Investor, Jan. 11, 2021.

³Michelle Dunstan and Jeremy Taylor, “AB Global ESG Improvers: A Case for Contrarian ESG Investing,” December 2019 PowerPoint presentation. Also: <https://www.alliancebernstein.com/library/responsible-investors-should-focus-on-esg-offenders.htm>

Some ESG funds refused to consider fossil-fuel or mining companies because of their products' contribution to climate change. As a result, many of these funds ended up looking much the same, with, for example, big slugs of technology and health care stocks. Dunstan and Taylor believed that, by doing that, the funds not only were missing out on good investments but also passing up the opportunity to help improve ESG practices in critical industries.

“Only 30 percent of the world’s oil goes into passenger vehicles, so even if you moved to 100 percent electric vehicles tomorrow, you’d still need a lot of oil,” Dunstan said. “And what powers your electrics? Mined commodities like lithium, cobalt, nickel and copper.” (Those minerals are necessary for the batteries in electric vehicles.)

Added Taylor: “Even on an aggressive path to decarbonize, oil will be here for decades to come.”

The ability of the portfolio managers to engage with companies was central to the Improvers strategy. Managers of many actively managed investment funds claim that they interact with corporate executives to encourage better ESG practices. But if a fund holds only exemplary ESG performers—Alphabet and Microsoft, for example, are common ESG holdings—there’s little room for improvement; these are, by many measures, already excellent companies. In contrast, persuading an oil super major, like Shell or Exxon Mobil, to better manage the natural gas escaping from its wells—the practice of burning off the gas, called flaring, contributes to climate change—could deliver a hefty and helpful environmental impact.⁴

Dunstan and Taylor’s approach—and that of AllianceBernstein more broadly—was to use research to show corporate managers that better ESG practices could lead to higher shareholder

value in the long run. In their view, good ESG practices were just smart management. “We always tie our engagement with the companies back to value creation for the shareholders,” Dunstan said.

Of course, corporate executives didn’t always agree with their analyses.

Great Pollution, Great Potential

Few outfits in the world offered as much potential for a positive environmental impact as Royal Dutch Shell—put differently, the Anglo-Dutch firm had much room to improve. It was the world’s ninth biggest cumulative emitter of greenhouse gases from 1988 through 2015, according to the CDP’s Carbon Majors Report 2017.⁵ Its operations were spread around the globe, from oil-and-gas wells in Nigeria and the North Sea to petrochemical plants in China and wind farms in the Netherlands. In 2018, Shell would produce 1,338 million barrels of “oil equivalent,” an industry measure combining oil and gas. The company also owned 45,000 automobile service stations in 80 countries and aviation fueling operations in 60 countries. Its 2017 annual revenue—\$305 billion—was comparable to the gross domestic product of Ireland.⁶ Its total direct greenhouse gas emissions, 73 million tons of carbon dioxide equivalent, exceeded Ireland’s.^{7,8}

⁴Hiroko Tabuchi, “Despite their Promises, Energy Giants Burn Away Vast Amounts of Natural Gas,” *The New York Times*, Oct. 16, 2019: <https://www.nytimes.com/2019/10/16/climate/natural-gas-flaring-exxon-bp.html>

⁵CDP, The Carbon Majors Database: Carbon Majors Report 2017: <https://www.cdp.net/en/articles/media/new-report-shows-just-100-companies-are-source-of-over-70-of-emissions>

⁶Countryeconomy.com, Ireland GDP: <https://countryeconomy.com/gdp/ireland?year=2017>

⁷Shell Sustainability Report 2018, “Greenhouse Gas Emissions”: <https://reports.shell.com/sustainability-report/2018/sustainable-energy-future/managing-greenhouse-gas-emissions/greenhouse-gas-emissions.html>

⁸Ireland Central Statistics Office, Environmental Indicators 2019, “Greenhouse Gas Emissions 1990–2017”: <https://www.cso.ie/en/releasesandpublications/ep/p-ei19/greenhousegasesandclimatechange/>

Like all the oil supermajors, Shell had also seen its share of environmental controversies, especially relating to its operations in the North Sea, which lapped upon the shores of the Netherlands and the United Kingdom. The North Sea contains Europe's largest oil-and-gas reserves—and was the nexus of one of Shell's biggest environmental controversies. In mid-1990s, the company announced plans to sink Brent Spar, an obsolete oil tanker loading-buoy and oil-storage tank, in the North Sea. Shell engineers had predicted that doing so would be both economical and ecologically safe, and the British government had approved. Greenpeace, the environmental group, didn't. Its activists occupied Brent Spar, and its call for a boycott of Shell led to an abrupt drop of the company's retail gasoline sales. Shell reversed course, but the dispute has been called "one of the defining moments in the modern history of corporate responsibility."⁹

Another nettle for the company was the Niger Delta in Nigeria. Shell had pioneered the oil business in Nigeria, and the country had become Africa's largest producer. Shell's operations there were both an economic boost and a flashpoint. Some Nigerians complained that most of the benefits of Shell's drilling accrued to faraway shareholders and that the oil business contributed little to their country beyond pollution. In 2011, a United Nations report criticized Shell for contributing to 50 years of pollution, in particular oil spills, in the Delta. A Dutch court later ruled that Shell could be held responsible for the area's pollution.¹⁰

Shell's massive worldwide undertaking produced not only energy, emissions and controversies but also earnings and cash. Shell's diluted 2017 earnings per share were \$1.56. Its annual dividend was steady, at \$1.88 per US-listed A share, and its indebtedness shrinking.

Under chief executive Ben van Beurden, whose tenure had begun in 2014, Shell had committed

to reduce its dependence on fossil fuels and emissions and to acquire more renewable energy assets. In 2017, it had been the first oil major to announce an intention to shrink its net carbon footprint. By the end of 2018, it would enter into an agreement with the Climate Action 100+, a group of institutional investors, including AllianceBernstein, concerned about climate change, in which it committed to halving its climate impact by 2050 and reducing it by a fifth by 2035.

But for now, Shell's fortunes remained tied to petroleum prices. A question that loomed over Shell and every oil company was what would happen to the price of oil and the value of its oil-and-gas reserves (resources owned but not yet unearthed) as worldwide efforts to address climate change accelerated. Industry experts called this the problem of "stranded assets"; the reserves would become stranded because they would never be used if the world met the goal of capping global temperature rise at 2 degrees Celsius, as stipulated in the Paris Climate Agreement. One estimate suggested that a third of global oil reserves and half of global gas reserves might become stranded if the Paris goal were met.¹¹

Shell's LNG: Bane or Boon?

Although people often speak of Shell and competitors like Exxon Mobil and BP as "oil companies," natural gas looms large in their businesses. Shell, for its part, was a leading supplier of liquefied natural gas, commonly known as LNG. It had solidified that position with a \$50 billion acquisition of BG Group, a

⁹Reuters, EC NewsDesk, "Brent Spar: Battle that Launched Modern Activism, May 5, 2010: <https://www.reutersevents.com/sustainability/business-strategy/brent-spar-battle-launched-modern-activism>

¹⁰Reuters, "Timeline: Shell's Operations in Nigeria," Sept. 23, 2018: <https://www.reuters.com/article/us-nigeria-shell-timeline-idUSKCN1M306D>

¹¹Scott Looney, "Climate Change, Stranded Assets and American Investors," *Harvard Business Law Review*, March 12, 2018: <https://www.hblr.org/2019/03/climate-change-regulation-stranded-assets-and-american-investors/>

British oil-and-gas company, in 2016.¹² BG was then the largest supplier of the LNG to the United States.¹³

Depending on whom one asked, LNG was either a bane or a boon to decarbonization efforts. Critics argued that, while cleaner burning than oil, it still produced greenhouse gases and would have to be eliminated to halt climate change. Proponents, Taylor among them, pointed out that it was essential for the climate transition, given how much cleaner burning it was than coal. When burned, coal produced about 85 percent more greenhouse gas emissions per BTU than gas did.¹⁴

“If we want to get the emerging world off coal, it’s hard to see how you do that without more gas being supplied,” he said. “Oil, coal and gas are each contributors to our energy system. If you want to CO₂ go down sharply, it’s hard to squeeze each of those really aggressively at the same time. You have to squeeze coal considerably harder than gas, with oil in between.”

Shell had bet big on LNG—it had, for example, built the world’s largest floating plant for liquefying gas, which was anchored over a gas field 125 miles off the Australian coast. But it hedged that bet by also acting as a broker in the gas market. “The big risk is owning fields and plants,” Taylor said. “Shell sells three times as much LNG as it produces.”

Those sales of other companies’ LNG foreshadowed how Taylor saw Shell adapting to a world in which it could no longer live off fossil-fuel production. The company was beginning to remake itself as an energy trader that could eventually satisfy a variety of energy needs for its vast network of business and retail customers.

On the retail side, Shell had its service stations and, partly as a result of them, a visible and well-known brand, including in the fast-growing developing world. It hoped to use that brand as a stepping-stone into new businesses, like the provision of electric-vehicle charging stations. On the business side, it had deeper relationships with customers than a typical electric or gas utility did, because it often sold customers a variety of complex products, such as oil, gas, aviation fuel, chemicals and lubricants. Adding renewably produced power and biofuels to that mix was a logical extension.

Said Taylor: “The CEO of Shell has said, ‘We aren’t going to be in the business of building wind farms and finding customers for them. We’re going to be in the business of developing customers’ demand for green energy and then sourcing that demand. Sometimes we’ll generate that energy. Sometimes we’ll source from others.’”

Taylor saw these moves as essential but only a beginning: “Climate issues are existential for oil companies. They either succeed at this, or they won’t exist.”

For Dunstan and him, the key to deciding whether to hold Shell was assessing its sustainability—in both the environmental and financial senses of that word. Could Shell remake itself into a company that wasn’t a major contributor to climate change, and could that changed firm continue to provide a steady stream of earnings growth and dividends?

¹²Sarah Kent, “Big Oil Changes Its Focus: Faced with a New Energy Landscape, Shell Bets Big on Natural Gas,” *The Wall Street Journal*, Sept. 14, 2016, R5.

¹³BG Group: <https://web.archive.org/web/20100607041706/http://www.bg-group.com/OurBusiness/OurBusiness/Pages/LNG.aspx>

¹⁴US Energy Information Administration, “How Much Carbon Dioxide is Produced When Different Fuels are Burned?”: <https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>

Powering Autos — and Earnings — with Sugarcane

Cosan, originally a Brazilian miller of sugarcane, presented a different puzzle. It too had become mainly an energy company by 2018: its mills processed sugarcane to make ethanol, a biofuel, as well as sugar, its original product. It was Brazil's leading processor of ethanol and sugar, and thus the company gave Dunstan and Taylor a way to wager on ethanol's prospects as a clean fuel and Brazil's growth. Brazilian ethanol consumption and auto usage were tightly linked.

In Brazil, cars and light trucks didn't run on gasoline alone. Under a government mandate, they ran on a mixture of gas and ethanol, typically about three-quarters gasoline and one-quarter ethanol. Those proportions could vary because Brazilian autos were equipped with engines that could burn fuel of differing mixes. That so-called flex-fuel technology was required in 2003. By 2010, 80 percent of Brazilian cars used it.¹⁵

"Ethanol is very oil-linked," said Ted Mann, an AllianceBernstein analyst who worked with Dunstan and Taylor. "Its price moves with pump prices."

Brazil was largest economy in South America by far, with a GDP of about \$2 trillion in 2017.¹⁶ The country's growth over the last several decades meant its auto fleet had swelled. Many investors bet on that growth by owning shares of Petrobras, Brazil's state-controlled oil company. But the AllianceBernstein team believed Petrobras presented political risks that made investment imprudent. The Brazilian government often meddled in the management of the company and hampered its operations, including by capping gasoline prices. "Cosan gives us similar exposures to Petrobras but with less of the risk," Mann said.

