



## Resilient and focused hydrocarbons

**Gordon Birrell**

EVP, production and operations

Hi and welcome to the final day of bp week.

I'm Gordon Birrell and I'm hugely proud to lead bp's Production and Operations organization and have a real sense of excitement about what is possible from this team.

On day one, you heard about bp's Energy Outlook and how we plan to reimagine energy and reinvent bp.

On day two, we outlined how we plan to rapidly scale in low carbon electricity and energy and how we intend to drive growth in convenience and mobility. We also explained the important role played by two of our integrators in enabling this growth.

Today we will explain the importance of another of our integrators - digital and innovation. And we will say more about our financial frame and investor proposition.

But first, I will talk about resilient and focused hydrocarbons.

[Video introduction to resilient and focused hydrocarbons]

# Cautionary statement



## Forward-looking statements - cautionary statement

In order to utilize the 'safe harbor' provisions of the United States Private Securities Litigation Reform Act of 1995 (the 'PSLRA') and the general doctrine of cautionary statements, bp is providing the following cautionary statement: The discussion in this results announcement contains certain forecasts, projections and forward-looking statements - that is, statements related to future, not past events and circumstances - with respect to the financial condition, results of operations and businesses of bp and certain of the plans and objectives of bp with respect to these items. These statements may generally, but not always, be identified by the use of words such as 'will', 'expects', 'is expected to', 'aims', 'should', 'may', 'objective', 'is likely to', 'intends', 'believes', 'anticipates', 'plans', 'we see', 'focus on' or similar expressions.

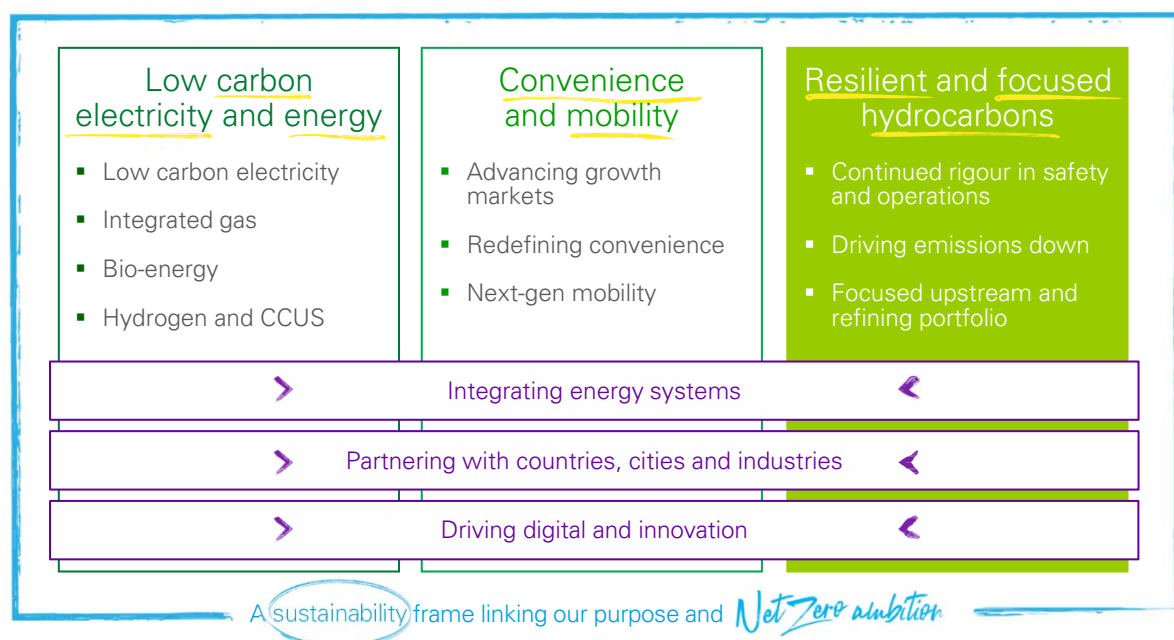
In particular, the following, among other statements, are all forward looking in nature: bp's new sustainability frame focusing on net zero, people and planet, including statements regarding targets and aims for 2025, 2030 and 2050 with respect to operational emissions, carbon content of its oil and gas operations, the carbon intensity of products bp sells, methane measurement at major oil and gas processing sites by 2023 and subsequent reductions of methane intensity of operations including 2025 targets, and aims to increase the proportion and amount of investment into non-oil and gas businesses over time; bp's new strategy to focus on low-carbon electricity and energy, convenience and mobility, cost and carbon resilient and focused hydrocarbons, including statements regarding integrating energy systems, partnering with countries, cities and industries and driving digital and innovation; aims with respect to resilient and focused hydrocarbons, including plans to maintain rigour and safety in operations, drive down emissions and to focus the oil, gas and refining portfolio; plans and expectations for the new Production and Operation operating model to drive a safer, agile and resilient business by centralising resources, digitalisation and adopting an agile organisational structure; ambition to eliminate Tier 1 process safety events and life changing injuries and the strategy to deliver on this ambition; plans and expectations to maximise throughput and revenue through production management in oil and gas assets and refinery business improvement plans, including to deliver more than 96% refining availability by 2025, first quartile net cash margin in the portfolio and second quartile or better non-energy cash costs as measured by Solomon and to ultimately reduce refining throughput to around 1.5 mboed by 2025; plans and expectations to transform \$3bn per annum of maintenance and inspection spend; plans and expectations to drive efficiency and reliability to grow value, including to deliver \$1.5bn of annual cost savings in the hydrocarbon business by 2023 and to achieve oil and gas plant reliability, well reliability and refining availability targets by 2025 and 2030; plans and expectations regarding the hydrocarbon portfolio and investment approach, including statements regarding expected capital expenditure and paybacks from 2021 through 2025, investment hurdles and total proved reserves to production ratio, plans and expectations for the focused approach to exploration, including to not enter new countries, focus on new hubs in existing production areas and near hub tiebacks, decrease exploration capital to \$350-400m, build on a track record in near-hub exploration and to add 350mmboe and \$1.2bn of value in near-hub exploration; plans and expectations with respect to major projects, including to deliver 900mboed from major projects by the end of 2021 and start-up new major projects from 2020 through 2023+; aim to leverage existing infrastructure in oil investment options through tie-backs and infills; ambition to drive value through integrated downstream gas and to high-grade the next phase of gas investment; plans and expectations to drive a resilient production outlook through investment decisions, with respect to the oil and gas production balance and to achieve gas and liquids production targets by 2025; plans and expectations with respect to Upstream production, including to meet targets for Upstream production and unit production costs by 2025 and 2030, to grow in key high-margin regions, to divest around 600 mboed by 2025 and to maintain managed base decline at 3-5% to 2025; plans and expectations to grow EBITDA to 2025; and expectations regarding world oil and gas supply and demand.

By their nature, forward-looking statements involve risk and uncertainty because they relate to events and depend on circumstances that will or may occur in the future and are outside the control of bp. Actual results may differ materially from those expressed in such statements, depending on a variety of factors, including: the extent and duration of the impact of current market conditions including the significant drop in the oil price, the impact of COVID-19, overall global economic and business conditions impacting our business and demand for our products as well as the specific factors identified in the discussions accompanying such forward-looking statements; changes in consumer preferences and societal expectations; the pace of development and adoption of alternative energy solutions; the receipt of relevant third party and/or regulatory approvals; the timing and level of maintenance and/or turnaround activity; the timing and volume of refinery additions and outages; the timing of bringing new fields onstream; the timing, quantum and nature of certain acquisitions and divestments; future levels of industry product supply, demand and pricing, including supply growth in North America; OPEC quota restrictions; PSA and TSC effects; operational and safety problems; potential lapses in product quality; economic and financial market conditions generally or in various countries and regions; political stability and economic growth in relevant areas of the world; changes in laws and governmental regulations; regulatory or legal actions including the types of enforcement action pursued and the nature of remedies sought or imposed; the actions of prosecutors, regulatory authorities and courts; delays in the processes for resolving claims; amounts ultimately payable and timing of payments relating to the Gulf of Mexico oil spill; exchange rate fluctuations; development and use of new technology; recruitment and retention of a skilled workforce; the success or otherwise of partnering; the actions of competitors, trading partners, contractors, subcontractors, creditors, rating agencies and others; our access to future credit resources; business disruption and crisis management; the impact on our reputation of ethical misconduct and non-compliance with regulatory obligations; trading losses; major uninsured losses; decisions by Rosneft's management and board of directors; the actions of contractors; natural disasters and adverse weather conditions; changes in public expectations and other changes to business conditions; wars and acts of terrorism; cyber-attacks or sabotage; and other factors discussed elsewhere in this report, and under "Risk factors" in bp Annual Report and Form 20-F 2019 as filed with the US Securities and Exchange Commission.

This document contains references to non-proved resources and production outlooks based on non-proved resources that the SEC's rules prohibit us from including in our filings with the SEC. U.S. investors are urged to consider closely the disclosures in our Form 20-F, SEC File No. 1-06262. This form is available on our website at [www.bp.com](http://www.bp.com). You can also obtain this form from the SEC by calling 1-800-SEC-0330 or by logging on to their website at [www.sec.gov](http://www.sec.gov).

September 2020

# Our strategy – an IEC delivering solutions for customers



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I hope that video gave you a sense of delivery, scale and quality in our hydrocarbons business.

The Production and Operations organisation will play a leading role in delivering resilient and focused hydrocarbons - the third of the three strategic verticals you see here. In this role I am responsible for our operations across oil, gas and refining and for the financial results of our oil production business.

Joining me later in this session will be Dev Sanyal, Executive Vice President for Gas and Low Carbon Energy.

Dev will be discussing the links between our equity gas production and the low carbon electricity and energy strategic theme he covered yesterday.

But I want to open this session by highlighting that this is an exciting time for us.

Production and Operations is a new organization, bringing together all our hydrocarbon operations, with a renewed mission.

We will aim to:

- eliminate life changing injuries and the most serious process safety events
- and reduce emissions aligned with bp aims
- while delivering the energy the world needs
- transforming operations and cost efficiency
- and creating a more resilient portfolio through investment efficiency and high grading

We expect the result to be growth in EBITDA to 2025, making resilient and focused

hydrocarbons a key contributor to BP's transition from IOC to IEC.

