



# The path to a responsible and sustainable energy future

Lamar McKay  
Deputy group chief executive

---

31 May 2017





## Introduction

Thanks so much, Greg. I appreciate the kind introduction and the warm welcome. It's always great to be here in Houston, where I've spent a significant portion of my career, including nearly four years as chairman and president of BP America. As many of you know, Houston is home to BP's US headquarters, and it also represents our largest employee base anywhere in the world.

Over the past few decades, it's become a truly global city, in every sense of the word. In fact, earlier this month, the Los Angeles Times reported that Houston is now "the most racially and ethnically diverse major metropolis in the country." Demographers also have projected that, within the next decade, Houston could surpass Chicago to become America's third-largest city in terms of population.

Meanwhile, Houston has remained the energy capital of the world - a place that attracts engineers, scientists and innovators from all parts of the country and all corners of the planet.

Both the membership and the growth of the Greater Houston Partnership have reflected Houston's emergence as a global city. Just looking out at all the different companies and industries represented in this room provides confirmation that GHP has created a world-class business forum for a world-class city.

It's a forum that, in addition to supporting economic development, also supports policy discussions on some of the most important issues of our time. I want to take this opportunity to congratulate Bob Harvey, Jeff Shellebarger and everyone else at GHP on what the organization has achieved.

I also want to thank you all for inviting me to speak today. I'm here to talk about the state of the energy industry: where we are, how we got there, and where we might be headed in the years to come.

## A transformative moment

When you work in this industry, you learn pretty quickly that things are constantly changing, which means companies like BP are constantly adapting. As folks here in Houston know all too well, price shocks have been a recurring feature of the global energy landscape since the 1970s. It's easy to forget that when we go through a period of relative stability, as we did from 2010 to 2014. But stability is not the norm - quite the opposite.

In recent years, we've been dealing with an extraordinary amount of simultaneous change.

For starters, the dramatic oil price decline that began in late 2014 has been followed by a slow and uneven recovery, as the market gradually rebalances. The external environment has forced companies to make significant



adjustments on capital expenditures, operating costs and headcount. We've all had to make our businesses competitive at a much lower price level.

One of the biggest reasons for the price drop was the US shale revolution, which has been arguably the fastest and most significant energy transformation in recent history. The shale revolution began right here in Texas, and it's fueled a remarkable surge of oil and gas output. In fact, between 2005 and 2016, US oil production increased by 71%, while US natural gas production increased by 50%.

Something else remarkable happened over that same period: America's energy-related carbon dioxide emissions actually declined by 14%.

Indeed, America has become a genuine global leader in reducing CO2 emissions, largely because lower carbon natural gas has been displacing coal in the power sector.

Consider these numbers: In 2005, natural gas accounted for roughly 19% of net US power generation. In 2016, it accounted for 34%.

Meanwhile, coal went from 50% of power generation to 30%, while wind energy went from less than one-half of 1% to nearly 6%.

The US Energy Information Administration reports that, for two consecutive years now, the overall carbon intensity of America's power sector has declined by around 5% - the first time since 1973 that we've seen such a decline two years in a row.

The global energy mix has been changing, too, amid soaring demand in developing countries such as China and India. Between 1995 and 2015, total primary energy consumption around the world increased by 53%, with oil consumption rising by 30%, natural gas consumption rising by 63%, coal consumption rising by 71% and consumption of renewables rising by 870%.

(You heard that right - 870%.)

Amid all these recent changes, some of the world's largest oil producers have been experiencing political and social unrest, or facing economic sanctions, or rejoining global markets, or opening up to foreign investment.

Add it all up, and we're clearly in the middle of a transformative moment for the industry.

The big questions are: What comes next? Will supply and demand trends continue at their current pace? Will they accelerate? Slow down? Go in reverse? And what does it all mean for the ongoing transition toward a lower carbon energy mix?



## Short-term outlook

As deputy chief executive of BP, part of my job is to examine these questions and then help devise a long-term strategy for safe and sustainable growth.

Needless to say, we base our long-term strategy on the long-term outlook for the global energy economy. But before I get to the long-term outlook, let me say just a quick word about the short-term outlook for oil prices.

In the first quarter of 2017, the price of the global benchmark oil, Brent crude, averaged about \$54 dollars a barrel, compared with \$49 dollars a barrel in the fourth quarter of 2016 and \$34 dollars a barrel in the first quarter of 2016.

For the remainder of the year, BP expects to see continued rebalancing in the oil market, though much will depend on whether OPEC and Russia do indeed extend their production cuts through to 2018 (as they announced last week), and whether US tight oil production grows faster or slower than expected in response to the price environment.

In other words, the short-term price outlook remains volatile and uncertain.