A Risk of Being Run Over

Yet Cosan presented risks of its own. The biggest might have been the person in charge—Brazilian billionaire Rubens Ometto. Ometto was a business visionary and a Machiavellian operator. He'd transformed what had started as a family-owned sugar mill into an energy conglomerate. Along the way, he brooked little opposition. As a profile in *Forbes* magazine put it: "He has built an empire out of his own fierce ambitions, and he has battled anyone who got in his way—the government, competitors and, most especially, his family."¹⁷

He'd taken a fractured family-run firm, without clear lines of authority or ownership, and turned it into a modern corporation—with him as chairman and unrivaled boss. "His combativeness," *Forbes* said, "earned him the moniker o trator—'the tractor'—which Ometto finds appropriate in light of the long legal fights with family in order to gain control of Cosan. 'I ran them all over,' he acknowledges. 'I consolidated the whole thing. I got good lawyers and moved things around.'"¹⁸

To ensure he remained in charge, Ometto had created a holding company and two classes of stock. Outside investors could own shares of one class, riding along and collecting a piece of the company's gains and dividends, but Ometto's holdings of the other ensured his control. "He created a more complex ownership structure and limited the ability of minority shareholders to exercise their rights," Mann said. "That has created an overhang on the company. It's been part of a discount associated with the stock."

¹⁵Joe Leahy and Ed Crooks, *The Financial Times*, "A sustainable sugar rush," May 11, 2012.

¹⁶The World Bank: <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD?locations=BR>

¹⁷K. Blankfeld, *Forbes*, "Sugar Daddy," March 9, 2011: <https://www.forbes.com/forbes/2011/0328/billionaires-11-profile-rubens-ometto-ethanol-sugar-daddy.html?sh=5b7b6ce27b4a>

¹⁸*Ibid.*

Companies in the developing world often have dual-class structures because, like Cosan, they were family-founded, and the founders want to protect their positions. Regulators and governance experts in the United States dislike the setup. In a 2018 white paper, the CFA Institute points out that dual-class shares make it “much easier for major shareholders to abuse their position and take advantage of public shareholders, either through massive executive compensation packages or questionable consultancy arrangements.”¹⁹ The paper also notes that, in these arrangements, controlling shareholders are typically “not incentivized to maximize the company’s potential.”²⁰ Rather than increase earnings or dividends, they may opt to divert resources to other companies they control or entrench executives, who are often their kin. Without an effective vote on major corporate questions, outside shareholders have little means of checking abuses.

Some ESG funds shy from companies with dual-class structures. But the AllianceBernstein team believed that restriction ruled out too many potential investments, especially in developing countries like Brazil. “In emerging markets, you have to invest in businesses with controlling shareholders,” Mann said. “If we didn’t, we often couldn’t invest at all. So we try to get comfortable that our interests are aligned with those of the controlling shareholder.”

Mann thought AllianceBernstein had that alignment with Cosan because Ometto didn’t have related companies to which he’d transferred assets—instead he’d consolidated everything within the holding company—and because Cosan wasn’t implicated in any corrupt dealings with Brazilian officialdom. “The nature of the business was such that it doesn’t deal with government contracts or government entities,” Mann said. Plus, Ometto was intent on generating cash to pay down the holding company’s debt, leaving less room for financial

chicanery. He also wanted to continue to expand, and expansion depended on access to the world’s capital markets. Trust, too, can be a currency.

Even so, AllianceBernstein had to remain vigilant. “You can’t forget that he has abused minority shareholders before and has the ability to do so again,” Mann added.

AllianceBernstein’s engagement with the company focused on governance, with Mann querying managers about their plans for cleaning up the corporate structure and strengthening outside stockholders’ rights. “You talk to the company and say, ‘Why did you do it, and are you going to change?’ And of course they tell you what you want to hear. They say, ‘Of course we’re going to do it, but we have to wait till the timing is right.’”

Governance concerns aside, Ometto was turning his conglomerate into what might be called a “mini-major”—an integrated energy company, with sugarcane, instead of oil, as its fuel. He had acquired service stations and aviation fueling operations. He had built a sugar export terminal and acquired a rail line to expedite the shipping of product there and to help move around Brazil’s massive agricultural output. He’d also purchased a natural gas distribution company.

Yet even with diversification, Cosan depended on ethanol, and the fuel’s fortunes were no sure bet. For one thing, in a world striving to address climate change, ethanol was, like LNG, a transitional fuel. If cars and light trucks were soon electrified, they would no longer need it.

¹⁹The CFA Institute, “Dual-Class Shares: The Good, the Bad and the Ugly,” 2018: <https://www.cfainstitute.org/-/media/documents/survey/apac-dual-class-shares-survey-report.ashx>

²⁰Ibid.

(The aviation fuel market was predicted to last longer.) What's more, though Brazilian ethanol had an appealing environmental impact, it faced ample competition. Other countries, like the United States and India, produced plenty of their own ethanol, and new formulations, like cellulosic ethanol, represented emerging alternatives. Cellulosic ethanol, made from nonedible products, like switchgrass and agricultural waste, can't yet be produced as efficiently as sugar ethanol. But some ESG investors view it as promising because its production doesn't typically crowd out food production.

The environmental efficiency of ethanol depended on the "feedstock" used to make it; the most common feedstocks were sugarcane or corn.²¹ Brazil, using mainly sugarcane, and the United States, using mainly corn, were the world's two largest producers. Sugarcane could be converted into ethanol more efficiently than corn could be, partly because waste from the cane harvest, called bagasse, was burned to power production facilities. (Bagasse is also a potential feedstock for cellulosic ethanol.)

As long as new land wasn't cleared to grow the sugarcane, Brazilian ethanol was considered to have a net zero climate-change impact: as much carbon dioxide was taken up by the cane as it grew as the fuel released when burned. Mann noted that the U.S. Environmental Protection Agency even classified Brazilian ethanol as an advanced biofuel. Research at the University of Illinois at Champaign-Urbana had predicted that it was possible to reduce worldwide carbon dioxide emissions by significantly raising Brazilian ethanol production.²²

An endorsement of Cosan's capabilities as an ethanol producer had come from none other than Royal Dutch Shell. In 2010, the two companies had entered into a 50-50 joint venture, called Raízen Energia, to produce biofuel and jointly own service stations in

Brazil.²³ The joint venture assumed ownership of Cosan's 75 percent ethanol assets and, at the outset, produced about 2 billion liters (about 528 million gallons) of ethanol annually and owned about 4,500 service stations.²⁴ (By early 2021, Raízen continued to operate as a joint venture and had grown to more than 7,000 service stations and 2.5 billion liters of ethanol production.)

Cosan's new ventures were the positive side of Ometto's drive. He wanted to expand and was willing to experiment to do so. The tractor kept plowing forward.

"He started with a modest sugarcane business, and now he has a sizable energy conglomerate," Mann said. "He's always thinking of and trying new ideas. But there's also a lot of complexity there, so how do we know he and his people are going to be good managers?"

Wagers with the Market Watching

Dunstan and Taylor couldn't know, of course. If they did, investment management wouldn't be the risky business it is. Rather, they had to make informed wagers on two companies in transition—an oil super major that wanted to become a green giant and an

emerging-market company, tightly controlled by one man, which was promising to be a better corporate citizen. While deciding about the two stocks they couldn't forget the concerns of that Dutch pension fund. Their strategy was new, and

²¹Christina Nunez, National Geographic, "Biofuels Explained": <https://www.nationalgeographic.com/environment/global-warming/biofuel/>

²²Jaiswal, D., De Souza, A.P., Larsen, S., Lebauer, D.S., Miguez, F.E., Sparovek, G., Bollero, G., Buckeridge, M.S., and Long, S. P., "Brazilian sugarcane ethanol as an expandable green alternative to crude oil use," *Nature Climate Change*, 2017, 7(11), 788–792: <https://doi.org/10.1038/nclimate3410>

²³Rogério Jelmayer, *The Wall Street Journal*, "Cosan, Shell Formalize Brazil Joint Venture," June 2, 2011.

²⁴William McNamara, *The Financial Times*, "Shell and Brazil's Cosan Plan 12bn Biofuels Joint Venture," Feb. 2, 2010.

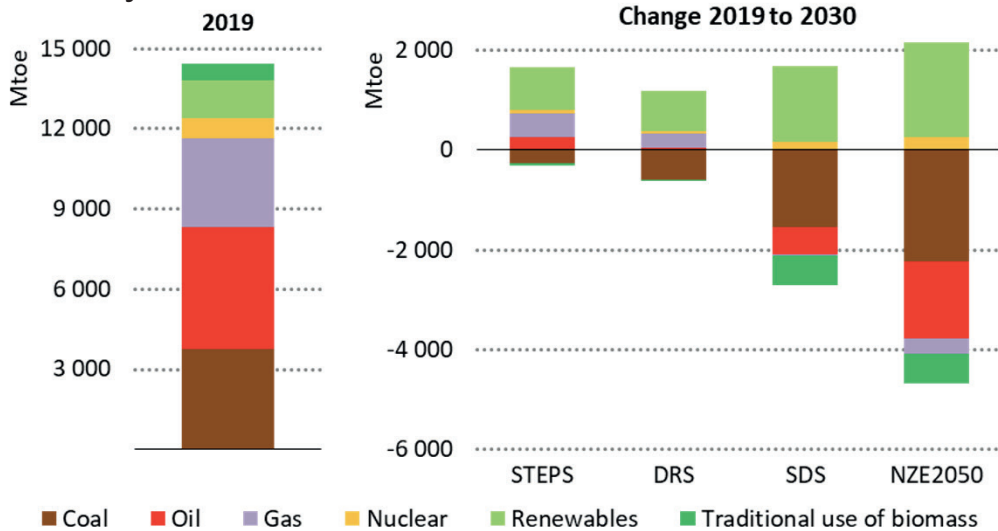
whatever choices they made would be closely watched by the market. Potential customers would want to know that their process worked—that the stocks they picked did, in fact, end up delivering improved ESG performance. No one considering an investment strategy with ESG in its name wanted to own, say, an energy company that would end up responsible for a big oil spill or an ethanol maker dragged down by allegations of self-dealing. The stocks Dunstan and Taylor picked had to show both attractive financial results and better ESG performance.

And so they were left asking themselves a variety of tough questions. Could Shell remake itself as an energy trader and renewable power peddler, and did other investors share their

belief that natural gas was a necessary transitional fuel? Were their interests aligned with those of Rubens Ometto and was he willing to improve Cosan's governance?

Would Brazilian sugar-based ethanol continue to be a widely used, or would it be pushed aside by cheaper ethanol from elsewhere or new formulations?