# bp 2030 aims – resilient and focused hydrocarbons



## Continued rigour in safety and operations

- Eliminate tier 1 process safety events and life-changing injuries
- >96% oil and gas plant reliability<sup>1</sup> and refining availability<sup>1</sup>
- Oil and gas production costs to ~\$6/boe<sup>1</sup> by 2025



## Driving emissions down

- >15Mte reduction in Aim 1
- >125Mte reduction in Aim 2
- **Reductions** from electrification, energy efficiency, reduced flaring and portfolio
- **Methane measurement** by 2023 per Aim 4



## Focused oil, gas and refining portfolio

- Selective investment in a deep resource hopper
- Divest non-core assets
- ~1.5mmboed<sup>2</sup> oil and gas production
- Strong platform in Russia through Rosneft
- ~1.2mmbbl/d refining throughput
- **Top quartile** refining margins

Unchanged HSSE goals: No accidents, no harm to people, no damage to the environment

(1) bp-operated

(2) Excludes Rosneft

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This slide from our presentation on the fourth of August sets out the aims of our hydrocarbons business for the next decade – how we will implement the bp strategy and achieve the mission I just shared.

It's structured into three focus areas. These focus areas will be the framework for the remainder of the presentation.

Firstly, continued rigour in safety and operations.

Secondly, consistent with our aims, driving emissions down.

Thirdly, we aim to focus our portfolio and drive further discipline into our investment choices.

But before we dive into each of these areas I want to spend a moment talking about our new organization and the operating model.

A new organisation...

Building on

*111 years*  
of shared experience...

...and a new operating model 

Centralised and standardised  
(‘bp Solutions’)

Digitally enabled

Agile structure and  
ways of working

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For the first time in bp’s one hundred and eleven-year history, we have brought all our hydrocarbon operations together.

And I see Production and Operations as much more than the sum of its parts.

Bringing these teams together will allow us to learn faster and drive a safer, agile and resilient business.

For example, our oil and gas project team is currently supporting Gelsenkirchen refinery to deliver a major integrity project by bringing their recent brownfield experience to bear.

And we expect that sharing of experience and knowledge will flourish in the new operating model we are implementing, built on the following three new ways of working.

**First, what we call ‘bp solutions’, these teams** will be a centralised resource putting our best experts rapidly and effectively to work on our biggest risks and biggest opportunities.

This approach is a natural evolution of our existing functional organization and there’s plenty more running room in this concept.

One place we’ll apply this approach is in managing facility turnarounds. We currently have several teams for oil and gas and one team in every refinery using different processes to manage the same scope. These teams will be replaced with a single team and a single best process that we will apply to delivery of each turnaround.

And in our offshore operations – imagine experts from many countries coming together in a digitally enabled way to design and deliver our most challenging wells with improved safety and efficiency. That’s actually real and happening now – we’ll show a short video later with this in action supporting our Indonesian drilling campaign

**Second, all our teams in Production and Operations will be digitally enabled.** We’re

investing to give our teams access to the highest value data. And using digitally enabled workflows to give them structure and access to the right expertise and information at the right time. Again – a real example – maintenance and inspection is being planned centrally, using digital twins to visualize the work site remotely. And when the work is carried out, connected employees use mobile and wearable technologies to implement the plan, and access up to date information and remote expertise.

**And third, we're adopting an agile organizational structure.** By "agile", we mean small cross-functional, digitally collaborative teams solving problems rapidly using agile tools and techniques. I believe we are the first energy company to organize in this way and doing so has performance benefits that will significantly differentiate us from our peers.

We have started in our Azerbaijan organization. A pilot at scale has delivered impressive results - a more motivated workforce with an expected 20% improvement in productivity, solving problems ever more safely.

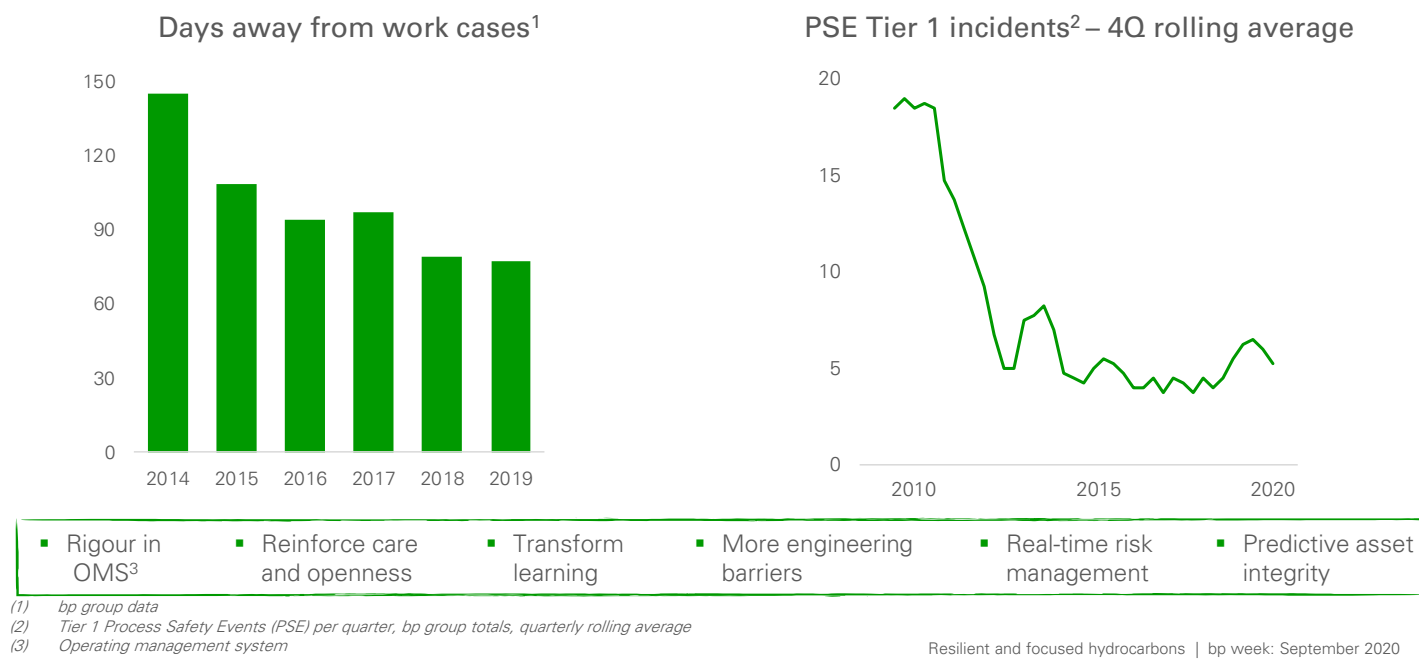
We've already provided training in agile practices to 2500 staff in the Production and Operations organization. Across bp, over the last two and a half years, we have supported nearly 900 agile projects with around 70 agile coaches.

And we've taken the opportunity to build our new organization with agile at its heart.

These three new ways of working which will underpin delivery of the cost and revenue improvement programmes I will discuss shortly.



# Ambition – no Tier 1 process safety events or life changing injuries



Now, to go deeper into the three focus areas. The first is rigour in safety and operations.

In our industry, accidents can destroy lives and damage environments.

This is why safety is a core value and our focus on this is unwavering.

The left-hand graph on this slide shows the number of people each year who were injured seriously enough that they could not report for their next shift.

Year-on-year, fewer people are being injured in our operational activities, which is a great outcome, and this looks set to continue for 2020. However, as we look at these graphs today, we must remember that each number is an individual who came to work and was injured. So we have more to do before everyone is returning to their homes and families safely.

The graph to the right shows the quarterly occurrence of our most serious process safety events. These are the unplanned releases of hazardous material with the potential for severe consequences. The trend had been downwards, but it has now plateaued and, if anything, has seen some deterioration recently. This is not acceptable to us.

Our ambition is to eliminate the most serious process safety events and life changing injuries. This would represent a major step towards our ultimate goal of no accidents, no harm to people and no damage to the environment.

Our strategy to deliver on this includes:

- Creating a single safety culture based on care, trust and transparency.
- Transforming how we learn through digitally enabled interactive learning.
- Applying more engineering barriers to reduce reliance on people and minimise the



likelihood of human error.

