

- Good morning – and thank you for having me speak today
- Congratulations TXOGA on 100 years of advocacy – an achievement in any industry, but especially one as dynamic as ours
- Let me briefly introduce myself
 - I have been at BP for over 35 years now
 - I am a Chemical Engineer and a Downstreamer
 - I'm a wife, mother and grandmother
 - I'm also a Proud Texan – so it's great to be here at home.
- Today – I'm going to talk about
 - where our industry has been
 - where we are today
 - and where at BP we see the future
- I'm also going to talk about technology and innovation

- Let's turn the clock back to the year TXOGA was founded – looking at the world in 1919
 - In a devastated Europe – we see how an energy transition from coal to oil changed the course of World War 1
 - Here at home, Texas became the first state to ratify the 19th Amendment giving women the vote in national elections
 - Prohibition went into effect in Texas in 1919, the result of a powerful populist political movement
 - And 20 years after Spindletop, Texas's nascent energy industry was at a full gallop
- Fast forward a century
 - The US is now the world's largest oil and gas producer
 - This is worth repeating – the US is now the world's largest oil and gas producer
 - With less than 4% of the world's oil and 6% of gas reserves, the US now accounts for
 - 16% of global oil supply
 - over 20% of global gas supply
 - in 2018 alone, LNG exports increased 65%
- From humble beginnings – Texas now delivers
 - More than one-fifth of America's domestically produced energy
 - And nearly one-third of total refining capacity
 - Texas's leading role in US energy production is unquestioned

- At BP, everything we do across the energy sector, we do in Texas
 - Oil and gas exploration and production
 - Research and technology development
 - Natural gas marketing
 - Petrochemical production
 - Shipping
 - And our US wind business is headquartered here in Texas
- Since 2005, BP has been one of the largest investors in deepwater Gulf of Mexico
 - As a result – in the last 5 years we have increased average daily production by more than 60% to over 300,000 barrels per day
 - Our next wave of growth is already underway
 - Using new technology, our advanced seismic imaging has revealed
 - An additional 400 million bbls of oil at our Atlantis field
 - And another 1 billion bbls at our Thunder Horse field
 - We plan to invest \$2-3 billion each year in more Gulf of Mexico developments
 - Which will safely grow production to more than 400,000 bbls per day by the mid 2020's
- We are also RE-investing in Texas...
 - BPX Energy, our lower 48 business, is a new era of growth
 - Last year, we signed a \$10.5 billion deal with BHP to purchase world class unconventional assets in the Permian, Eagle Ford and Haynesville basins
 - It was our largest purchase since buying ARCO in 1999
- BP's North American Gas and Power business, based in Houston, is the #1 marketer of natural gas in North America – buying and selling 20 billion cubic feet each day.
- And I can't fail to mention – that Houston is BP's largest global employee base.

- Now – let me talk about the future
 - The world's population is expected to increase by around 1.7 billion people reaching nearly 9.2 billion people by 2040
 - In the same timeframe – global energy consumption is set to increase by around 1/3
 - Driven by fast growing developing economies such as India and China
 - There is a un-surprising correlation between Human Development and Energy Consumption
 - The UN Human Development index - A composite index of life expectancy, education and standard of living
 - When plotted against per capita energy consumption
 - Suggests energy consumption of 100 GJ/head or greater translates to greater economic productivity, and a significantly higher HDI.
 - Today, 80% of the global population lives in countries below this standard
 - India, for example, has a per capital energy consumption of just 24 GJ/head with an HDI of 0.64.
 - Compare that to the US per capita Energy Consumption of almost 300 GJ/head with an HDI of 0.924.
 - Worldwide, over 1 billion people live without electricity today. Two billion more could join them in the next 20 years
 - For every 6 families who turn on an electric light after dark there's one family that still can't
- To enable human prosperity for most of the world, we will need more energy, but with fewer emissions