IEA Projections: Even Gas Shrinks if Economies shift to Net Zero



STEPS: Stated Policies
 DRS: Delayed Recovery
 SDS: Sustainable Dev't
 NZE2050: Zero in 2050

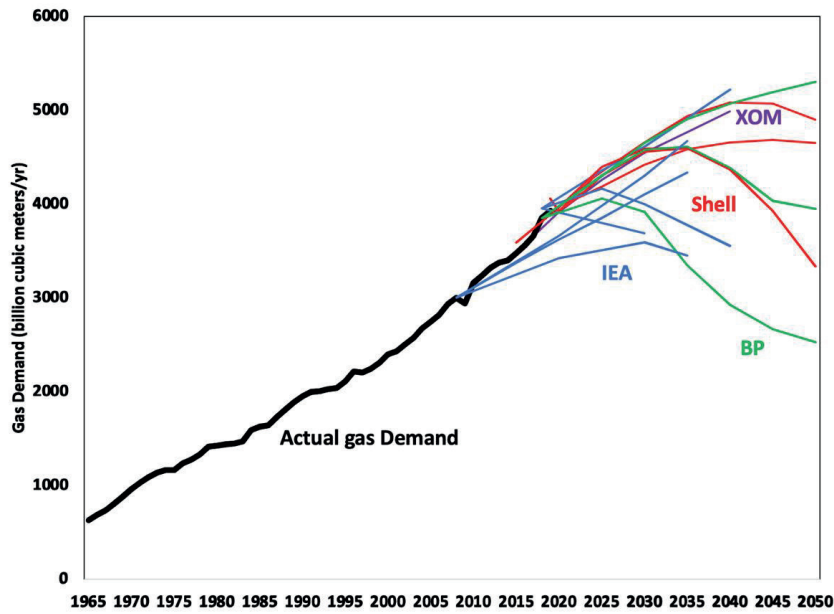


Figure 2: Future Demand for Gas. Gas has risen inexorably since the 1960s, and the history of gas forecasting has included under-estimates of future demand, including in the IEA’s 2010 World Energy Outlook (blue lines starting 2010) and ExxonMobil’s 2019 Outlook for Energy. That may now be changing as shown in projections by IEA released in 2020, Shell (2018 “sky” scenario and 2021 “waves,” “islands” and “sky 1.5” scenarios) and BP’s three projections released in 2020.ⁱⁱ

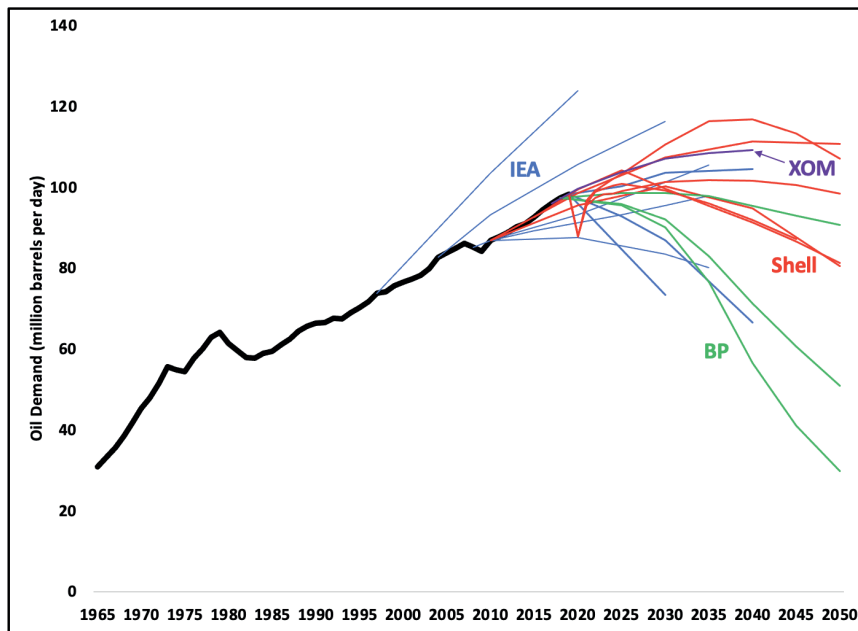
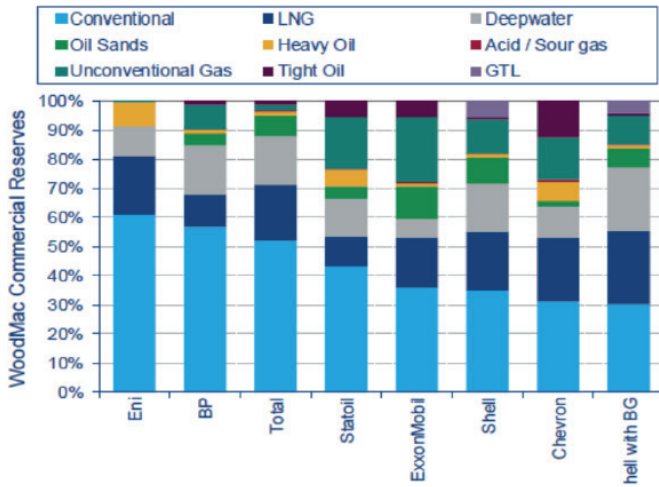
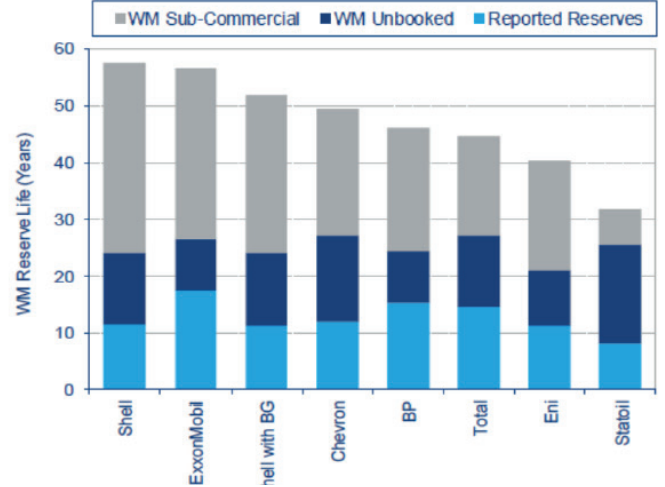


Figure 1: Rising Uncertainty around the future of oil demand. Main figure shows history of demand for oil (heavy black line) and projections (light colored lines) from four organizations: International Energy Agency (selected years, including 2020 scenarios), BP (2020 scenarios), Shell (selected years, including 2021 scenarios) and ExxonMobil (2019 Outlook for Energy). At no point in the history of oil demand forecasting has the range of possible futures been larger than today, and at no point has there been more attention to rapid declines in total demand.ⁱ

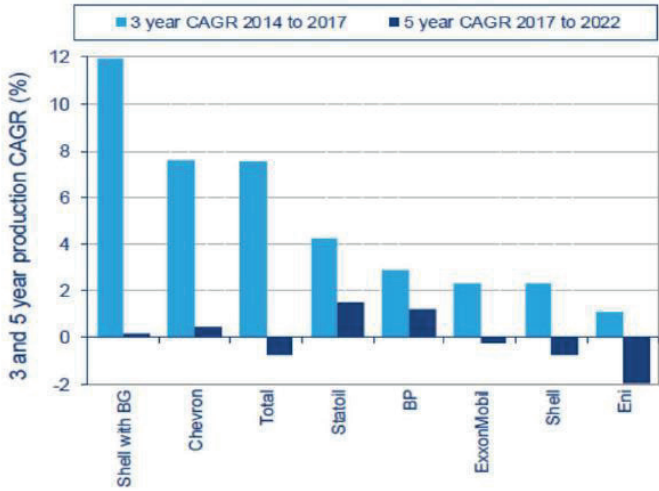
WM commercial reserves by resource theme



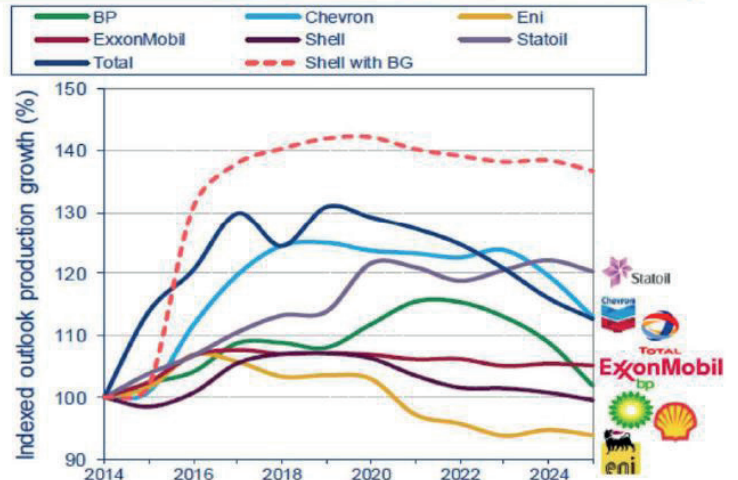
WM resource life



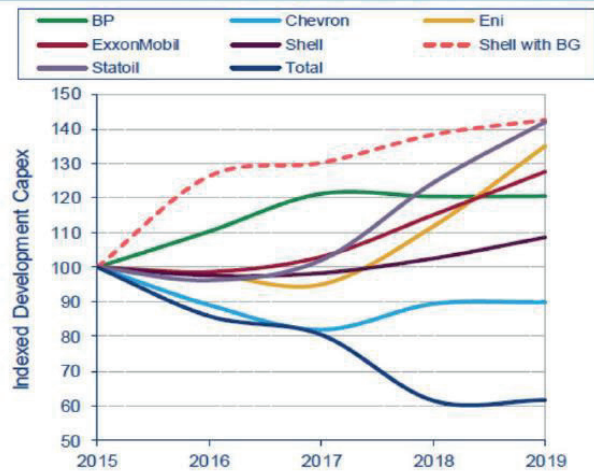
WM production growth CAGR outlook



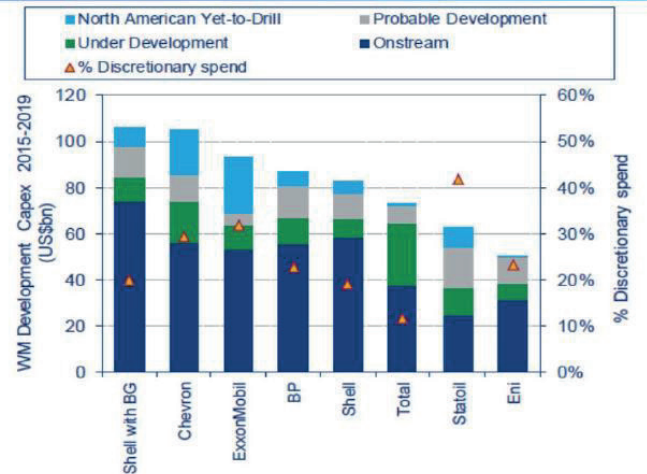
WM indexed production growth outlook



WM indexed development capex outlook



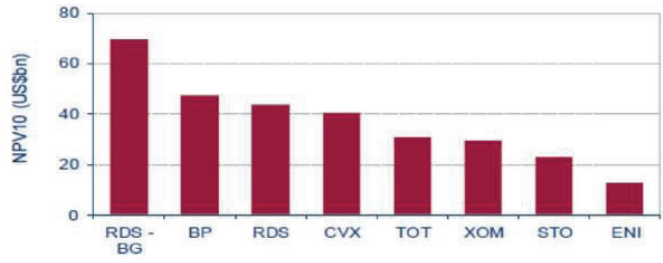
WM Capex by development status (2015-2019)