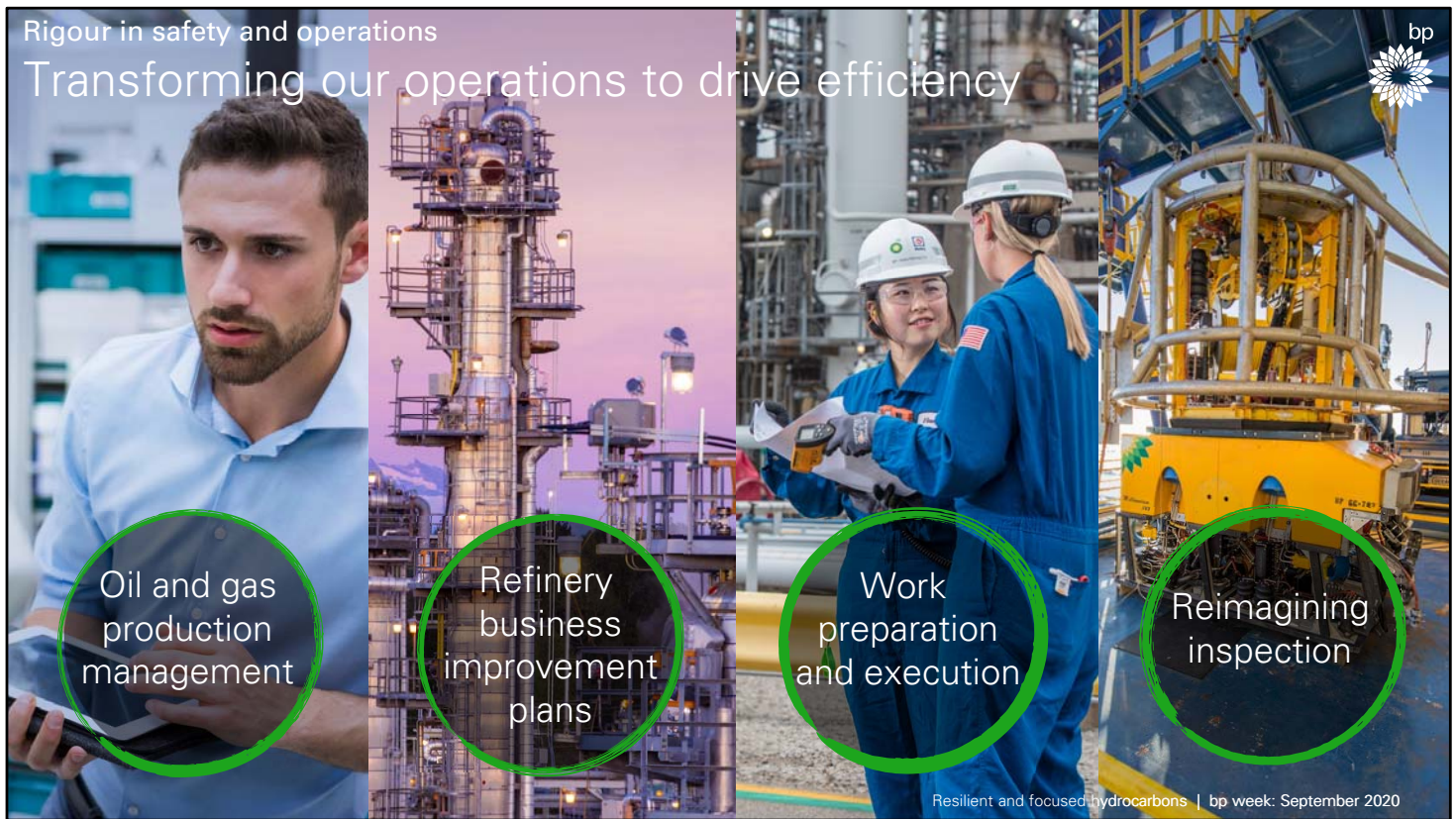
- Using real-time data and analytics to dynamically manage our biggest risks; and
- Predictive asset integrity techniques so we can identify and fix issues before they can result in an accident.

We will continue to systematically improve our operating management system, OMS, which defines the standards we strive for and how to achieve them. It is foundational to how we operate.

So it's a big agenda, but I want to make it real by giving you one example of a simple change that we are making.

Bringing all our operations together has given us the opportunity to harmonise our safety leadership principles which, in part, define our safety culture. We are embedding the behaviour of care and trust which promotes a speak up culture and helps us learn and improve. This harmonised approach to safety leadership will help us achieve our goals.

Our focus on safety will remain core to everything we do.



Turning from safety, we are strengthening four programmes which underpin our focus on operational excellence.

Together they will enable us to drive lower cash costs and increase revenue:

Firstly, oil and gas production management

Secondly, refinery Business Improvement Plans

Thirdly, improving Work Preparation and Execution

And finally, re-imagining our approach to our entire facilities **Inspection Programme**

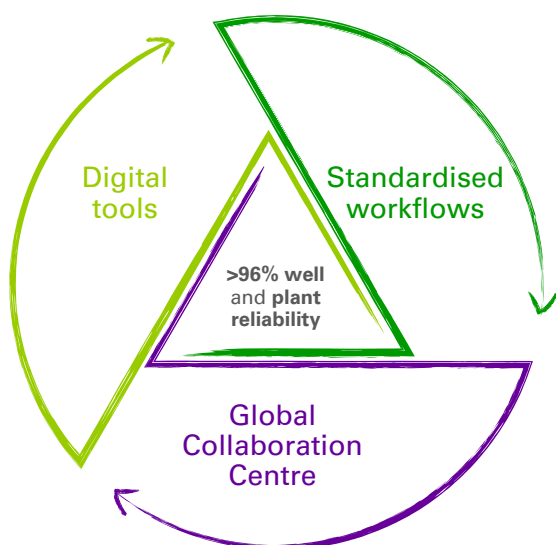
These programmes are heavily underpinned by digital solutions and you will hear more about the investments in Innovation and Engineering from David Eyton later.

I will now go into each of these four programmes in a little more detail.

# Maximising throughput and revenue

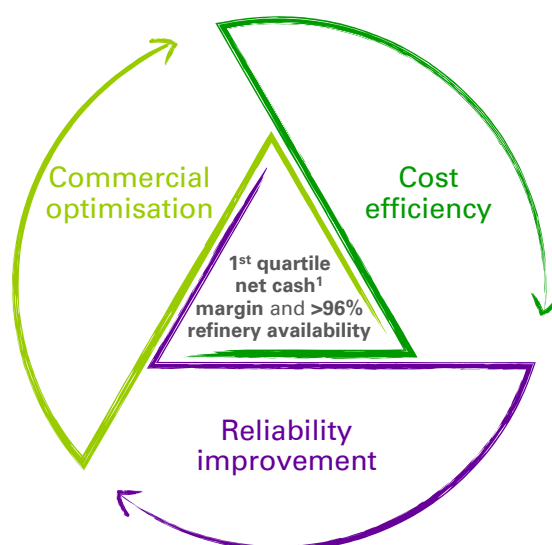


## Oil and gas production management Maximising production delivery



(1) Solomon net cash margin benchmarked

## Refinery business improvement plans Delivering competitiveness



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The first two programmes – one in oil and gas production, and one in refining - are focussed on growing volume and margin revenue but also have cost benefits.

### First, on production management in our oil and gas assets.

Across the industry, the lost revenue every year from deferred production – that is oil or gas shut-in for many reasons – is a huge prize. A 1% improvement in our overall operating efficiency was worth around \$150 to \$200 million of pre-tax revenue in 2019. We want to capture as much as possible of that deferred revenue.

Global and Remote Collaboration Centres, known as GCCs or RCCs, are at the heart of our approach.

These centralised co-located teams will provide integrated real-time support to on-site operations teams by continuously monitoring and optimizing our facilities worldwide.

They will have access to:

- real time digital field data
- world class simulation and optimisation tools; and
- specialised expertise.

Our wells collaboration centres are already operating and delivering substantial benefits.

The video I'm going to play now shows how we used our wells Remote Collaboration Centre in Sunbury to support a very successful drilling campaign in Indonesia.

### [Transforming operations video]

A great example of new technology combined with new ways of working delivering

exceptional results. And you can hear that our people are excited about working this way.

Wells are just the start – our next step is the establishment of production management Global Collaboration Centres. Gulf of Mexico is online already and North Sea and Azerbaijan will be in place by year end. These centres will help us make progress on the huge deferrals prize I quoted earlier.

## **Second, long-established refinery business improvement plans**

They have delivered sustained improvement in competitiveness of our assets. They focus on cost efficiency, reliability improvement, advantaged crudes, intelligent operations and commercial optimisation.

Our aim is to deliver:

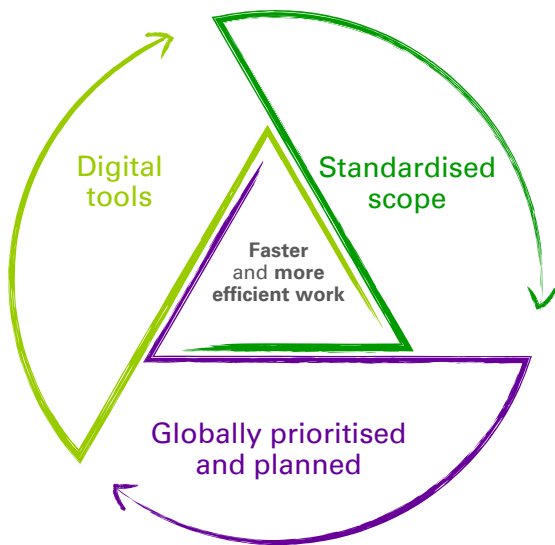
- More than 96% refining availability
- First quartile net cash margin in our portfolio; and
- Second quartile or better non-energy cash costs as measured by Solomon

Our refining teams have robust plans to improve our cost efficiency through procurement savings, improving productivity, and focused initiatives to reduce maintenance spend whilst improving reliability.

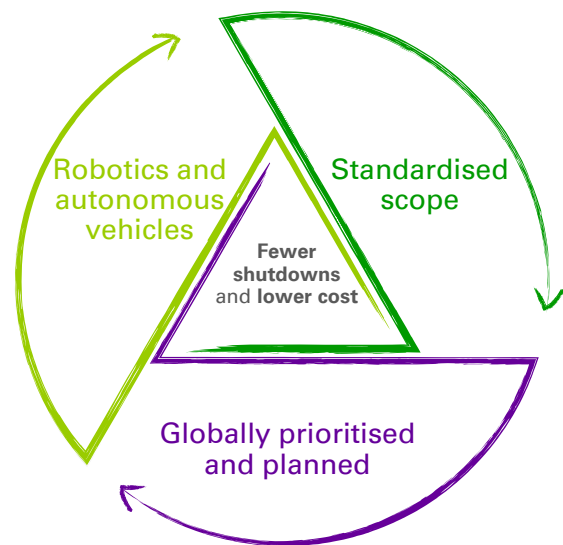
The business improvement plans have helped us deliver over \$1 billion underlying earnings growth since 2016.

One of the big success stories in refining is the turnaround of reliability at Whiting refinery which has improved from 94% Solomon availability in 2014 to more than 96% for three consecutive years since 2017.

## Work preparation and execution



## Reimagining inspection



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Turning to programmes three and four, both of which are currently focussed on oil and gas production, but have applicability to refining.

We spend around \$3 billion per year, gross, on inspection and maintenance in our hydrocarbon business. More than 400,000 maintenance and inspection work orders across that business per year.

That's a big spend, but also a big opportunity to deliver greater cost efficiency and higher revenues.

I know from personal experience how important this is. As a young engineer on a platform in the North Sea I remember very well trying to get jobs done when the work was badly planned, the materials weren't available and the permit to work had not been issued.

We got the job done in the end, of course, and things have improved since then, but our teams are sometimes still held back by many of the same issues.

