Oil & Gas Authority

UKCS Production Efficiency Report

July 2020

UKCS Production Efficiency (PE) improved for the seventh consecutive year reaching 80% and achieving the UKCS PE target three years ahead of schedule. 80% production efficiency represents a five percentage point increase on the 2018 UKCS PE with 43% of UKCS hubs achieving PE of 80% or more. This is a significant achievement and reflects the continuing efforts by industry to improve operational efficiencies.

Production Efficiency (PE) is a core element of the industry production optimisation and asset stewardship focus which is vital to maximising economic recovery from the UKCS. Production Efficiency serves as a Key Performance Indicator (KPI) for the OGA as outlined in the Corporate Plan 2019 – 2024. The PE KPI target was set at an 80% UKCS Average Production Efficiency by the end of 2022.

UKCS Production Efficiency

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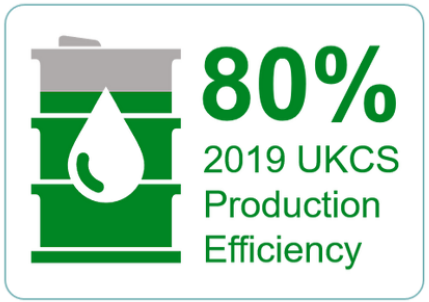
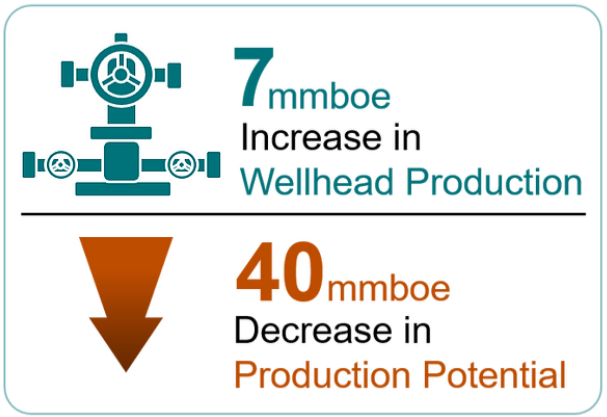
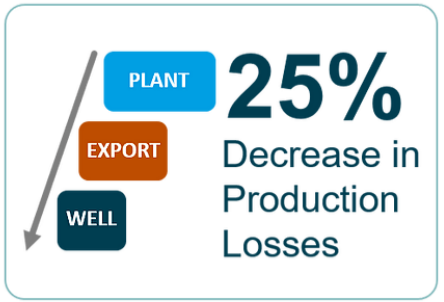
- **Overall 2019 United Kingdom Continental Shelf (UKCS) Production Efficiency (PE) hit 80%, achieving the OGA PE KPI target.**
- **Production increased by 1%, equivalent to 7 million barrels of oil equivalent (mmboe), while Production Potential decreased by 40 mmboe, a 4.8% reduction from the previous year.**
- **Total Production Losses decreased by 25% to 146 mmboe.**







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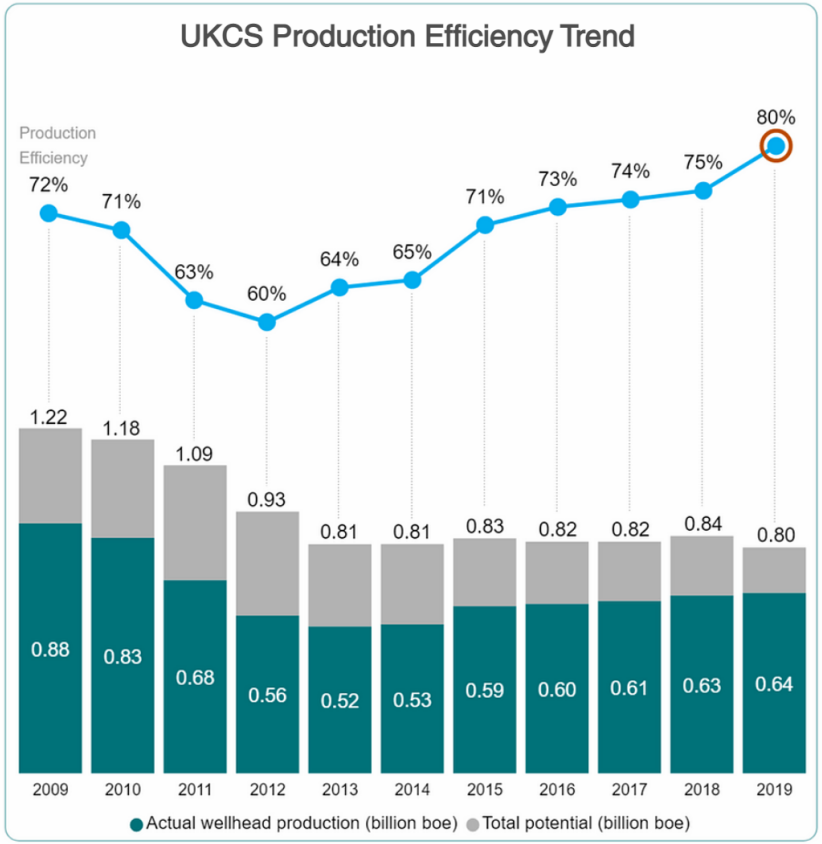