Conventional*

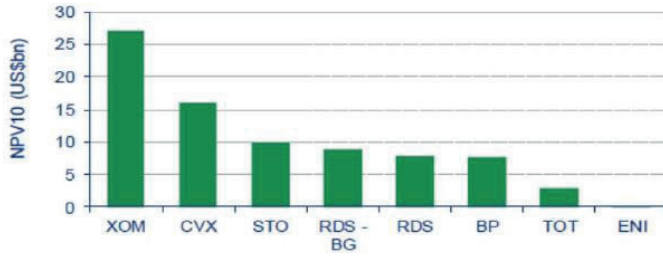


Deepwater

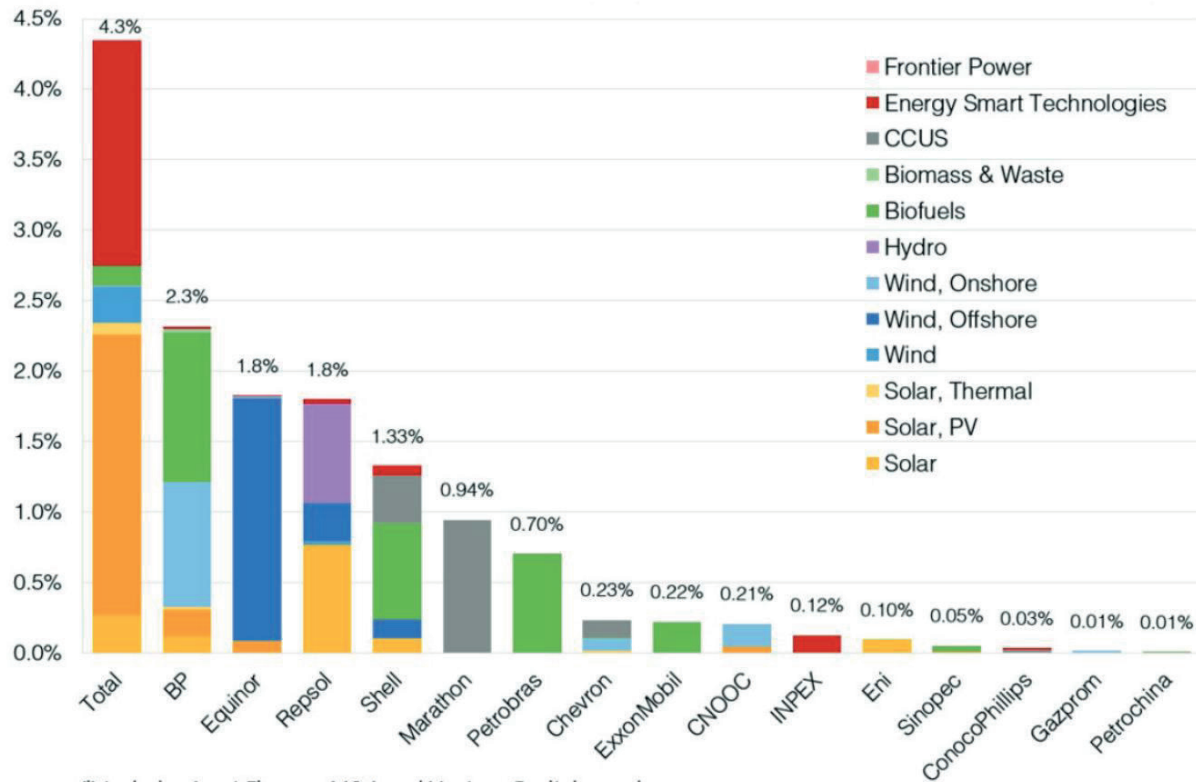
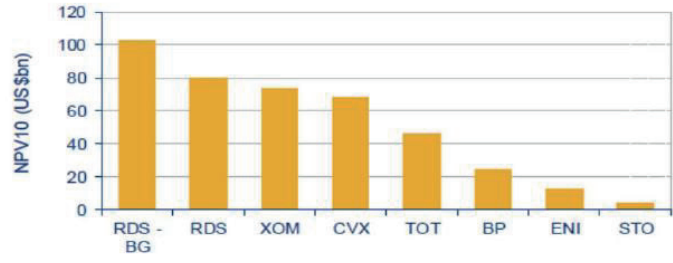


* Conventional Onshore/Offshore and Heavy Oil

Unconventional**



LNG



(i) Includes Asset Finance, M&A and Venture Capital spend.

Note: No disclosed investment for Anadarko, Apache, Hess, Noble Energy, Occidental, OMV, Rosneft and Woodside.

Source: Luke Fletcher, Tom Crocker, James Smyth, et al., Beyond the Cycle (London: CDP, 2018).

	A	B	L	Q	V	AA	BE	BJ	BO	BT	BY	CD	CI	CN	CS	CX	DC
1		Royal Dutch Shell															
2		Cash flow statement															
3																	
4																	
5																	
6		Custom case scenario															
7																	
8		Dividend cover															
9		US\$ million															
10		2006	2007	2008	2009	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	
10		35,372	36,890	40,713	20,587	24,738	23,394	34,178	47,373	35,273	21,665	29,514	35,888	42,691	43,364	43,840	
11		23,773	26,428	36,950	29,471	27,027	23,446	21,440	23,891	23,920	20,040	21,838	23,976	25,896	25,953	26,293	
12		11,599	10,462	3,763	(8,884)	(2,289)	(52)	12,738	23,482	11,353	1,625	7,677	11,912	16,795	17,412	17,546	
13			9,006	9,840	10,290	11,925	15,104	15,450	15,601	15,196	7,452	4,997	4,997	4,997	4,997	4,997	
14			116%	38%	-86%	-19%	0%	82%	151%	75%	22%	154%	238%	336%	348%	351%	
15																	
16			11,570	4,944	(8,342)	(401)	3,151	16,780	27,227	16,043	6,225	12,448	16,360	20,727	20,669	20,111	
17																	
18																	
18																	
19			26,430	25,870	35,448	18,444	11,883	17,744	24,998	38,198	35,316	18,110	19,666	25,695	32,032	32,284	32,311
20			9,069	13,150	1,750	5,839	10,888	10,422	12,577	10,764	11,916	10,769	13,119	13,547	14,099	14,609	15,147
21			(127)	(2,130)	3,515	(3,696)	1,967	(4,772)	(3,397)	(1,589)	(11,959)	(7,214)	(3,271)	(3,354)	(3,440)	(3,528)	(3,619)
22																	
23																	
24																	
24																	
25																	
25			2006	2007	2008	2009	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
26			38,727	38,697	41,698	24,673	30,128	26,587	38,019	43,708	42,900	24,726	29,514	35,888	42,691	43,364	43,840
27			35,372	36,890	40,713	20,587	24,738	23,394	34,178	47,373	35,273	21,665	29,514	35,888	42,691	43,364	43,840
28			91%	95%	98%	83%	82%	88%	90%	108%	82%	88%	100%	100%	100%	100%	100%
29																	
30																	
31			93%	104%	108%	86%	93%	96%	94%	117%	87%	88%	100%	100%	100%	100%	100%
32																	
33																	
34																	
34																	
35			2006	2007	2008	2009	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
36																	
37			3,254	11,278	(1,803)	1,326	(8,744)	(5,347)	213	7,783	16,432	(4,137)	2,414	8,794	15,505	16,822	16,999
38			12,615	13,180	13,656	14,458	26,714	24,993	27,119	22,584	29,567	26,097	27,100	27,094	27,186	26,542	26,840
39			(4,052)	(6,206)	7,935	(2,331)	5,521	(6,289)	(2,250)	3,442	6,406	8,490	-	-	-	-	-
40			19,580	16,199	23,771	7,517	4,865	4,790	7,742	16,525	(9,349)	(3,075)	-	-	-	-	-
41			31,397	34,451	43,559	20,970	28,356	18,147	32,824	50,334	42,252	27,375	29,514	35,888	42,691	43,364	43,840
42																	
43			(22,922)	(24,576)	(35,065)	(26,516)	(26,131)	(22,116)	(20,845)	(23,011)	(26,971)	(21,256)	(22,869)	(24,878)	(26,695)	(26,760)	(27,092)
44			(851)	(1,852)	(1,885)	(2,955)	(896)	(1,330)	(595)	(880)	(949)	(784)	(968)	(1,097)	(1,201)	(1,193)	(1,202)
45			1,893	9,578	6,799	2,958	4,996	3,637	10,985	5,960	6,000	3,000	4,000	4,000	4,000	4,000	4,000
46			1,019	2,280	1,236	279	(376)	(11,154)	2,426	4,272	(1,315)	(11)	-	-	(0)	-	-
47			(20,861)	(14,570)	(28,915)	(26,234)	(22,407)	(30,963)	(8,029)	(13,659)	(23,235)	(19,052)	(19,838)	(21,976)	(23,896)	(23,953)	(24,293)
48																	
49			10,536	19,881	14,644	(5,264)	5,949	(12,816)	24,795	36,675	19,017	8,324	9,677	13,912	18,795	19,412	19,546
50																	
51			2,106	1,314	4,826	10,701	14,891	11,074	(11,829)	(8,331)	19,600	4,308	(4,680)	(8,915)	(13,798)	(14,415)	(14,549)
52			(8,431)	(9,204)	(9,841)	(10,717)	(9,487)	(9,857)	(11,283)	(16,259)	(15,618)	(7,452)	(4,997)	(4,997)	(4,997)	(4,997)	(4,997)
53			(8,047)	(4,387)	(3,573)	-	(409)	-	-	(3,947)	(10,126)	(1,486)	-	-	-	-	-
54			(7,271)	(11,972)	(3,529)	(295)	272	34,530	(1,148)	(5,779)	(4,773)	-	-	-	-	-	-
55			(21,643)	(24,249)	(12,117)	(311)	5,267	35,747	(24,260)	(34,316)	(10,917)	(4,630)	(9,677)	(13,912)	(18,795)	(19,412)	(19,546)
56																	
57			178	156	(77)	106	(1,070)	(1,503)	647	(449)	(16,723)	-	-	-	-	-	-
58			(2,728)	654	5,532	(5,469)	10,145	(12,622)	1,182	6,429	(8,622)	3,693	0	0	(0)	0	0

	A	B	BE	BJ	BO	BT	BY	CD	CI	CN	CS	CX	DC
1	Royal Dutch Shell												
2	Balance sheet												
3													
4													
5													
6													
7													
8													
9	US\$ million	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	2024E	2025E	
10	Non-current assets												
11	Intangible assets	6,283	23,967	24,180	23,586	23,486	22,065	20,489	18,874	17,218	15,521	13,781	
12	Property, plant and equipment	182,838	236,098	226,380	223,175	231,679	225,375	218,720	214,119	211,284	209,199	207,190	
13	Equity-accounted investments	30,150	33,255	27,927	25,329	26,278	27,062	28,030	29,128	30,329	31,522	32,724	
14	Investments in securities	3,416	5,952	7,222	3,074	2,989	2,884	2,884	2,884	2,884	2,884	2,884	
15	Deferred tax	11,033	14,425	13,791	12,097	10,524	10,706	10,706	10,706	10,706	10,706	10,706	
16	Pre-paid pension costs	4,362	1,456	2,799	6,051	4,717	8,352	8,352	8,352	8,352	8,352	8,352	
17	Trade and other receivables	8,717	9,553	9,394	7,826	8,085	7,871	7,871	7,871	7,871	7,871	7,871	
18	Derivative financial instruments				574	689	1,212	1,212	1,212	1,212	1,212	1,212	
19		246,799	324,706	311,693	301,712	308,447	305,527	298,264	293,146	289,856	287,267	284,720	
20	Current assets												
21	Inventories	15,822	21,775	25,223	21,117	24,071	13,897	13,897	13,897	13,897	13,897	13,897	
22	Trade and other receivables	45,784	45,664	49,869	42,431	43,414	36,798	36,798	36,798	36,798	36,798	36,798	
23	Derivative financial instruments				7,193	7,149	12,467	12,467	12,467	12,467	12,467	12,467	
24	Cash and cash equivalents	31,752	19,130	20,312	26,741	18,055	21,812	21,812	21,812	21,812	21,812	21,812	
25		93,358	86,569	95,404	97,482	92,689	84,974	84,974	84,974	84,974	84,974	84,974	
26													
27	Total assets	340,157	411,275	407,097	399,194	401,136	390,501	383,238	378,120	374,830	372,241	369,694	
28													
29	Non-current liabilities												
30	Debt	52,849	82,992	73,870	66,690	81,360	83,548	80,038	73,352	63,003	52,192	41,280	
31	Deferred tax	8,976	15,274	13,007	14,837	2,342	2,705	2,705	2,705	2,705	2,705	2,705	
32	Retirement benefit obligations	12,587	14,130	13,247	11,653	1,209	1,807	1,807	1,807	1,807	1,807	1,807	
33	Decommissioning and other provisions	26,148	29,618	24,966	21,533	14,522	15,084	15,084	15,084	15,084	15,084	15,084	
34	Trade and other payables	4,528	6,925	4,428	2,735	13,017	13,884	13,884	13,884	13,884	13,884	13,884	
35	Derivative financial instruments				1,399	21,799	21,562	21,562	21,562	21,562	21,562	21,562	
36		105,088	148,939	129,518	118,847	134,249	138,590	135,080	128,394	118,045	107,234	96,322	
37	Current liabilities												
38	Debt	5,530	9,484	11,795	10,134	15,064	17,184	16,014	13,785	10,335	6,732	3,094	
39	Trade and other payables	52,770	53,417	56,663	48,888	49,208	39,441	39,441	39,441	39,441	39,441	39,441	
40	Derivative financial instruments				7,184	5,429	10,785	10,785	10,785	10,785	10,785	10,785	
41	Taxes payable	8,233	6,685	7,250	7,497	6,693	7,079	7,079	7,079	7,079	7,079	7,079	
42	Retirement benefit obligations	350	455	594	451	419	402	402	402	402	402	402	
43	Decommissioning and other provisions	4,065	3,784	3,465	3,659	2,811	2,769	2,769	2,769	2,769	2,769	2,769	
44		70,948	73,825	79,767	77,813	79,624	77,660	76,490	74,261	70,811	67,208	63,570	
45	Equity												
46	Equity attributable to Royal Dutch Shell plc shareholders	162,876	186,646	194,356	198,646	186,476	170,511	167,928	171,725	182,233	194,059	206,061	
47	Non-controlling interest	1,245	1,865	3,456	3,888	3,987	3,740	3,740	3,740	3,740	3,740	3,740	
48		164,121	188,511	197,812	202,534	187,326	174,251	171,668	175,465	185,973	197,799	209,801	
49													
50	Total liabilities and equity	340,157	411,275	407,097	399,194	401,199	390,501	383,238	378,120	374,830	372,241	369,694	
51	Check	-	-	-	-	(63.8)	-	-	-	-	-	-	
52													
53													
54	Gearing												
55	US\$ million	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	
56	Gross debt	58,379	92,476	85,665	76,824	96,424	100,732	96,052	87,136	73,339	58,924	44,374	
57	Net debt	26,627	73,346	65,353	50,083	75,169	78,920	74,240	65,324	51,527	37,112	22,562	
58	Net debt to equity	16%	39%	33%	25%	40%	45%	43%	37%	28%	19%	11%	
59	Net debt to net debt+equity	14.0%	28.0%	24.8%	19.8%	28.6%	31.2%	30.2%	27.1%	21.7%	15.8%	9.7%	
60													
61	Net debt to EBITDA	0.89	2.31	1.40	0.87	1.34	3.15	2.17	1.48	0.95	0.68	0.42	
62	Net debt to CFFO	1.08	3.14	1.91	1.06	2.13	3.64	2.52	1.82	1.21	0.86	0.51	
63	EBITDA interest cover	16	10	12	15	12	5	7	10	14	17	21	