Let me give you a couple of facts on why this matters:

- First, around 40% of the work we do has to be re-planned, and our likelihood for an incident increases when plans change
- Second, on average, even with current levels of reliability and availability, we have around 35 mboed of production shut-in because of problems we can fix, but haven't got to them yet. That's more than one million dollars of missing revenue per day.

Of course, these problems aren't unique to BP, but we intend to get after them.

Our third programme, **work preparation and execution** will see us undertake design of work, planning and prioritization centrally using standardised scopes of work.

We will use new digital tools to make execution of that work much more efficient, for

example:

**Digital workflow tools** – that allow site managers and operators to track a defect from identification to elimination. They can plan, create work orders, and order parts - in a single digital tool.

**Connected workers** – I mentioned this earlier – brings mobile, wearable and voice technologies to the working environment making work activities such as inspection effective and efficient. A pilot at one of our refineries showed positive results with a projected 3500 hours of annualised productivity savings.

**3D worksite visualization** – these are digital twins that allow central teams to plan maintenance – identify obstructions, collect measurements, and define the steps to do the job – without ever setting foot on site.

**And the last of these four programmes, re-imagining inspection.** To give you a sense of scale, we have around 21 million individual locations across our business that have to be inspected.

Getting this right draws on two enablers which I've already mentioned in relation to work preparation and execution: centralised prioritization and standardising scope

And the third leg of our inspection programme is new technology, often deployed with robots or autonomous vehicles.

Using sensing technology, we've moved from manual internal inspections of pressure vessels, to 85% of those inspections being executed with the vessel still operating. That reduces disruption to operations and production deferrals.

We are starting to use the big data gathered by these types of sensors and machine learning to target our inspections and give us higher 'find-rates' based on past results. We have already had some significant successes piloting this in the North Sea.

Additionally, we are in the early stages of using machine processing of inspection images instead of relying on the human eye. We see potential to greatly improve accuracy, increase processing capacity and reduce cost.

And we are increasing our use of robotics.

Firstly for inspection in remote locations – like over the side of offshore platforms.

Secondly, for maintenance.

For example, robots in the Gulf of Mexico are now working on our platforms doing routine jobs like painting.

And we're already making significant use of autonomous vehicles – underwater, on the surface, and in the air – to inspect our facilities.

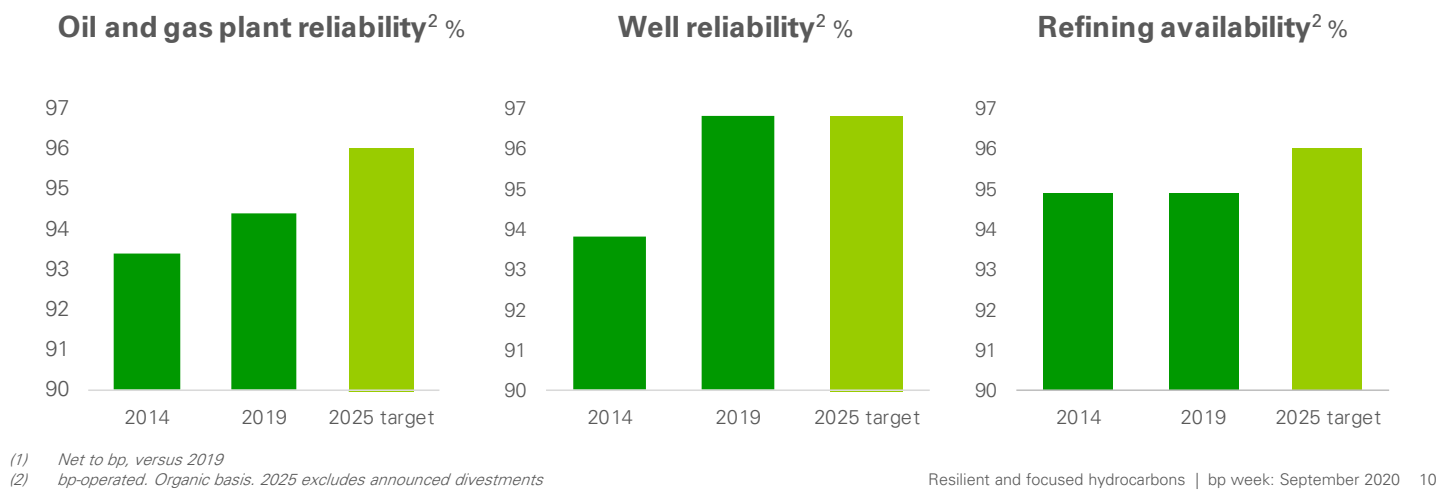


**>\$1.5bn**

of annual cost savings in our hydrocarbon business by 2023<sup>1</sup>

**96%**

oil and gas plant and wells reliability and refining availability by 2025<sup>2</sup>



Our new organisation combined with the four programmes I have just described will drive cost efficiency and reliability and grow value.

First we expect to deliver \$1.5 billion of annual cost savings from our hydrocarbon business by 2023. This will be generated through synergies driven by cost reductions from a simplified organization, zero based budgeting, digitisation and supply chain efficiencies.

Second, we plan to grow value by driving reliability improvement across our oil, gas and refining operations.

On the left of this slide, oil and gas plant reliability reflects the impact of unplanned process plant downtime on our production rate.

Between 2014 and 2019, we improved plant reliability by one full percentage point. That's equivalent to nearly \$200 million of additional revenue in 2019 compared to our 2014 performance level.

And our goal is to increase plant reliability by a further 1.6% to 96% by the middle of this decade.

In the middle, well reliability reflects the impact of unplanned well downtime on our production rate. The 3% improvement over the same five year period contributed nearly \$600 million of incremental revenue in 2019 alone.

Our goal is to maintain that same high level of well reliability out to the middle of the decade.

Lastly, refining availability.

A 1% improvement in availability is equivalent to \$50 to 100 million gross margin per year with our current refinery portfolio.

Our average Solomon availability since 2016 is around 95%.

4 out of the 8 operated refineries delivered an average of more than 96% availability across 2018-19.

Our ambition is to achieve 96% Solomon availability across the portfolio by 2025.

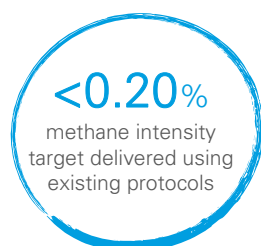
We will pursue this through rigorous deployment of defect elimination, integrity management and intelligent operations as laid out in Business Improvement Plans.

I believe that these four programmes will reduce cost, improve revenues and make our hydrocarbons business significantly more resilient.

# Delivering Aim 1 and 4 reductions



## A track record of delivery

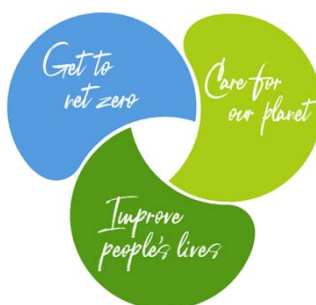


## Focusing our delivery

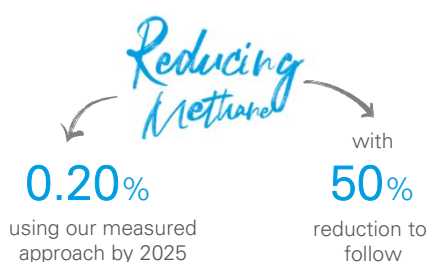
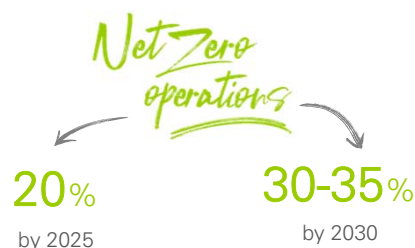
Strengthening our capability

Integrating new solutions

Supporting our  
sustainability frame



## Guided by our aims and targets



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## Moving to the second focus area – driving emissions down

We spoke to this area at length on day one, but I want to re-emphasize that reducing emissions, and support of our wider sustainability framework is core to resilient operations. We are focussed on achieving our targets under Aims 1 and 4.

Aim 1 - a 20% reduction in our operational emissions by 2025

Aim 4 – applying our methane measurement approach by 2023, pursuing a 50% reduction in methane intensity based on that measurement approach, and as an interim step, targeting 0.20% methane intensity or better by 2025 – again, using that measurement approach.

I outlined on day one our strong track record of delivery on our aim 1 and aim 4 activities. We will build on that track record to further underpin our 2025 emissions reduction targets.

# A strong portfolio with opportunities to transform



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I'm going to turn now from reducing emissions to look at the third focus area, our hydrocarbon portfolio and investment approach.

We have a strong asset portfolio, with three key elements:

- Firstly, our strategic investment in Rosneft;
- Secondly, a diverse and balanced portfolio of high-quality oil and gas assets; and
- Thirdly, an advantaged refining portfolio.

So we are building from strong foundations.

And in this section we will set out how we intend to strengthen it further over the next decade, by focusing our assets and maximising value through margin expansion and investment efficiency.

# Rosneft – a material investment with good strategic fit



## Aligned with bp strategy

- Resilient hydrocarbon production
- Low cost of supply  
~\$3/boe operating cost<sup>1</sup>
- Tax regime supports resource development
- Strategic co-operation includes HSE, gas, seismic

## Reducing environmental impact

- Committed to UN's Sustainable Development Goals
- 3.1Mte CO<sub>2</sub>e reduction<sup>2</sup>
- 14% energy efficiency improvement<sup>2</sup>
- Oil and gas fugitive methane emissions down 73%<sup>3</sup>

## Material contribution

- \$785m dividend received in 2019
- \$3.95bn dividend paid since 2013
- 1.1mmboed production and ~8bn boe proved reserves<sup>4</sup>

(1) 2019 in-year cost  
(2) 2018 and 2019 combined  
(3) 2019 versus 2018  
(4) 2019 production and year-end reserves

Taking Rosneft first. This is an investment we are proud of.

It's a strong strategic partnership.

Rosneft's production has a very low cost of supply, making it resilient to the energy transition.

And the Russian tax regime also adjusts effectively to allow its fields to be developed.