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Production Efficiency Model

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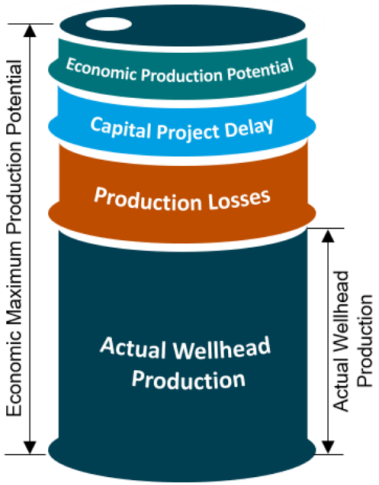
According to the Production Efficiency best practice guidance as utilised in this report, Production Efficiency is the total volume of hydrocarbons produced as a percentage of the theoretical economic maximum production potential.



$$\text{Production Efficiency (\%)} = \frac{\text{Actual Wellhead Production}}{\text{Economic Maximum Production Potential}}$$

UKCS PE TARGET **80%**

Regional Production & Potential Changes

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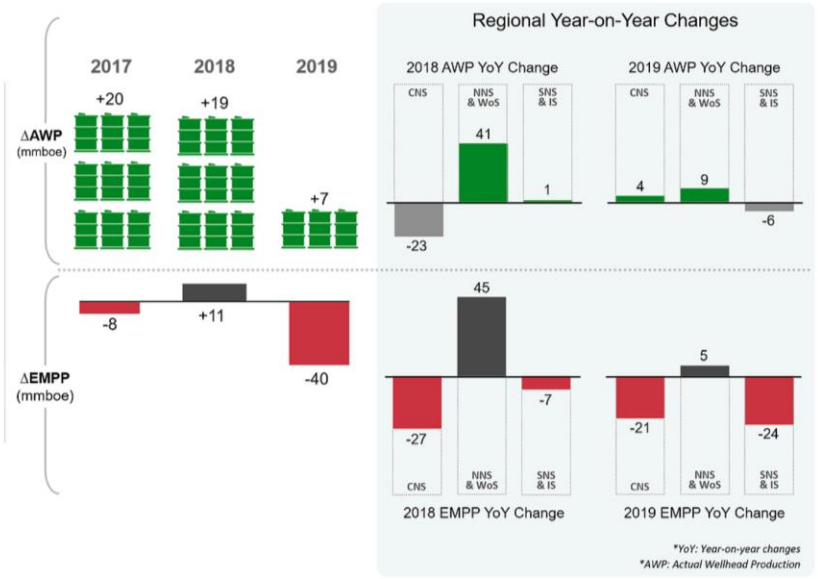
	2017	2018	2019
PE	74%	75%	80%
AWP	613	632	639
EMPP	828	839	799



Actual Well Production (AWP) rose marginally by 1% from 632 million barrels of oil equivalent (mmboe) in 2018, to 639 mmboe. This was accompanied by a 40 mmboe reduction in economic maximum production potential (EMPP) to affect the 5 percentage point increase in PE in 2019.

Regionally, the Central North Sea (CNS) and Southern North Sea (SNS) and Irish Sea (IS) regions experienced declines in EMPP, reducing by 21 and 24 mmboe, respectively. The Northern North Sea (NNS) and West of Shetland (WoS) region experienced a small increase in potential, leading to an overall net decline in EMPP. In 2018, the large 27 mmboe decrease in EMPP in the CNS area and combined smaller decrease in the SNS & IS region were counteracted by a significant increase in EMPP in the NNS & WoS region, largely as a result of new fields coming on stream.