TRADING MULTIPLES	PB	PE15	EV/DACF (x) 15	5 yr ROE%	DVD yield	CoE	RoE/CoE	PB/(RoE/COE)	Price
BG	1.85	39	8.9	15.4%	1.9%	15%	1.03	1.80	10.95
BP	1.04	18	4.6	13.8%	7.4%	11%	1.23	0.84	4.02
ENI	0.90	33	4.8	9.9%	6.2%	12%	0.80	1.12	15.48
RDS	1.01	14	5.7	13.6%	6.7%	9%	1.46	0.69	18.36
Statoil	1.28	20	2.9	16.8%	5.0%	15%	1.14	1.13	142.9
Total	1.27	13	6.6	15.4%	5.4%	11%	1.44	0.88	45
	1.23	23	5.6	14.2%	5.4%	12%	1.18	1.08	
FORECASTS	BASE PNE	BASE FCF%	BASE CF Balance	ROCE	STRESS PNE	STRESS FCF%	STRESS CF BALANCE	ROCE	
BG	8.4	9.4%	2017	19.6%	11.2	7.4%	2017	15.0%	
BP	9.3	10.5%	2018	7.4%	12.9	7.4%	2019	5.5%	
ENI	12.6	8.5%	2018	13.4%	18.2	6.5%	2018	9.8%	
RDS	8.5	10.7%	2018	9.8%	11.3	8.4%	2018	7.6%	
Statoil	8.3	7.3%	2018	8.8%	10.8	4.4%	2020	6.7%	
Total	7.9	9.9%	2017	8.6%	9.8	8.0%	2017	7.0%	
	9.2	9.4%		11.3%	12.3	7.0%		8.6%	
RDS/BG	7.4	12.0%	2017						

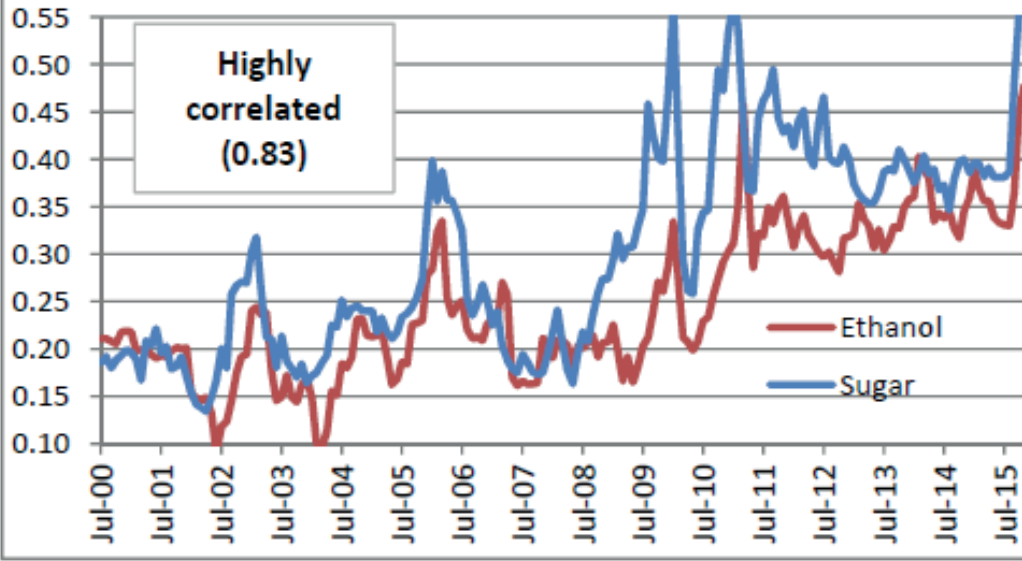
ESG/Socially Responsible Investing

MSCI ESG Score Card

ESG RATING **A**

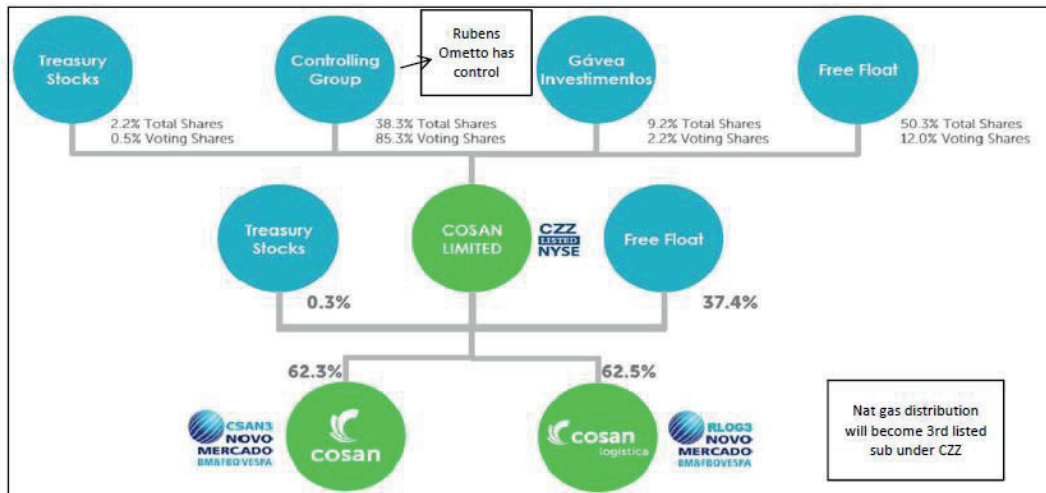
	WEIGHT	SCORE	QUARTILE
Environment	48.0%	4.9	
Biodiversity & Land Usage	16.0%	2.7	●
Carbon Emission	16.0%	6.8	● ● ●
Toxic Emission and Waste	16.0%	5.2	● ● ● ●
Water Stress	0.0%	7.7	● ● ●
Social	16.0%	5.5	
Health & Safety	16.0%	5.5	● ●
Human Capital Development	0.0%	5.8	● ● ● ●
Labor Management	0.0%	5.3	● ●
Privacy and Data Security	0.0%	10.0	● ● ● ●
Governance	36.0%	6.4	
Corruption & Instability	20.0%	4.5	● ● ●
Corporate Governance	16.0%	8.8	● ● ● ●

Sugar and Ethanol Prices (BRL/lb of sugar equiv.)



	AB	C	D	H	I	J	N	S	T	U	W	X	Y	Z	AC	AD	AE	AH	AI
1	Global Comps: Sugar & Ethanol, Fuel Distribution, Utilities																		
2			Mkt	Free		PE Ratio			Other Metrics										
3			Cap	Float	ADV	Consensus					EV/	EBIT	Asset					ND/	Div.
4			US\$ Bn	%	\$M/day	2015	2016	2017	P/B	EV/S	EBITDA	Margin	Turns	ROE	ROA	EBITDA	Yield		
5																			
6	Brazil Sugar & Ethanol																		
7	Cosan (CSAN3)	BZ	2.7	37%	9.1	31.1 x	14.8 x	9.8 x	1.2 x	2.6 x	5.0 x	10.9%	0.27 x	-1%	0%	4.8 x	2.9%		
8	Cosan (CZZ)	BZ	1.0	94%	4.9	15.3 x	5.8 x	3.8 x	0.6 x	3.0 x	6.8 x	11.9%	0.26 x	0%	0%	6.8 x	3.0%		
9	Sao Martinho	BZ	1.4	43%	2.9	13.3 x	10.4 x	10.4 x	2.1 x	3.5 x	6.5 x	22.1%	0.30 x	7%	2%	3.0 x	1.3%		
10	Adecoagro	LX	1.3	78%	2.4	40.1 x	18.6 x	25.0 x	1.9 x	2.5 x	8.6 x	12.1%	0.41 x	2%	1%	3.2 x	n/a		
11	Biosev	BZ	0.3	15%	0.0	n/a	n/a	n/a	1.9 x	n/a	n/a	10.3%	0.46 x	-48%	-5%	2.8 x	n/a		
12	Tereos	BZ	0.1	30%	0.1	5.3 x	3.2 x	3.2 x	0.1 x	0.7 x	6.2 x	0.4%	0.67 x	-4%	-1%	5.2 x	n/a		
13	Cap-weighted avg					25.2 x	12.5 x	11.4 x	1.4 x	2.7 x	6.1 x	13.4%	0.32 x	-1%	0%	4.4 x	1.9%		
14	Other Sugar & Ethanol																		
15	Bunge	US	10.1	99%	68.2	13.4 x	11.0 x	9.6 x	1.7 x	0.3 x	7.4 x	1.6%	2.14 x	7%	3%	2.3 x	2.0%		
16	Suedzucker	GE	3.9	44%	11.8	57.9 x	42.8 x	26.3 x	0.9 x	0.6 x	9.9 x	1.9%	0.85 x	0%	0%	1.4 x	1.4%		
17	Tongaat Hulett	SA	1.1	74%	1.2	11.0 x	8.6 x	8.6 x	1.3 x	1.5 x	7.8 x	12.6%	0.64 x	9%	4%	1.8 x	3.3%		
18	Green Plains	US	0.8	93%	19.0	42.4 x	14.6 x	10.3 x	1.0 x	0.3 x	6.7 x	8.8%	1.70 x	7%	3%	-0.4 x	1.7%		
19	MSM Malaysia	MA	0.8	12%	0.1	12.4 x	12.2 x	12.2 x	1.7 x	1.6 x	8.2 x	14.4%	0.95 x	14%	11%	0.3 x	2.8%		
20	Illovo Sugar	SA	0.6	44%	0.9	14.3 x	10.7 x	10.7 x	1.3 x	1.1 x	7.5 x	12.4%	0.93 x	13%	6%	n/a	5.0%		
21	Cosumar	MO	0.7	28%	0.4	9.4 x	9.0 x	n/a	2.0 x	1.7 x	n/a	16.6%	0.69 x	18%	7%	1.3 x	6.0%		
22	Khon Kaen Sugar	TH	0.5	34%	0.2	13.3 x	11.3 x	12.8 x	1.4 x	2.2 x	15.9 x	12.0%	0.44 x	10%	3%	8.2 x	1.4%		
23	Mitsui Sugar	JN	0.6	55%	1.1	n/a	n/a	n/a	1.0 x	0.7 x	n/a	4.0%	0.97 x	10%	6%	-0.1 x	2.3%		
24	REX American Resour	US	0.4	82%	9.7	2.4 x	16.5 x	10.3 x	1.3 x	0.6 x	n/a	21.4%	1.08 x	20%	14%	-1.5 x	n/a		
31	Cap-weighted avg					22.5 x	17.0 x	12.5 x	1.5 x	0.6 x	7.5 x	4.8%	1.54 x	7%	3%	1.8 x	2.2%		
32	Global Fuel Distribution																		
33	Ultrapar	BZ	9.9	61%	26.6	21.4 x	17.8 x	17.8 x	4.6 x	0.6 x	11.4 x	3.4%	3.71 x	18%	7%	1.5 x	2.2%		
34	Couche-Tard	CA	25.5	96%	60.2	33.3 x	28.7 x	25.9 x	6.1 x	0.8 x	12.5 x	3.8%	3.18 x	23%	9%	1.2 x	0.3%		
35	Casey's	US	4.5	99%	42.9	25.7 x	23.2 x	21.2 x	4.8 x	0.6 x	10.4 x	4.2%	3.05 x	23%	8%	1.6 x	0.7%		
36	CST Brands	US	2.8	95%	23.4	19.8 x	20.8 x	19.1 x	3.2 x	0.3 x	9.2 x	2.6%	3.84 x	28%	7%	1.7 x	0.7%		
37	The Pantry	US	n/a	95%	n/a	n/a	n/a	n/a	n/a	0.2 x	n/a	1.4%	4.35 x	11%	2%	3.2 x	n/a		
38	Susser	US	n/a	95%	n/a	n/a	n/a	n/a	n/a	0.2 x	n/a	1.4%	4.35 x	11%	2%	3.2 x	n/a		
39	Cap-weighted avg					28.9 x	25.1 x	23.1 x	5.4 x	0.7 x	11.8 x	3.7%	3.33 x	22%	8%	1.3 x	0.8%		
40	Brazil Utilities Discos																		
41	Comgas	BZ	1.2	83%	0.2	10.0 x	7.7 x	7.4 x	1.5 x	1.1 x	4.3 x	16.4%	0.83 x	19%	8%	1.3 x	9.9%		
42	CPFL Energia	BZ	4.1	36%	6.3	16.9 x	13.3 x	10.6 x	2.2 x	1.9 x	9.5 x	14.7%	0.57 x	13%	3%	4.3 x	n/a		
43	Sabesp	BZ	3.2	50%	6.0	13.6 x	10.4 x	5.5 x	0.9 x	2.0 x	6.6 x	17.1%	0.36 x	6%	3%	3.0 x	1.8%		
44	Equatorial	BZ	1.9	95%	18.9	10.6 x	10.9 x	8.2 x	2.1 x	1.2 x	9.8 x	14.8%	0.70 x	40%	11%	1.0 x	2.0%		
45	Light	BZ	0.7	38%	2.8	9.4 x	5.7 x	4.7 x	0.7 x	1.0 x	6.7 x	13.7%	0.79 x	15%	4%	4.2 x	5.8%		
46	Cap-weighted avg					13.6 x	11.0 x	8.0 x	1.6 x	1.6 x	8.0 x	15.5%	0.58 x	16%	5%	3.0 x	2.3%		
47																			
48	Cosan Logistica	BZ	0.1	37%	0.3	9.2 x	3.0 x	6.5 x	0.5 x	2.4 x	0.9 x	24.6%	n/a	n/a	n/a	2.2 x	5.3%		