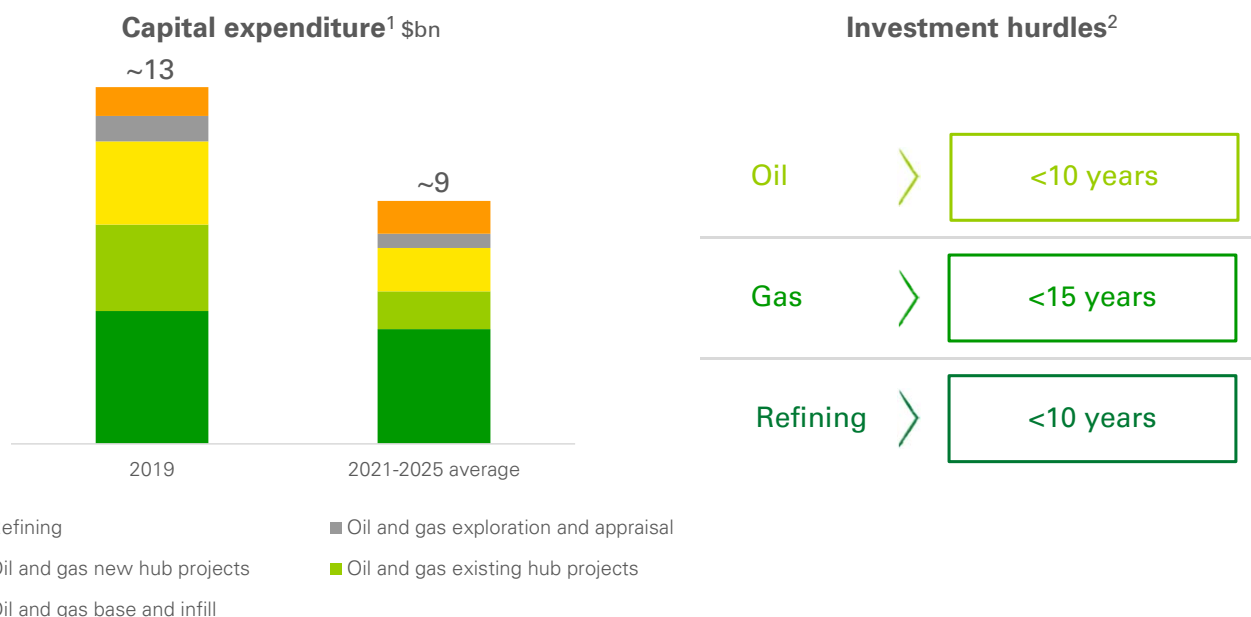
Like bp, Rosneft is committed to a more sustainable approach to oil and gas development.

Rosneft:

- has committed to the UN's sustainable development goals
- has delivered three million tCO<sub>2</sub> equivalent reduction to date, with a particular focus on energy efficiency; and
- and is making strong progress on reducing fugitive methane emissions.

Lastly, our Rosneft investment is material for bp. The track record on dividends paid to bp, the production that underpins that dividend, and the reserves hopper speak for themselves.

# Disciplined investment with clear criteria



(1) Organic cash capital expenditure  
(2) Discounted payback at central investment appraisal price case including carbon price

Next, I want to spend some time speaking to the other parts of our hydrocarbon portfolio including our approach to capital allocation.

Our financial frame has us – on average - spending 30% less per year over the five-year period to 2025 than we did in 2019.

But we are absolutely not starving the business of investment.

We can do this because we are coming off a period of high investment in oil and gas hubs.

And our focus can now shift to more efficient tiebacks, infill drilling and other near-hub options.

Combine that shift in chosen options with a strong track record of improving project delivery, and capital productivity will improve significantly.

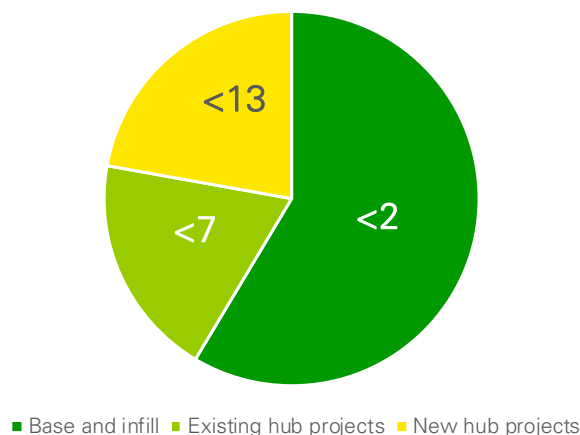
Each of the projects we sanction will be tested against our new price deck, including a revised carbon price for operational emissions.

They will need to meet the strict payback hurdles we show here as well as addressing the other criteria in our investment framework. Murray will talk more about this later.

## A deep hopper of attractive investment options

- 6bn boe booked PD reserves
- 16bn boe of resources<sup>1</sup>
- Development cost ~\$9/boe<sup>2</sup>
- Average payback<sup>3</sup> ~5 years
- Driving value through choice
- Proved R/P declining – aligned with strategy

**Paybacks on 2021-2025 capital expenditure**  
years<sup>3</sup>



(1) Currently selected in business plan

(2) Point forward development capital divided by total proved developed reserves additions

(3) Exploration and refining excluded, payback at bp cost of capital and central investment appraisal price case including carbon price

Focusing now on oil and gas production and our resource hopper.

We have just under six billion barrels of proved developed reserves booked at the end of 2019.

And we have 16 billion barrels of oil equivalent of options currently in our business plan, roughly 50 / 50 oil and gas, at a point-forward development cost of around \$9 per barrel of oil equivalent.

That development cost is 40% lower than our 2019 unit depreciation rate of around \$16 per barrel of oil equivalent.

The options in our plan are equivalent to over 20 years of investment choices focused on the most margin accretive options, with a 5 year average payback and high returns.

So we have quality through choice.

It means we don't have to explore, although a focused exploration programme can deliver higher margin barrels, displacing other options.

We don't need to acquire resources and we have considerable flexibility on divestment

And we'll plan to manage our total proved reserves to production ratio down to around 8 years which maintains a healthy balance.



## A focused approach to exploration



No new country entry

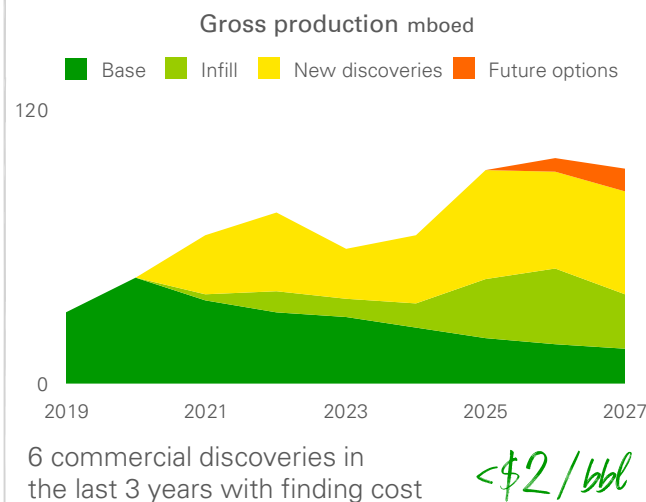
Focus on new hubs in existing producing areas and near hub tiebacks

Overall exploration capital declining to \$350-400m

Building on a great track record in near-hub exploration

350mmboe and \$1.2bn of value added in near-hub exploration<sup>1</sup>

### Case study: Na Kika, US Gulf of Mexico



(1) 2016 to mid-2020; NPV at at \$50 bbl (2015 real and cost of capital after deducting E&A spend)

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Reflecting our net zero ambition and aims, we have taken a hard look at the role of exploration in our oil and gas business.

We've been clear that, point forward, we don't intend to enter new countries for exploration.

Our exploration and access capital spend has already reduced from a peak of roughly \$4.6 billion in 2010 to around \$800 million in 2019 and, over time, we expect it to reduce further.

But, as I've just said, exploration can still deliver high quality resilient projects.

So we'll continue to selectively explore for new hubs in core regions while focusing most of our exploration spend near to our existing hubs.

Our track record shows that discoveries from these near-hub wells will typically yield high-quality low-cost resource which makes effective use of our past investment.

We currently have a risked hopper of near-hub exploration of around 400 million barrels of oil equivalent net to BP – and that's a hopper that we regularly refresh.

As an example of this approach, over the last 3 years we have carried out a very successful programme of near-hub exploration on the Na Kika asset in the Gulf of Mexico.

This is an asset with a capacity of around 130 thousand barrels per day but production was down at around 40 thousand barrels per day.

Since then, our technology-led exploration efforts have generated six commercial discoveries with over 85% success rate, and a finding cost of less than \$2 per barrel.

To achieve this we used technology such as:

- Advanced seismic algorithms to improve image quality

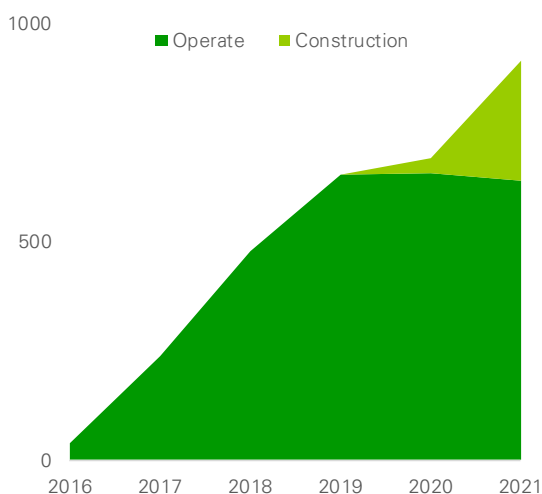
- Full wave form inversion models; and
- Machine learning to predict rock and fluid properties

We expect Na KiKa to be at close to 100 thousand barrels per day production by 2025 and these technologies to be used throughout the portfolio.