- Meeting the world's rising energy needs while reducing emissions is what we call the Dual Challenge
- We believe it's the defining issue of our time
- It's an issue that sparks passion, anger and frustration
- We don't believe reducing carbon emissions means the end of oil and gas – far from it
- We DO believe it means innovating and leveraging our technology to meet the purpose of Advancing Energy to Improve People's Lives
- Hydrocarbons will play a critical role, and BP continues to invest in oil and gas
- At BP, we are focused on
 - Reducing emissions in our operations – and are well on our way to meeting our target reduction of 3.5 million tons of reductions by 2025.
 - Improving our products
 - Creating low carbon businesses.
- There is no single answer – how we decarbonize here in the US requires a different answer than in Beijing, or Mumbai
- It's a complex picture – but to succeed we need every tool at our disposal.

- Technology is changing the world and our lives at an unprecedented pace.
- Across our industry, companies are leveraging technology to get after these challenges
- Let me share a little of what we are doing at BP:
 - I'll start with our "Return to Scene" or R2S technology
 - A technology first developed for crime scene investigations in Scotland
 - It performs 360 photographic imaging of a facility for a "digital twin"
 - It lets in-office engineers "inspect" sites remotely
 - It is safer, faster, and more efficient
- We are also using some exciting new drone technology for worldwide continuous measurement of methane emissions on all new projects
 - We are increasing accuracy of well surveys using optimal gas imaging and laser technology developed by a hog hunting company in Beaumont Texas
 - Field technicians receive automated work orders with well site images and video BEFORE they arrive.
 - Thanks to that technology, today, BPX Energy drones can inspect 1500 wells in just 30 days
 - As drone technology improves, these 1500 wells could be surveyed in half that time
 - This one technology has made a sustainable reduction in methane emissions.
- In onshore gas – our business spans 5 million acres from Texas to the Rockies
 - Formerly, we had 10,000 high-bleed pneumatic valves across this territory – each operated by gas pressure.
 - We just finished replacing each one with new, low bleed valves, again, making a step change reduction in emissions.
- These are some examples, but there is much much more going on today.

- Our industry as a whole is making our oil and gas operations cleaner and better
- But technology in isolation will not solve this problem, we must innovate and COLLABORATE to meet this global challenge.
- Across the sector projects are in progress on
 - Direct air carbon capture
 - Hydrogen
 - And.. Biofuels
- We are testing new ideas, like CCUS, that could revolutionize how we source, use and track energy.
- For example, here in Texas, Air Products is designing a carbon capture system in Port Arthur
- Industrywide, the oil and Gas Climate Initiative is investing \$1 billion in innovative startups to lower the industry's carbon footprint.
- We must continue to challenge how emerging technologies such as digital and electrification play a role in this solution
- We must enter into broader conversations, be open to new ideas
- We must continue to develop and diversity our talent base
- Technology will provide a platform, but innovation will provide the solutions.

- I want to close with some final thoughts on TXOGA's centennial
- A LOT has changes since 1919 – especially on the technical side
- We have a populist political movement in America today, on both sides of the aisle, that powerfully affects our industry.
 - I believe the economic and human development data is compelling – stopping hydrocarbons overnight would be disastrous.
 - Last year, TXOGA members supported almost 350,000 jobs and paid more than \$14 billion in taxes to support Texas schools, roads, and first responders
- But in some ways, 2019 looks similar
 - The industry remains materially important to improving people's lives worldwide.
- Globally, what we do matters.
 - We heat homes
 - We power schools, hospitals and industries
 - We provide raw material for products that make daily life better
- And because we matter – we continue to share a responsibility to meet the dual challenge – together, as an industry.
 - We must product our energy products in a much cleaner way
 - We must cut down on methane leaks and flaring – today, the Achilles heel of gas
 - We must bring people together on a common set of solutions – including regulation and infrastructure.
- There isn't one road to net-zero, but many paths – and we need to pursue them all.
- BP is proud to be part of that solution. We're proud to be in TXOGA
- Congratulations again on 100 years – here's to 100 more.
- Thank you.