Corporate Structure: limited minority control and high complexity warrant a discount

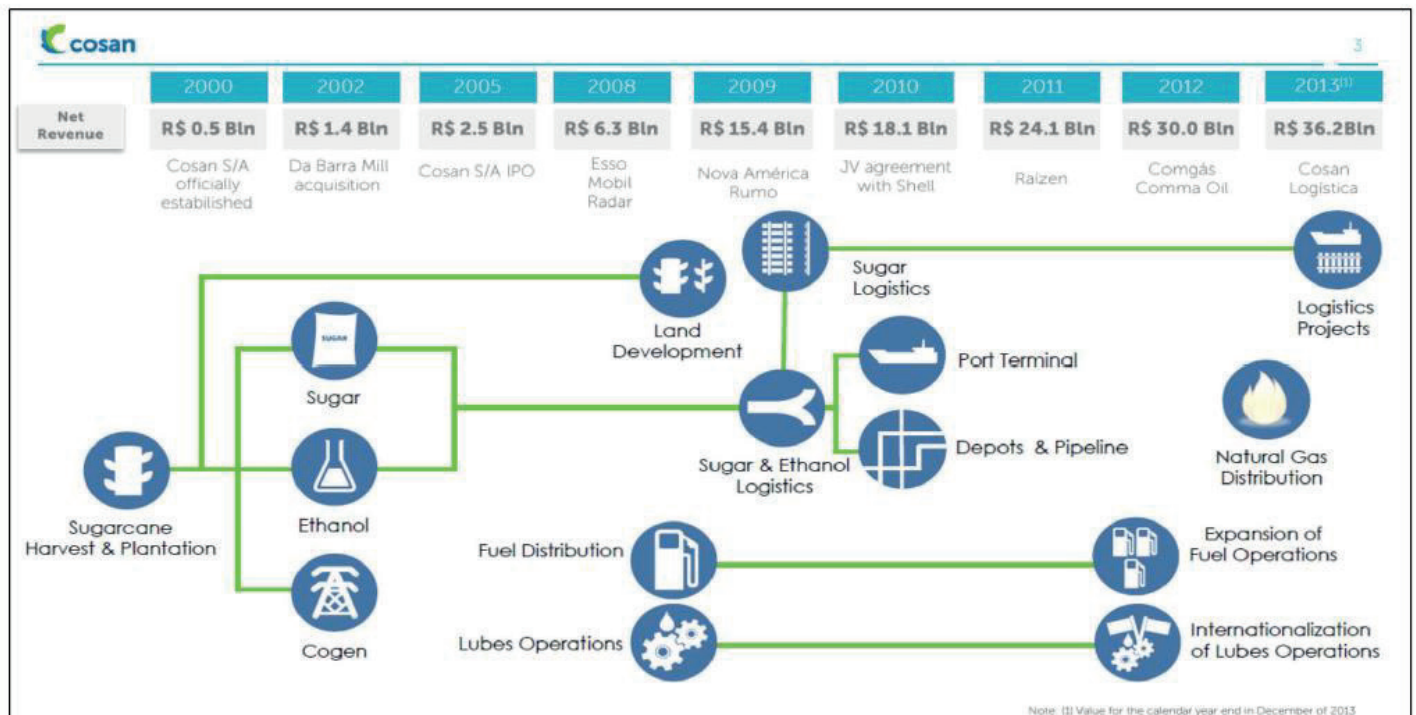
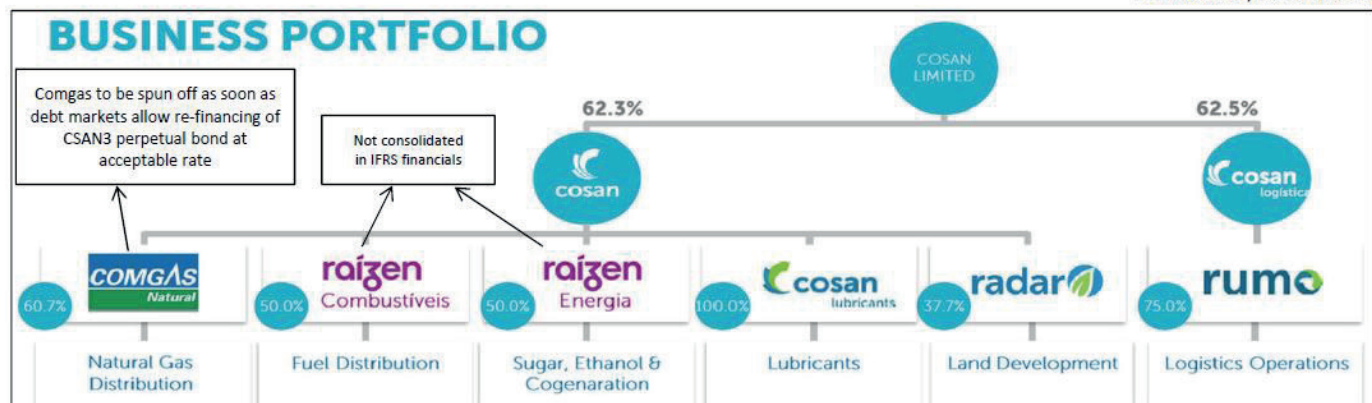


Corp Governance concerns:

1. CZC listing showed clear disregard for minorities, who now lack control --> Ometto has long track record of fighting partners for control
2. Potential conflicts of interest between multiple listings

AB view:

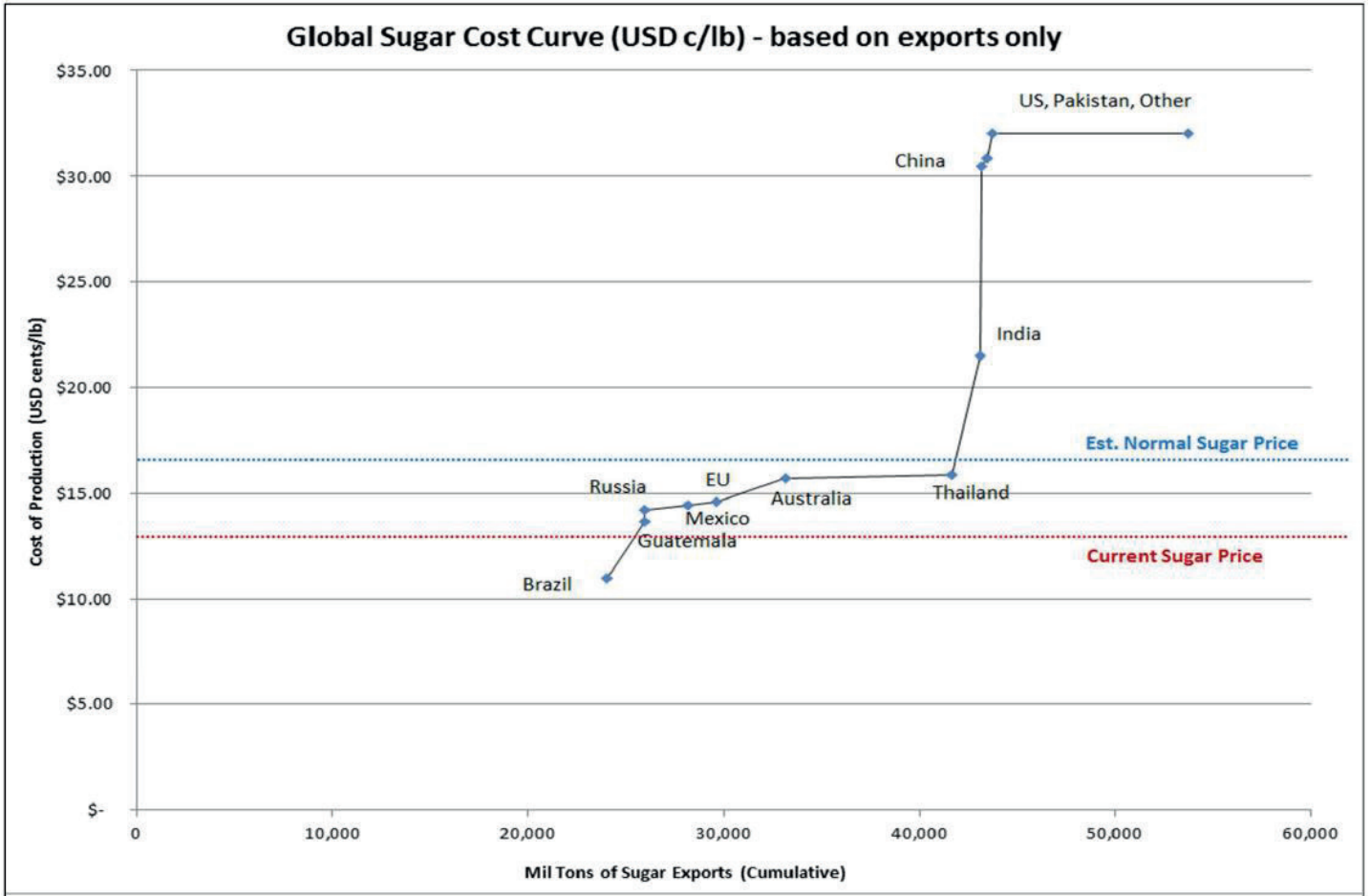
1. Status quo of Ometto control unlikely to change
2. Lower risk that minorities are unambiguously hurt further
3. Risk is being Ometto's partner in new deals; more risk at CZC