# Major projects on track for 900mboed in 2021



## Major project production<sup>1</sup> mboed



(1) Organic basis, pre-divestments

## Track record of delivery

25

major projects  
online

Producing

700mboed  
at end-2Q 2020

Delivering

900mboed  
by end-2021

### > 2020

- Atlantis Ph3
- KG D6 R-Series
- Vorlich
- Raven
- Khazzan Phase 2

### > 2021

- KG D6 Satellites
- Thunder Horse South Expansion Phase 2
- Manuel
- Zinia 2

### > 2022

- Mad Dog Ph2
- Herschel
- KG D6 MJ
- Matapal
- Platina
- Tangguh Expansion
- Cassia Compression

### > 2023+

- ACE
- GTA Phase 1
- Cypre
- Seagull

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I want to say a little more on the major projects underpinning our profile.

We're still on track to deliver 900 thousand barrels per day from major projects by the end of 2021.

As we've said before, these are high margin barrels, with cash margins roughly 35% higher than the base business we had in 2015.

We expect to sustain that level of production from our major projects out to 2025 at least.

Since we last spoke to you Atlantis Phase 3 has started up successfully, on time and on budget, so we now have 25 major projects on-line. A great example of the sort of fast payback, high return tie-back opportunity which will be at the heart of our projects hopper going forward.

Before the end of 2020 we expect to start up Raven in Egypt and we are planning for the accelerated start up of Ghazeer in Oman.

As a result of COVID-19 we now expect Mad Dog 2, Cassia Compression in Trinidad and Tangguh Expansion Project in Indonesia to start in 2022.

And turning to bp's integrated capability, in the future we will be deploying our project capabilities across the Group on low carbon projects – in fact we've already started doing that.

I'd now like to show a short video that illustrates how we are thinking about development concepts for our next wave of projects. The Cypre installation in Trinidad and Tobago is a great example of how a radical approach has led to a lower cost, safer, lighter, cleaner platform. The team will share our overall thinking on this and will talk about that installation specifically.

## [Facility of the future video]

I think that's a great example of how we're thinking differently about our new facilities. These are concepts that combine cost efficiency with a more sustainable approach, while reducing risk to our teams. There is enormous potential to leverage this approach across our portfolio of future near-hub developments.

# Project delivery underpinned by best in class preparation<sup>1</sup>



		Reservoir FEL <sup>2</sup>	Facilities FEL <sup>2</sup>	Wells FEL <sup>2</sup>	Cost target	Schedule target
<i>best in class</i>						
Quartile	1st					
	2nd					
	3rd					
	4th					

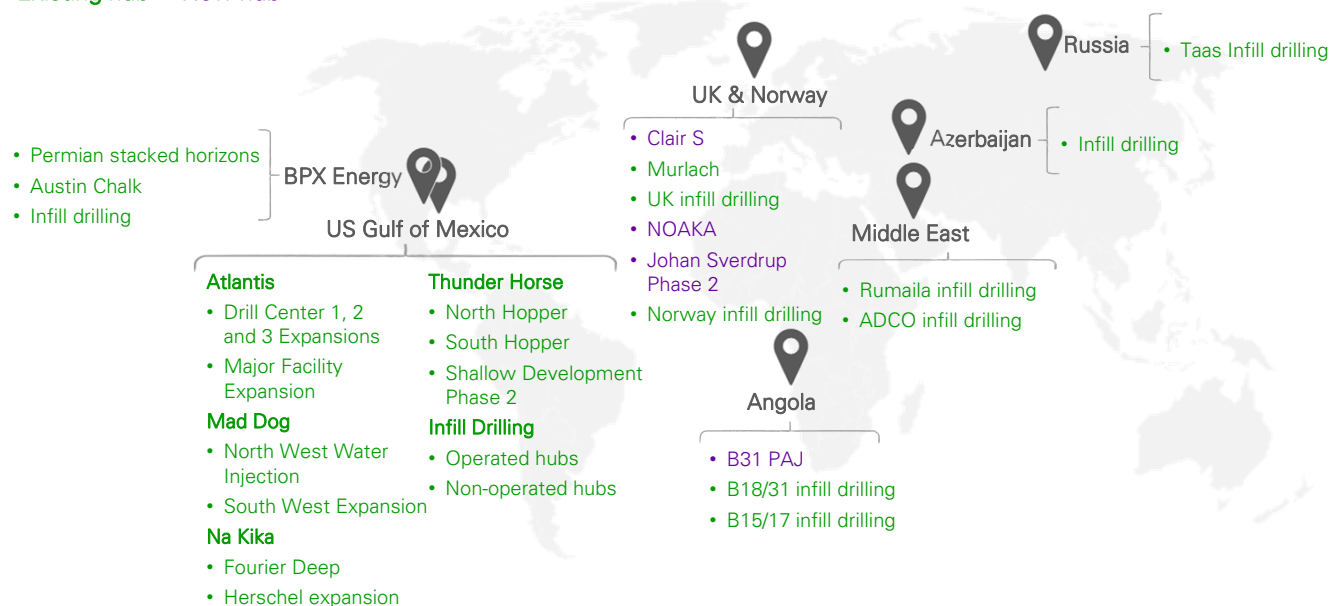
(1) Independent Project Analysis, Inc. annual benchmarking consortium 2020 (UIBC 2020) meeting, bp ongoing projects  
 (2) Front end loading

And we have confidence in future project delivery. I'm very proud that our project teams have been recognised within IPA's Upstream Industry Benchmarking Consortium as best in class on the metrics that test readiness for project execution – Front End Loading and setting cost and schedule targets. Great preparation supports great outcomes.

# Oil investment options leveraging existing infrastructure



• Existing hub • New hub



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So where do we see the next wave of oil investment?

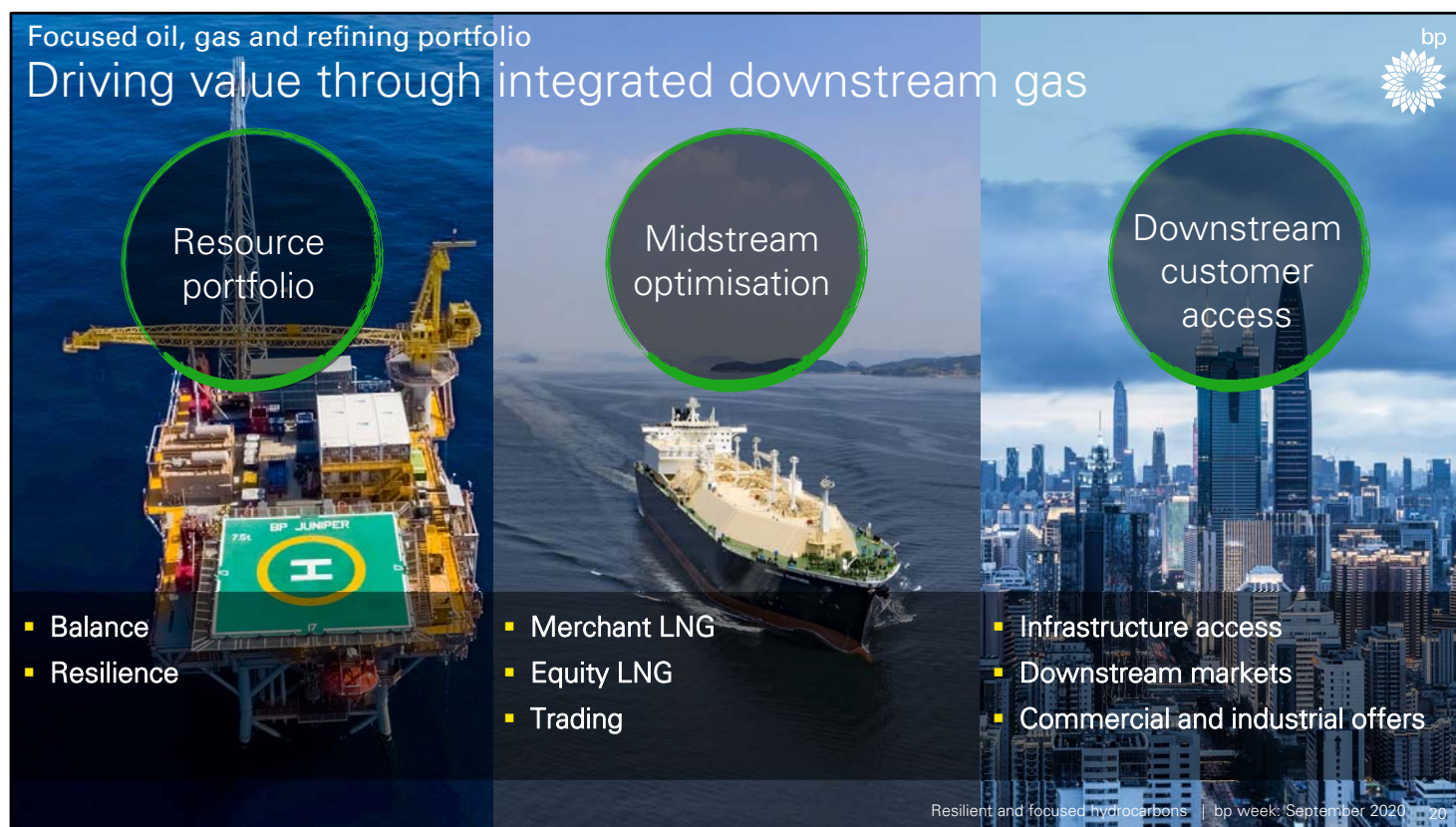
This chart identifies some of the oil opportunities we intend to evaluate for progression into our major projects scope as well as areas with significant fast payback infill drilling.

Dev will show the equivalent gas list in a minute.

For oil, almost all of the strongest opportunities that would fit within our capital frame are tie-backs or infills. There is also a heavy weighting to highly resilient regions like the onshore and offshore US, although other regions also exhibit good options, particularly around infill drilling.

As you can see, we have plenty of choice. Around eight billion barrels of oil options in our plan and other options being evaluated. This demonstrates the opportunity we have to apply strict return and payback hurdles to our capital allocation process – and deliver increased cash margins.

And now I'm going to pass you over to Dev Sanyal for a few minutes - Dev's going to share some insights on the role of gas production within our portfolio, and how it connects to his low carbon electricity and energy strategic theme. Over to you Dev.



(Dev speaks)

Thank you Gordon.

As I highlighted yesterday, we believe gas has an important role to play in the energy transition. We spoke about how we are building a business to capture downstream customers, taking advantage of our resource positions, and combining this with our trading capability.