## Long-term outlook

As for the longer-term outlook, BP's 2017 Energy Outlook report projects that, in what we consider the most likely scenario:

- Global energy demand will rise by around 30% between 2015 and 2035, with China and India alone accounting for more than half the increase.
- Hydrocarbons will see their share of primary consumption decline, yet they'll still account for more than three-quarters of total energy in 2035.
- Coal consumption will peak sometime in the mid-2020s, thanks in large part to a decline in coal demand both from the advanced economies of the OECD and also from China.
- Natural gas will be the fastest-growing hydrocarbon - led by US shale gas - and the expansion of liquefied natural gas will help produce a globally integrated gas market.
- Meanwhile, renewables' share of total energy consumption will grow from 3% in 2015 to 10% in 2035, making renewables far and away the fastest-growing energy source.



- In addition, the energy efficiency of the global economy will increase rapidly, with worldwide energy intensity falling by 33% between 2015 and 2035.
- As for carbon dioxide emissions, energy-related CO2 emissions will grow by just 13% between 2015 and 2035, compared with 51% between 1995 and 2015.

Again, that's our base-case scenario - it's what we consider more likely to happen than other possible scenarios. But as BP chief economist Spencer Dale said at the launch of our Energy Outlook, "Forecasting is not about getting it right or wrong; it is about better understanding the nature of the uncertainty you face." So our Outlook considers some of the key uncertainties, including:

- the speed of the world's mobility revolution, and how it affects or disrupts oil demand;
- the speed at which natural gas consumption increases;
- and the speed at which the world transitions to a lower carbon energy economy.

Just to clarify: When BP talks about the "mobility revolution," we're talking about the ongoing shift to electric and autonomous vehicles, along with the rise of innovations like car sharing and ride pooling.

Each of these three big uncertainties - the mobility revolution, the shift to natural gas and the lower carbon transition - each of them could play a significant role in changing the path of energy demand and greenhouse gas emissions.

For example, in BP's "faster transition" scenario - a scenario in which the world takes more aggressive action to reduce emissions - in that scenario, renewables account for 16% of total energy in 2035, as opposed to 10% in our base-case scenario. In BP's "even faster transition" scenario, the renewable share of total energy rises to 23% by 2035.

Now, that's a lot of numbers and scenarios, and I'm sure it can all seem a bit confusing. But this much is clear: In order to accelerate our transition to a lower carbon energy mix, the world needs to do significantly more than it's doing today.

## Competing challenges on energy and emissions

Of course, it's easy to call for greater action on low-carbon energy policy; it's much harder to lay out a detailed blueprint that's both economically responsible and technologically feasible.



We need to remember that, when it comes to energy and carbon, we face two competing challenges: The world has to continue delivering the energy that drives human progress and lifts people out of poverty, while also reducing greenhouse gas emissions.

With these challenges in mind, BP has identified six key actions that can help the world - and BP - transition to a lower carbon future. We're doing important work in each area, as we have for many years now. Those actions include:

- putting a price on carbon;
- expanding natural gas production while taking steps to reduce methane emissions;
- expanding the use of renewable energies;
- investing in start-ups and innovation aimed at accelerating the development and commercial viability of low-carbon technologies;
- improving the energy efficiency of industrial operations;
- and finally, helping consumers around the world improve their own energy efficiency.

We believe these six factors - carbon pricing, natural gas and methane, renewable energy, technological innovation, operational efficiency and consumer efficiency - we believe these factors are the key to a lower carbon future. BP is committed to playing our part and helping the world achieve a more sustainable energy mix.

## BP's long-term strategy

This commitment is reflected in our long-term strategy. As we described a few months ago, the strategy has four pillars:

1. BP is shifting our upstream portfolio toward natural gas and “advantaged” oil (by which we mean higher-margin or lower-cost oil).
2. We're seeking market-led growth in our downstream businesses.
3. We're supporting innovative companies and low-carbon technologies through venturing and other investments.
4. We're modernizing operations across the company to drive greater efficiency and productivity.



Needless to say, each and every one of these pillars is underpinned by BP's commitment to safety, which will always be our highest priority and the foundation of everything we do.

On the upstream side, BP has brought 24 major projects online in the past five years, including six projects in 2016 alone. One of the six projects that came online last year was our Thunder Horse South Expansion project in the Gulf of Mexico, which started up 11 months ahead of schedule and \$150 million dollars under budget.

We expect to bring another seven projects online this year - in Australia, Egypt, Oman, Trinidad and the North Sea. Six of those seven are natural gas projects.

Looking further ahead, we have nine additional major projects scheduled to start up between 2018 and 2021, including our \$9 billion-dollar Mad Dog Phase 2 project in the Gulf of Mexico.

In terms of BP's daily production around the world, we expect to add more than 800,000 barrels of oil equivalent by 2020, and more than a million barrels by 2021.

Today, gas accounts for almost 50% of BP's production. By the mid-2020s, we expect it to reach around 60%.