	A	B	C	D	E	F	G	H	I	J	K
1	Sum of Parts Analysis: healthy upside even w/ holdco discount										
2	<i>All figures in R\$ millions unless otherwise stated</i>										
3											
4											
5											
6		2015E	EV/EBITDA	Total	Net	Equity	CSAN3	CSAN3	CSAN3		
7	CSAN3	EBITDA	Multiple	Value	Debt	Value	Stake	Equity	Mix	Notes	
8	Raízen Combustíveis	2,350	11.0x	25,850	-1,712	24,138	50%	12,069	84%	Compares to Ultrapar 11.5x	
9	Raízen Energia	2,850	6.0x	17,100	-8,590	8,510	50%	4,255	30%	Compares to SMT03 6.5x	
10	Comgás (CGAS5)	1,400	4.6x	6,485	-1,778	4,707	61%	2,857	20%	Listed --> market data	
11	Lubricants	145	9.0x	1,305	-369	936	100%	936	7%	2014 was depressed	
12	Radar	130	20.7x	2,685	1	2,686	37%	994	7%	Land; valued @ 1x book	
13	Corporate/others	-270	7.8x	-2,102	-4,679	-6,781	100%	-6,781	-47%		
15	Total CSAN3 (consol.)	6,606	7.8x	51,322	-17,127	34,195	42%	14,329	100%	100% of everything	
16	Current market cap (\$R mm)							10,396			
17	Upside/(Downside)							38%			
18	Upside w/ 15% holdco discount							17%		Discount for limited control	
19											
20											
21	CSAN3 Upside Sensitivity Analysis:			Combustíveis EV/EBITDA multiple							
22				9.0x	11.0x	13.0x		Key Variables:			
23		Valuation	5%	9%	31%	52%		-Combustíveis multiple			
24		Discount	15%	-2%	17%	36%		-Holdco valuation discounts			
25			25%	-14%	3%	20%					
26											

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Brazil's Dominant Role in Sugar Trade Means Its Supply Drives the Price																							
2																								
3	2014/15E Global Sugar Production, Consumption, and Trade, from USDA:																							
4																								
5	Sugar Production					Sugar Consumption					Sugar Exports					Sugar Imports								
6	Country	#	MT (000s)	Share	5Y cagr	Country	#	MT (000s)	Share	5Y cagr	Kg/Cap	Country	#	MT (000s)	Share	5Y cagr	Country	#	MT (000s)	Share				
7	Brazil	1	35,800	21%	0%	India	1	27,000	16%	4%	22	Brazil	1	24,000	45%	0%	China	1	3,800	7%				
8	India	2	27,250	16%	6%	EU-27	2	18,500	11%	1%	36	Thailand	2	8,500	16%	12%	EU-27	2	3,500	7%				
9	EU-27	3	16,300	9%	-1%	China	3	17,400	10%	4%	13	Australia	3	3,500	7%	-1%	US	3	3,149	6%				
10	China	4	13,300	8%	3%	Brazil	4	11,500	7%	-1%	57	Mexico	4	2,158	4%	24%	Russia	4	1,500	3%				
11	Thailand	5	10,200	6%	8%	US	5	10,881	6%	2%	34	Guatem.	5	1,950	4%	1%	Japan	5	1,415	3%				
12	US	6	7,677	4%	1%	Russia	6	5,810	3%	0%	41	EU-27	6	1,500	3%	-11%	Canada	6	1,300	3%				
13	Mexico	7	6,508	4%	5%	Mexico	7	4,860	3%	0%	40	India	7	1,500	3%	46%	Egypt	7	1,220	2%				
14	Pakistan	8	4,700	3%	7%	Pakistan	8	4,500	3%	2%	23	Cuba	8	850	2%	10%	India	8	1,000	2%				
15	Australia	9	4,600	3%	0%	Egypt	9	2,910	2%	2%	33	Colombia	9	800	1%	-2%	Colombia	9	330	1%				
16	Russia	10	4,200	2%	4%	Thailand	10	2,700	2%	4%	40	S. Africa	10	800	1%	1%	S. Africa	10	320	1%				
17	Other		41,923	24%	3%	Other		65,868	38%	2%	22	Other		8,139	15%	1%	Other		34,229	66%				
18	World		172,458	100%	2%	World		171,929	100%	2%	24	World		53,697	100%	2%	World		51,763	100%				
19																								
20																								
21	Share of World Sugar Production												Share of World Sugar Exports											
22																								
23																								
24																								
25																								
26																								
27																								
28																								
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32																								
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34																								

Global Sugar Cost Curve (USD c/lb) - based on exports only



1	Cosan is biggest S&E producer, w/ higher unit costs and more variable costs than Sao Martinho											
2												
3	-Cosan crushes twice as much sugarcane as nearest peer...						... but its mills are spread out and in some areas w/ lower agricultural productivity...					
4	--> biggest S&E producer in Brazil and the world											
5												
6							--CSAN S&E footprint					
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19	... leading to average profitability which lags industry benchmark Sao Martinho											
20												
21		Cane	Crushing	Agricultural	Co-gen	Mix of						
22		Crushed	Capacity	Yield	Energy	3rd-Party	EBIT	Asset				
23		Mil. Tons	Utiliz.	TRS/Hectare	Sales mix	Cane	Margin	Turnover	ROE			
24	Cosan	57.1	85%	9,949	6.2%	49%	5%	0.42x	0%			
25	Biosev	28.3	78%	8,687	8.0%	40%	10%	0.46x	-48%			
26	Tereos	19.5	87%	11,644	10.8%	n/a	0%	0.67x	-4%			
27	Sao Martinho	18.7	94%	12,404	8.1%	34%	22%	0.30x	7%			
28												
29												
30	High utilization of crushing capacity is key for leveraging fixed costs of mills			High yields lead to lower unit costs			Co-generation is high incremental margin			Leverage to S&E prices: (-) Higher variable costs from 3rd party cane (+) Higher unit costs		
31												
32												
33												
34	--> Cosan would like to eventually divest the capital-intensive sugarcane operation and become a pure miller (asset-light but low-margin)											
35												

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CBI Data [RiskMetrics] - COSAN SA INDUSTRIA COMERCIO As Of: 5/4/2015

Item	State	Criteria	Update Date	Revenue Percentage
Alcohol	●	Companies involved in the Alcohol industry as a producer, distributor, retailer, licensor, supplier, or ownership issues.	04-May-2015	Percentage of revenue associated with this item: 0.99

ESG Details [GHI] - COSAN SA INDUSTRIA COMERCIO As Of: 5/4/2015

Factor	Global		Home		Sector	
	Score	Percentile	Score	Percentile	Score	Percentile
ESG Total	D	19	D	21	D	24
Environment	D	23	C	31	C	37
Social	B	89	B	94	B	95
Governance	D	15	D	15	D	14
- Board	C	67	B	78	C	62
- Pay	D	22	C	42	D	19
- Ownership	D	8	D	7	D	6
- Accounting	F	5	F	4	D	9

Classification [Reuters]

Home Market: Emerging Markets | Sector: Energy

ESG Rating

A (Superior) 96-100
B (Above Average) 76-95
C (Average) 26-75
D (Below Average) 6-25
F (Falling) 1-5

Board isn't ideal, but OK vs peers

Control is the main problem

Low score for accounting is due to low asset turns and high intangibles, but these are not independently indicative of weak governance

Engagement Template	GMI website	Detailed Report
Governance - Board	Governance - Pay	Governance - Ownership & Control
<ul style="list-style-type: none"> Independent Board Majority ● Executives on Board ● Independent Chair ● Independent Lead Director ● Audit Committee Independence ● Comp Committee Independence ● Gender Diversity ● Risk Management Expertise ● 	<ul style="list-style-type: none"> Performance Targets ● CEO Equity Policy ● Director Equity Policy ● Executive Pay Disclosure ● Clawbacks ● 	<ul style="list-style-type: none"> Controlling Shareholder ● Controlling Shareholder Concerns ● Proxy Access ● Fair Price Provision or Protection ● Shareholder Action by Written Consent ● Say on Pay Policy ● Confidential Voting ●
Governance - Accounting	Environment	Social
<ul style="list-style-type: none"> Revenue Recognition ● Asset-Liability Valuation ● 	<ul style="list-style-type: none"> High Environmental Impact Company ● Supply Chain Impact ● Water Use Reporting ● Impact Reduction Targets ● 	<ul style="list-style-type: none"> High Social Impact Company ● Sustainability Board Oversight ● Sustainability Reporting Framework ● UN Global Compact ●

NAME	POSITION	POSITION YEAR ELECTED	END OF TERM
Rubens Onetto Silveira Mello	Chairman of the Board	04/30/2015	04/29/2018
Marcos Marinho Lutz	Vice-Chairman	04/30/2015	04/29/2017
Marcelo Eduardo Martins	Board Member	04/30/2014	04/29/2016
Serge Versano	Independent Board Member	04/30/2015	04/29/2018
Burkhard Otto Cordes	Board Member	04/30/2015	04/29/2018
Marcelo de Souza Scarscela Portela	Board Member	04/30/2015	04/29/2018
Dan Isachke	Independent Board Member	04/30/2015	04/29/2018