We see a partnership between gas and renewables to create firm and affordable energy. Over time, the decarbonisation of gas will also enable the creation of hydrogen markets.

Global gas demand is expected to grow by 1.1% per annum through 2035 in the Rapid scenario which Spencer described on Monday.

We have material equity gas positions with approximately 120 trillion cubic feet of net discovered resources and close to 8 billion cubic feet per day of production in 2019. This will remain a resilient source of EBITDA.

Our gas positions are balanced across hubs, LNG, and domestic markets. Today our portfolio is split a third across each of these.

This diversification creates resilience to different price environments. In addition, it enables us to optimise across the global portfolio.

Our portfolio has a competitive cost of supply on average.

Our domestic gas positions, like in India, have strong demand growth and represent the most attractive alternative to internationally priced LNG imports.

We also have an equity LNG position of 15 million tonnes per annum, managed by Carol's team. This provides access to global markets, and enables us to optimise our customer



supply.

# High-grading the next phase of gas investment



- Domestic markets
- International markets



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On this map you can see the gas investment options in our hopper. We will take investment decisions through three important lenses.

Firstly, advantaged access to existing infrastructure, which leads to a low cost of supply.

Secondly, opportunity for integration into new downstream markets

And thirdly, the potential to decarbonise.

Let me now describe in more detail some of our positions and the next wave of opportunities.

In Indonesia, through our Tangguh project, we are the largest LNG producer in that country with 37% of Indonesia's production. Our two trains, soon to be three, provide material cash flow from an advantaged base. For the future, we have low cycle time options to build on existing infrastructure.

Oman is a material resource base with stable cash flows. It has a low-cost base which will improve further as we bring Ghazeer online - increasing production by 50% but only increasing costs by around 15%. We have further options that will support a 1.5 billion cubic feet per day plateau over at least the rest of the decade.

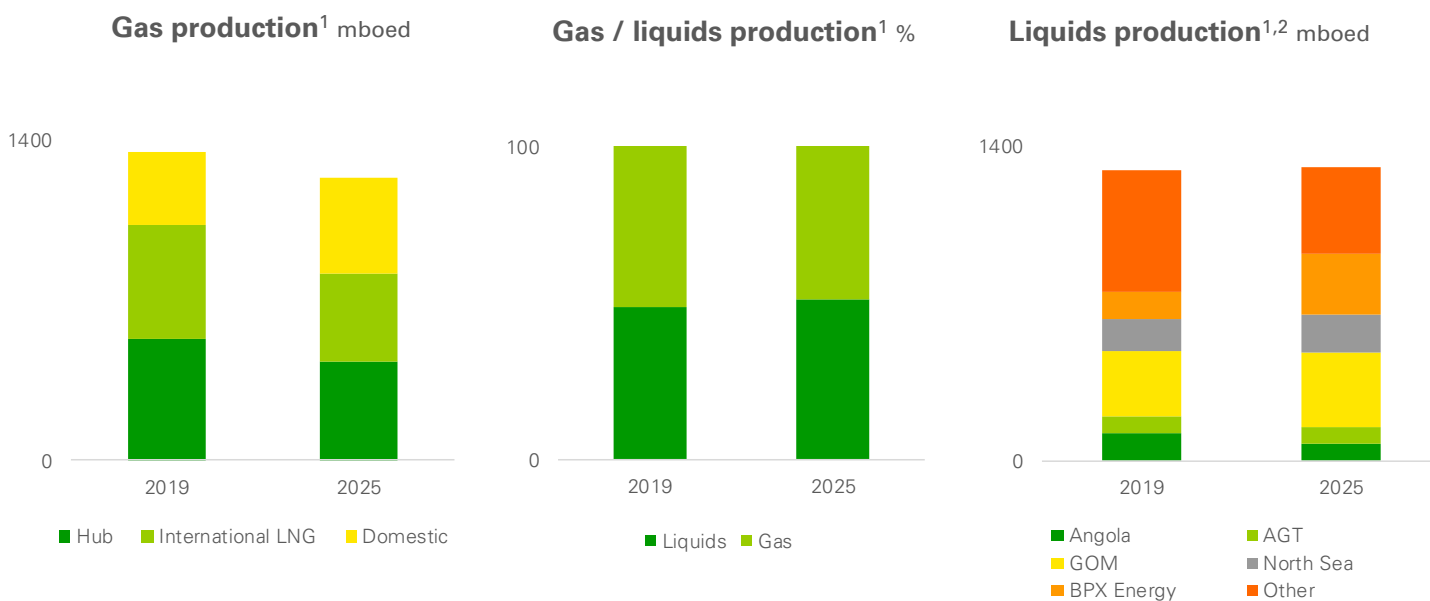
In Australia, we have a material position in the North West Shelf with five LNG trains producing 3 billion cubic feet per day. This is an important cash generator. We intend to optimize existing infrastructure through a combination of infill drilling, near-hub exploration and third party gas.

In Egypt, we have an established position in a market that continues to grow. Further exploration opportunities will continue to capitalize on existing infrastructure.

And we will continue to seek options to reduce operating emissions from future projects.

You would have seen the example from Cypre in Trinidad earlier.

# Investment decisions drive resilient production outlook



(1) 2025 excludes announced divestments  
(2) Oil plus natural gas liquids (NGLs)

We spoke about the balance in our portfolio through exposure to different price environments. This provides stability and predictability with exposure to international price upside. We will seek to maintain this balance. We will also seek to maintain the balance of oil and gas production at roughly 50:50.

Finally, I would like to reiterate three messages:

- First, we expect gas demand to keep growing and it will play an important role in the energy transition
- Second, our portfolio is balanced and resilient, delivering strong EBITDA; and
- Third, we have a strong set of options that capitalise on existing infrastructure and are connected to growing markets.

I will now hand back to Gordon to talk about oil.

**(Gordon speaks)**

Thank you Dev.

And to finish off the last graph on this slide, we have underlying liquids production on the right-hand side. Broadly flat from 2019 to 2025, although we do expect to divest some lower margin volumes in line with our overall intent on portfolio focus. But I do want to highlight the growing absolute liquids volumes from high margin regions like the Gulf of Mexico and BPX Energy.

## BPX Energy – high quality US onshore position



**bpx energy**

### Transformation ahead of plan

- 2021 synergies expected to be ~15% ahead of \$350m target
- High-graded oil focus in Permian and east Eagle Ford
- High-graded gas focus in west Eagle Ford and Haynesville
- Exited 2 legacy basins

### High quality resource development

- Early success appraising additional zones in the Permian and Eagle Ford
- Targeting >30% post-tax returns at \$45/bbl WTI and \$2.50/mmBtu Henry Hub

### Delivering growth with flexibility

- Short-term capital reduced to preserve cash in low price environment
- Business breaks even at \$35/bbl WTI and \$3/mmBtu Henry Hub in 2021

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Speaking of which, let me turn now to one of our key assets, BPX Energy, our Lower 48 business, where our post-acquisition transformation is ahead of schedule.

It's a good asset to close this section on, because it exemplifies some of the key attributes we're looking for – flexibility on pace and timing of investment, fast paybacks on individual wells, material contributions to oil and gas with ability to flex between them.

We are achieving early success expanding our resource base, for example through delineation and appraisal of the under-developed Wolfcamp B and Austin Chalk horizons.

And the team are applying rigorous investment hurdles.

The team's robust capital allocation process identifies opportunities which exceed a 30%, after-tax, rate of return at \$45 per barrel WTI crude price and \$2.50 per mmbtu Henry Hub gas price.

They currently have nearly two thousand economic drilling locations which meet or beat those hurdles.

Capital efficiency improvement was a major focus of the BPX team in 2019.

Relative to 2018, 2019 unit development costs fell nearly 60% – including around a 40% reduction in well costs complemented with a 40% improvement in expected ultimate recovery from our wells, on average.

They are also ahead of plan delivering the acquisition synergies we previously set out, and our divestment programme allows us to focus our capital on the highest margin and most resilient resources.

Considerable flexibility over the pace of investment is a clear benefit.

For example, to preserve cash in the current challenging price environment this year the

team went from 14 rigs operating to a single rig within a three-month period.

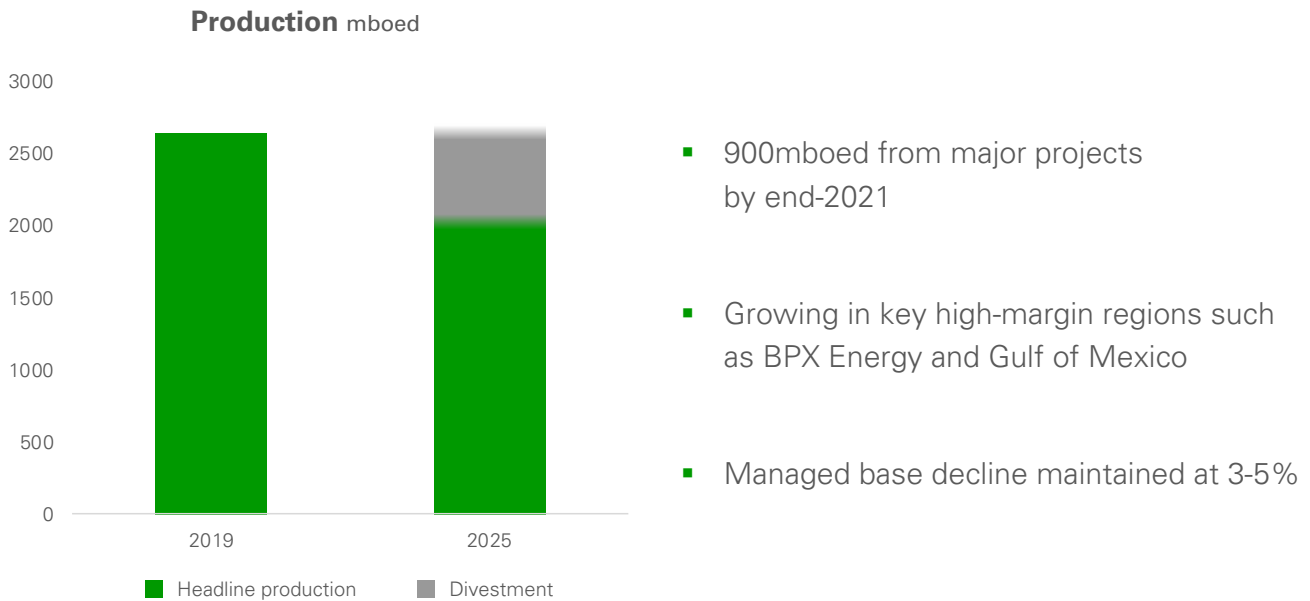
And they are working to reduce environmental impact. Permian flaring intensity has been cut from 16% in 2Q19 to 7% in 2Q20.