Beyond producing natural gas, BP also markets it. In fact, we're the largest marketer of natural gas in all of North America, selling enough to meet the average daily needs of every home and commercial building in the United States.

We're also supporting the lower carbon transition through our US wind energy business and our Brazilian biofuels business. Indeed, BP has the largest operated renewable energy business of any major oil and gas company, including several wind farms here in Texas.

Meanwhile, BP Ventures has invested more than \$325 million dollars in corporate venturing since 2006, with many of our investments supporting low-carbon technologies. Last year alone, we announced five new venture investments, among them a \$30 million-dollar investment in Fulcrum BioEnergy, a California-based company that has pioneered the development and production of low-carbon jet fuel.

All of these investments are in addition to BP's support for the Oil and Gas Climate Initiative. OGCI is an effort started by 10 companies - including both international oil companies like BP and Shell, and national oil companies like Saudi Aramco and CNPC - that together represent more than 20% of global oil and gas production. Part of OGCI's work is the creation of OGCI Climate Investments, which is backed by a collective pledge from OGCI companies to invest \$1 billion dollars in low-carbon technologies over 10 years.



Right now, the biggest focus areas for OGI Climate Investments are reducing methane emissions; developing carbon capture, use and storage technology; and improving energy efficiency in the transportation and industrial sectors.

As for BP's internal modernization push, we're aiming to create a more agile business, maximize the potential of digital technology, and foster an upstream mindset focused on margins.

To give you just one example of our work on the digital side: Through BP's partnership with GE, we've been pilot testing the Plant Operations Advisor technology in our Gulf of Mexico operations. Plant Operations Advisor gives our teams real-time surveillance tools to detect potential facility issues well in advance. We're currently using this technology to process more than 150,000 sensor records per minute on the condition of our equipment, and we plan to have it deployed in more than 30 fields by 2018

## Safety

Plant Operations Advisor represents a good example of how technology is making BP's operations, not only more efficient, but also safer.

Whether in the Gulf of Mexico, the Lower 48 or anywhere else around the world, safety is the foundation of everything we do.

In the seven years since the Deepwater Horizon accident, BP has worked relentlessly to improve our standards, our training, our oversight and our technology, while also strengthening our underlying safety culture.

Regardless of how our business strategy or operational footprint may change, safety will always be one of our core values, our most important commitment and our highest priority.

That's why our Houston Monitoring Center provides round-the-clock support to our operations in the Gulf.

It's why we use state-of-the-art simulation machines to prepare our people for challenges they might face in the field.

It's why everyone at BP has both the power and the responsibility to stop a job - any job - if something doesn't seem right.

In the long run, you can't be a strong company or a sustainable company if you're not a safe company.



At BP, we expect our people to keep that in mind at every job, everywhere, every day.

## The proper role for policymakers

As we continue building a safer, stronger, more sustainable business, we'll continue advocating flexible, well-designed, market-based energy and carbon policies.

BP has long believed that energy production and environmental protection are not mutually exclusive - and the US shale gas revolution has provided confirmation of this. Indeed, the shale boom has demonstrated that it's possible to increase energy production while reducing economy-wide CO<sub>2</sub> emissions.

But here's the key point: Both the shale boom and the simultaneous drop in US emissions have been driven mainly by market forces, not by top-down government regulations.

Moving forward, BP believes the US should continue letting the market drive things, rather than try to pick winners and losers. As I said a moment ago, we support the use of flexible, well-designed, market-based mechanisms - such as an economy-wide carbon price - to create the right incentives both for energy producers and for energy consumers.

## Conclusion

Just one final thought, before I wrap up.

Given the current political uncertainty - not only here in the US, but also in the UK, Europe and elsewhere around the world - none of us can predict what the world's energy and carbon policies will look like even two years from now, let alone 10 or 20 years from now.

Yet we believe that what oil and gas companies do will remain essential to human prosperity - two years from now, 10 years from now, 20 years from now, and beyond.

Earlier in my remarks I mentioned that, in BP's latest Energy Outlook report, we outline multiple long-term energy scenarios based on different projections of how fast the lower carbon transition will occur. It's important to note that in all the scenarios - along with scenarios developed by independent researchers from the International Energy Agency, MIT and IHS Markit - in each of these scenarios, oil and gas continue to be crucially important energy sources in 2035.

The industry has to work safely. We have to work responsibly. And we have to do our part to help create a secure, sustainable global energy mix.



Here in Houston, we have companies, universities and public officials all working to help us meet these challenges. We also have the Greater Houston Partnership, which has provided valuable support to business leaders, researchers and policymakers alike. Indeed, GHP epitomizes Houston's dynamic economy, innovative culture and "can do" spirit.

For all those reasons, it's been a great honor to speak with you today, and I want to thank you again for giving me this opportunity.

Thank you