STATEMENT OF CASH FLOWS - CZZ CONSOLIDATED (IN \$ MILION)	1Q13 (Jan-Mar)	2Q13 (Apr-Jun)	3Q13 (Jul-Sep)	4Q13 (Oct-Dec)	1Q14 (Jan-Mar)	2Q14 (Apr-Jun)	3Q14 (Jul-Sep)	4Q14 (Oct-Dec)	1Q15 (Jan-Mar)	2Q15 (Apr-Jun)	3Q15 (Jul-Sep)	4Q15 (Oct-Dec)	1Q16 (Jan-Mar)	2Q16 (Apr-Jun)	3Q16 (Jul-Sep)	4Q16 (Oct-Dec)	1Q17 (Jan-Mar)	2Q17 (Apr-Jun)	3Q17 (Jul-Sep)	4Q17 (Oct-Dec)	1Q18 (Jan-Mar)		
CASH GENERATED BY OPERATIONS (NS)																							
Income (loss) before income and social contribution taxes	158.3	(64.1)	426.8	176.5	352.0	70.6	47.8	(2.0)	(70.5)	172.5	77.0	489.8	179.5	281.3	364.8	(269.7)	(14.4)	(11.4)	696.7	803.8	323.8		
Profit before taxes discontinued operation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Adjustments to reconcile net income to net cash provided by operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Depreciation and Amortization	159.4	127.1	153.4	158.7	160.1	170.4	172.7	174.9	165.0	316.6	337.5	358.5	350.8	365.1	388.0	631.0	446.6	450.8	446.0	594.4	473.3		
Biological Assets	(35.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stock option	3.3	2.2	2.2	2.3	2.6	2.6	2.6	5.3	2.9	2.9	2.9	3.9	2.9	2.9	2.9	2.8	2.8	3.3	4.7	41.1	12.7		
Equity Pick-up	1.5	32.4	(191.0)	(88.9)	(22.1)	(156.1)	(64.6)	(137.2)	(165.2)	(58.9)	(29.3)	(449.7)	(439.8)	(249.0)	(412.6)	(464.3)	(258.7)	(38.8)	(415.8)	(289.0)	(294.8)		
Losses (Gains) on Disposal Assets	6.7	5.1	0.0	1.8	2.1	2.8	2.6	1.3	1.8	2.8	16.5	4.8	3.7	3.8	11.7	(2.4)	19.2	17.0	9.2	2.8			
Fair value of investment properties	(52.9)	(7.7)	(45.4)	(72.2)	(4.8)	4.8	0.0	(0.0)	0.0	0.0	0.0	(0.0)	-	-	-	-	-	-	-	-	-		
Fair value of assets held for sale	-	-	-	-	4.8	(4.8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Judicial demands' provision	16.0	25.1	42.4	13.4	18.5	7.7	14.5	57.7	9.2	14.3	13.0	22.5	21.2	37.1	21.1	18.0	18.4	23.2	28.5	102.3	30.8		
Interest, monetary and exchange variations, net	155.0	359.9	83.1	382.7	151.9	239.4	290.1	379.4	332.9	659.8	592.9	811.2	863.7	816.9	877.5	630.2	673.2	712.8	552.6	923.1	549.4		
Effect from the formation of JVs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gain on compensation claims	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Others	4.2	5.4	34.8	3.7	15.7	25.7	25.6	(32.1)	21.2	51.8	93.8	92.8	55.6	(9.3)	54.5	(37.8)	79.8	76.9	83.8	(924.8)	88.4		
Variation on Assets and Liabilities:																							
Accounts receivable	(48.7)	(159.8)	(4.3)	(90.2)	(30.7)	(96.6)	(73.3)	(47.7)	(8.6)	(51.4)	(13.6)	138.1	(0.8)	(97.3)	(39.5)	69.1	104.3	(157.4)	(89.8)	(109.6)	(31.0)		
Investment Securities	-	-	-	-	(0.0)	(65.0)	(0.0)	(0.0)	(0.0)	183.2	(137.7)	7.3	15.0	-	34.5	-	-	-	-	-	-	-	
Restricted Cash	(0.0)	18.2	-	-	-	-	-	-	-	74.7	(74.7)	-	-	-	-	-	-	-	-	-	-	-	
Inventory	49.3	4.5	(15.4)	(17.4)	41.6	(34.1)	(22.3)	(25.5)	33.5	(29.5)	(117.6)	(86.4)	(6.3)	10.1	(49.9)	52.8	30.9	20.9	(38.2)	(53.9)	21.2		
Related Parties	(3.5)	(12.2)	20.7	(16.8)	(33.0)	3.3	6.4	(5.9)	(34.9)	(18.1)	33.9	117.4	17.2	41.6	76.5	72.1	57.3	20.6	(66.0)	(24.2)	(116.5)		
Advances to Suppliers	15.8	4.4	0.1	0.4	(0.0)	0.0	(0.0)	1.5	1.2	(26.6)	(7.4)	32.9	(0.0)	-	(0.0)	-	(16.2)	0.8	4.9	(28.0)	(10.3)		
Suppliers	72.7	192.1	(158.0)	21.7	(83.7)	70.5	66.0	213.4	121.9	224.9	(275.2)	(27.4)	(67.0)	21.1	(67.3)	(120.3)	44.5	145.3	104.6	(116.6)			
Salaries payable	(43.6)	10.8	(11.5)	(13.5)	(43.2)	2.7	11.3	(20.5)	(51.1)	2.2	15.9	(35.8)	(72.5)	(10.3)	(7.3)	(37.4)	(105.2)	5.6	10.5	(32.5)	(137.0)		
Judicial demands' provision	(1.1)	(94.3)	49.3	(62.4)	(6.6)	(1.4)	(3.6)	(4.3)	(0.3)	(7.0)	(13.8)	(15.2)	(16.5)	(9.2)	(32.6)	(15.3)	(8.2)	(7.6)	(14.6)	(1.8)	(22.1)		
Derivative financial instruments	(0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Taxes and Social Contributions Payable	(246.4)	(41.8)	(19.8)	(94.9)	(56.0)	(69.2)	(58.3)	(262.6)	1.5	(110.4)	40.4	9.1	(74.3)	(38.2)	29.1	(60.3)	(20.4)	5.7	(80.3)	(16.0)	(28.9)		
Taxes Payable	6.3	(40.8)	(0.3)	27.9	0.7	36.1	17.0	(5.9)	(34.6)	81.0	(81.0)	(119.7)	41.6	76.5	72.1	57.3	(20.6)	(66.0)	(24.2)	(116.5)	(95.5)		
Profit from discontinued operations, net or tax	116.4	-	-	-	(2.0)	44.9	4.1	24.2	7.0	0.2	6.1	9.6	(0.1)	4.9	9.5	55.8	-	-	-	-	-		
Other assets and liabilities, net	(113.4)	(10.5)	35.1	57.7	(3.4)	(62.5)	(18.0)	84.7	(109.9)	(22.4)	(91.1)	(14.0)	(251.3)	(95.2)	(13.3)	166.4	(136.9)	(112.8)	(33.3)	1134.4			
Cash Flow from Operating Activities	219.9	356.0	402.0	390.5	244.5	260.4	424.9	186.2	300.8	1,358.6	874.8	816.4	663.5	962.7	1,382.1	628.6	970.0	941.0	1,253.5	923.6	1,830.3		
CASH FLOW FROM INVESTMENT ACTIVITIES																							
Cash flow from investing activities																							
Acquisitions, net of acquired cash and advances for future capital increases	38.9	(59.6)	(5.3)	65	3	0.6	3.1	12.8	11.2	(25.7)	31.6	11.1	-	(0.5)	(67.9)	(8.5)	-	-	-	-	(11.4)		
Securities	-	-	-	-	-	-	-	-	-	-	(161.4)	370.2	213.5	(1,416.4)	326.5	250.2	399.9	(1,684.4)	689.9	(1,736.6)	334.7		
Restricted Cash	-	-	-	-	-	-	-	-	-	-	57.5	(84.1)	78.3	(7.3)	(6.3)	(5.5)	(24.1)	5.4	(6.0)	0.1	28.8		
The net acquired from business combination	-	-	-	-	-	-	-	-	-	-	169.7	(66.7)	-	-	-	-	-	-	-	-	(116.5)	(35.9)	
Capital contribution in jointly controlled entity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(4.0)	-	
Dividends received from subsidiaries	(191.4)	-	125.4	285	197	1.9	118.0	390.7	93.9	113.1	(0.0)	470.6	251.4	195.8	221.5	573.8	282.3	300.6	326.9	450.6	408.5		
Acquisition cost of business	-	-	-	-	-	-	-	-	-	-	169.7	(169.7)	-	-	-	-	(0.0)	-	-	-	-	-	
Additions to property, software and other intangibles	(251.4)	(298.2)	(370.8)	(307)	(192)	(266.4)	(297.1)	(306.6)	(181.0)	(616.0)	(544.3)	(669.0)	(389.2)	(659.7)	(547.3)	(594.3)	(542.6)	(588.1)	(567.4)	(759.3)	(592.4)		
Cash for treatment and planting of sugarcane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Related Parties	(92.0)	-	-	(80)	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	-	-	-	-	
Other Financial Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cash reclassified to discontinued operations	196.5	-	-	(3)	(0.8)	(3.3)	(12.9)	(11.9)	(0.2)	(6.0)	108.6	(0.1)	2.1	(7.4)	(8.5)	-	-	-	-	-	-		
Cash received on sale of fixed assets, intangible assets and	(250.9)	65.4	-	-	0	0.7	0.4	0.0	(0.3)	1.7	3.8	3.3	-	0.0	(0.0)	(0.2)	7.0	1.1	-	(0.7)	1.1		
Capital investment in subsidiaries and affiliates	-	-	-	(7)	(5.7)	(6.2)	(26.4)	(22.6)	-	(37.2)	(23.0)	(2.2)	-	2.2	0.0	-	-	-	-	-	-	-	
Non-controlling interest subscription	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other Financial Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(186.1)	-	-	-	-	-	-	
Net cash used in discontinued operations	29.4	-	-	57	-	-	68.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cash Flow from Investment Activities	(520.8)	(292.4)	(250.7)	20.0	(2.0)	(269.7)	(185.1)	126.2	(110.7)	(357.4)	(656.0)	121.0	151.7	(2,060.7)	(78.7)	1,260.7	(153.3)	(1,969.3)	443.4	(2,173.9)	144.9		
CASH FLOW FROM FINANCIAL ACTIVITIES																							
Cash flow from financial activities																							
Loans and borrowings raised	2,516.9	148.9	347.6	576	191	635.5	218.9	674.9	705.5	1,677.2	670.3	2,148.1	447.6	4,574.6	730.7	1,534.4	2,417.5	87.6	1,739.5	1,930.6	2,155.1		
Loans amortization and financing - Principal	(2,608.8)	(265.5)	(502.6)	(692)	(417)	(2,513.7)	(383.1)	(317.6)	(359.5)	(1,506.2)	(561.4)	(1,306.5)	(394.4)	(4,902.8)	(788.3)	(937.1)	(371.3)	(508.4)	(796.2)	(2,068.0)	(1,815.4)		
Loans amortization and financing - Interest	-	-	-	-	-	-	-	-	-	(167.6)	(320.9)	(592.8)	(282.1)	(328.9)	(530.3)	(243.6)	(344.0)	(312.4)	(443.5)	(389.1)	(454.3)	(428.2)	
Amortization and lease - Principal	-	-	-	-	-	-	-	-	-	(83.4)	(110.7)	(95.5)	(111.2)	(119.7)	(91.6)	(90.8)	(111.1)	(99.2)	(80.6)	(57.2)	(262.6)		
Amortization and lease - Interest	-	-	-	-	-	-	-	-	-	(63.0)	(45.7)	(58.1)	(91.2)	(85.7)	(89.3)	(64.3)	(80.8)	(32.5)	(78.7)	(72.2)	(52.1)	(43.5)	
Advances on real estate credits	-	-	-	-	-	-	-	-	-	(33.1)	(33.4)	(32.9)	(31.2)	(33.0)	(31.5)	(33.2)	(30.8)	(32.5)	(31.9)	(31.9)	(29.3)		
Advances on real estate credits - Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.9)	(0.7)	(0.5)	(0.3)	(0.1)		
Consent fee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Derivative financial instruments	-	24.4	55.5	3	(31)	(5.3)	(37.1)	(11.6)	178.8	25.1	57.9	319.9	(8.1)	(13.2)	(227.3)	(124.9)	(157.1)	22.3	(147.1)	17.2	(10.0)		
Secured Account	-	-	-	-	-	-	-	-	-	-	-	-	-	46.1	(42.6)	42.6	11.6	(0.5)	3.0	(10.4)	(17.1)	(0.1)	
Capital contribution by minority shareholders in subsidiaries	11.1	-	-	-	-	-	-	-	-	0.0	(0.0)	-	-	1,978.9	(0.5)	(0.7)	0.0	1.9	-	2,028.3	-		
Funding through preferred shares	-	-	0	0	2,000.0	(53.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Treasury Stock	(0.0)	(25.7)	(44.0)	0	0	-	-	-	-	(12.2)	-	-	-	0.9	(0.9)	-	-	(25.9)	(53.5)	(701.5)	(10.0)		
Stock option plan	2.1	6.0	3.6	7	5	0.3	40.7	-	-	-	-	-	-	-	-	17.2	20.1	16.0	0.4	18.2	2.7		
Acquisition of non-controlling interest	(92.5)	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(268.1)		
Debt balances ADM to pay	38.7	-	-	-	-	-																	

i Data sources: Historical oil (liquids) data from BP Statistical Review; projections from Shell (2013 Mountains and Oceans scenarios plus 2018 Sky scenario and the 2021 Waves, Islands, and Sky 1.5 scenarios), BP (three scenarios released in 2020), the International Energy Agency (baseline projections since 2000 plus three scenarios in 2010 and three in 2020). And ExxonMobil sole Outlook for Energy scenario (2019). Online ExxonMobil has also “evaluated” the EMF27 two-degree scenarios.

ii Data sources: see figure 2.

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