And there's more to be done – I know the team are focusing on achieving 2 to 3% or better.

All this leads to a business that plans to break even at \$35 per barrel WTI crude price and \$3 per mmbtu Henry Hub gas prices in 2021.

So we're making real progress in a great asset.

## Major projects and key regions offset base decline



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So to summarise these oil and gas building blocks, you can see in this plot our total production, comparing 2019 to 2025.

We expect to sustain underlying production broadly flat out to the middle of the decade at around 2.6 mmboed.

And we intend to divest around 600 thousand barrels oil equivalent per day by 2025, of which nearly 200 thousand barrels of oil equivalent per day are from already completed divestments.

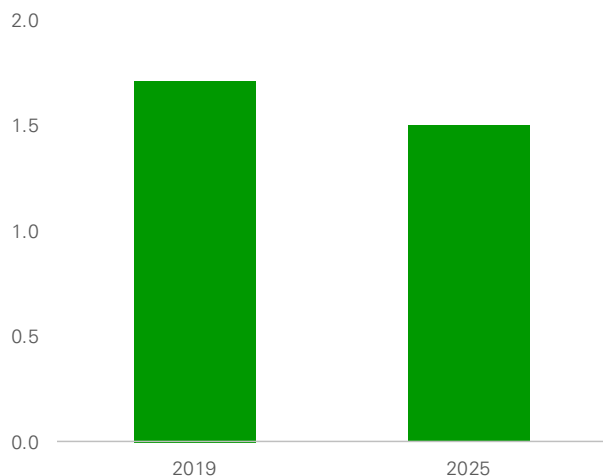
We expect managed decline in base production to stay within our 3 to 5% guidance out to 2025.

And overall, we expect a favourable evolution in the production mix, creating a more resilient portfolio.



## A resilient and high-graded refining portfolio

Refining throughput mmbbl/d



Success factors

Advantaged configuration

Reliability and efficiency

Advantaged crude

Commercial optimisation

Intelligent operations

*Top quartile*  
Net Cash Margin<sup>1</sup>

(1) Solomon net cash margin benchmarked

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Turning to our refining portfolio.

As I said earlier, we are pleased at the performance and progress of our operated refineries.

In the 2018 Solomon review, five out of eight of our operated refineries were in the top quartile for net cash margin.

And we have plans to move our refining portfolio as a whole to top quartile net cash margin by 2025.

In a similar way to our oil and gas assets, we intend to high-grade the portfolio over time through divestment of assets to focus on delivering earnings growth and decarbonisation.

That means that we plan to reduce refining throughput from roughly 1.7 million barrels currently to around 1.5 million barrels by 2025.

So, I hope you'll agree that we start from a strong platform - we have already delivered two consecutive years of record throughput in 2018 and 2019.

We will continue to grow commercial value through campaign planning and margin improvement together with investment in digital and feedstock processing capabilities. These actions are all taken in collaboration with Emma's Customers and Products team, and Carol's Trading and Shipping team, organisations to make sure we grow earnings across the fuels value chain.

Our refineries are configured flexibly so they can process advantaged crudes – for example:

- Whiting has both capability and access to process advantaged heavy grades of crude
- and Rotterdam refinery has access to waterborne crudes and proximity to equity

barrels with significant logistics advantages

We are also leveraging digital technology to improve almost every aspect of our decision making.

We have recently completed upgrading the digital software and models used by the traders and refinery planners to make swifter decisions on crude selection.

To give you some perspective, we buy and process more than 100 grades of crudes in our refineries in a year.

This tool enhances our analysts' ability to buy crudes that generate the most commercial value within the safe operating limits of our assets.

We are also developing digital solutions focusing on three key themes:

- world class productivity
- optimized production
- and plant availability.

We have been running pilots in these areas over the last 18 months.

As an example we have deployed a digital solution that improves predicted crude quality characteristics and will help to improve our refinery utilisation.

Finally, we will leverage our refining assets to process hydrogenated vegetable oil and waste oils to produce low carbon distillates – bio-diesel and bio-jet.

Bio co-processing is one of the key platforms to scale-up advanced fuels for our marketing businesses.

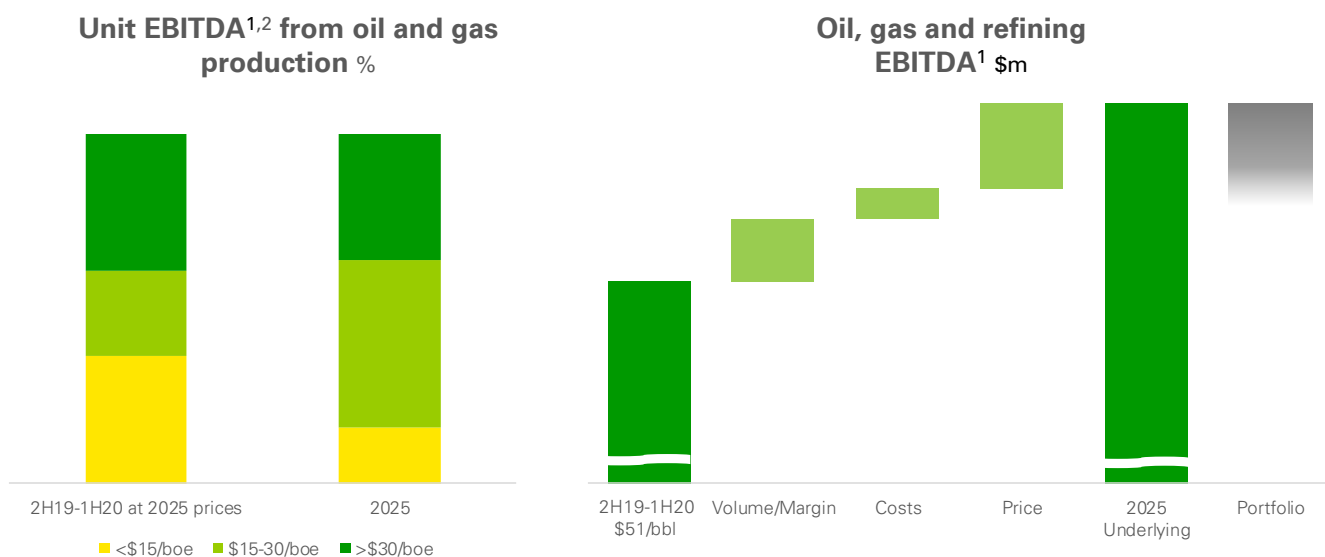
We will leverage trading and midstream to source cost advantaged feedstocks.

We will also make selective investment in fast payback capability that maximises co-processing margin.

We plan to grow the co-processing volume by nearly four-folds by 2025.

These commercial optimisation actions will underpin the delivery of first quartile net cash margin of our refining portfolio.

## Growing EBITDA from a high-graded, higher margin portfolio



(1) EBITDA: underlying replacement cost profit before interest and tax, add back depreciation, depletion and amortization and exploration expenditure written-off (net of non-operating items), excluding trading. At \$50/bbl Brent (2020, real) and \$3.00/mmbtu Henry Hub (2020, real), RMM \$12/bbl (2020, real)  
 (2) 2025 reflects planned divestments

I want to summarise by showing how each of the elements that I have covered today come together to make a more resilient higher margin portfolio.

On the left hand side, the graph shows how we expect average oil and gas unit margins over the first half of the decade to increase as a result of:

- our investment choices
- portfolio choices
- and cost and operating efficiency improvements.

And on the right, the changes within our control drive growth in EBITDA of around 20%. We expect further growth as the impact of COVID eases at our price and margin assumptions, with leverage to higher prices.

After offsetting divestments, we still see growth in EBITDA to 2025 – and that brings me back to the mission I described at the beginning of this session.

# Maximising value from a resilient and focused portfolio



Upstream production (mboed)	<b>2.6</b>	<b>~2</b>	<b>~1.5</b>
Unit production costs (\$/boe)	<b>~7</b>	<b>~6</b>	
Plant reliability (%)	<b>94</b>	<b>96</b>	<b>&gt;96</b>
Refining throughput (mmbbl/d)	<b>1.7</b>	<b>&lt;1.5</b>	<b>~1.2</b>
Refining availability (%)	<b>~95</b>	<b>96</b>	<b>&gt;96</b>
Capital expenditure (\$bn)	<b>~13</b>	<b>~9</b>	

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I'm going to close with a couple of slides now.

This slide summarises the 2025 metrics which underpin our financial frame.

And it serves as a reminder of where we aim to get to in 2030.

I'm not going to repeat these – they were all set out in our 2Q strategy presentation.

# Resilient and focused hydrocarbons



- Aiming to eliminate life changing injuries and the most serious process safety events
- Reducing emissions aligned with bp aims
- While delivering the energy the world needs
- Transforming operations and cost efficiency
- Resilient portfolio through investment efficiency and high-grading
- Growing EBITDA to 2025

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At the start of this presentation I said I was confident that this new Production and Operations organization could deliver our renewed mission.

I hope that over the last hour I have demonstrated why, but most importantly how.

To reiterate what I said at the beginning, we will aim to:

- eliminate life changing injuries and the most serious process safety events
- and reduce emissions aligned with bp aims
- while delivering the energy the world needs
- transforming operations and cost efficiency
- and creating a more resilient portfolio through investment efficiency and high grading

As I said at the beginning of the session, we expect the result to be growth in EBITDA to 2025, making our hydrocarbons business a key contributor to BP's successful transition from IOC to IEC.

Thank you for your time and attention today.

I am now going to hand to David Eyton to talk about Digital and Innovation – an important enabler for my business.