UKCS Production Efficiency – Area Trends

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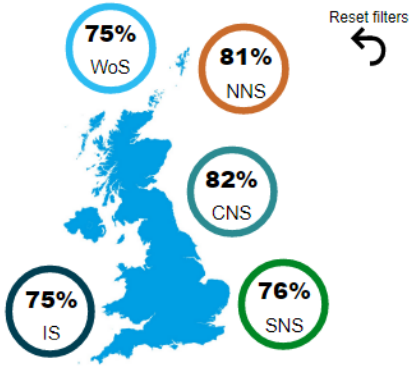
Select year and region to update the dashboard. Deselect the region to see UKCS figures. Click on reset filters to clear added filters.

2017 | 2018 | 2019

CNS | NNS & WoS | SNS & IS

2019 Production Efficiency Regional Split

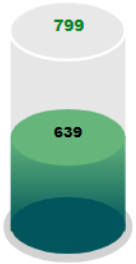
Reset filters



PE in the West of Shetlands (WoS) was maintained at 75%, while all other areas recorded increased production efficiencies. The Irish Sea (IS) continued the upward trend from 2018 and improved significantly by 27 percentage points to a PE of 75%. The second most improved area is the Central North Sea (CNS) with a rise by 5 percentage points, while the Northern North Sea (NNS) and Southern North Sea (SNS) areas both increased by 4 percentage points.

Production & Potential (mmboe)

EMPP AWP



80%

Production Efficiency

AWP Increase (mmboe)

7

EMPP Change (mmboe)

-40

of which:

COP'd EMPP (mmboe)

EMPP Decline (mmboe):

-26.0

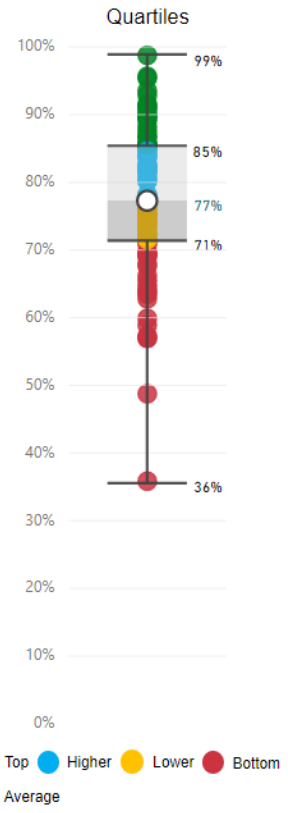
Production Efficiency by Hubs

Large Platforms 80%

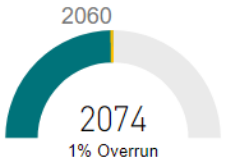
Small Manned Platforms 81%

Floating Hubs 77%

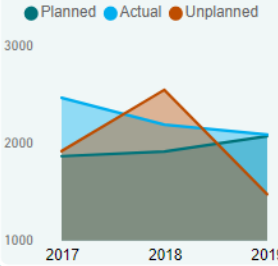
Unmanned Platforms 68%



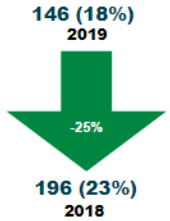
Actual vs Planned Shutdown (Days)



Planned & Unplanned Shutdown Duration (Days)



Total Production Losses, mmboe (% of Potential)



UKCS Production Efficiency – Area Trends

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At hub level, Production Efficiency increased for all infrastructure types with large platforms and small manned platforms achieving a PE of 80% and greater. Improved efficiency of unmanned hubs in the Southern North Sea area drove a significant 14 percentage point increase in PE for Unmanned platforms. The Production Efficiency distribution across hubs show shifts towards higher efficiencies. The bottom quartile range rose from 19% - 64%, to 36% - 71% and the average hub Production Efficiency increased by five percentage points to 77%.

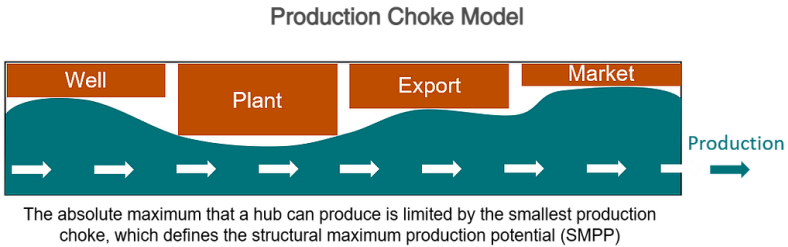
Production (AWP) in 2019 increased as a result of new fields, improved industry asset maintenance strategies and deployment of new technology. Conversely, total EMPP across the UKCS was negatively impacted by the natural decline of the basin and cessation of production on six hubs in 2019.

Hubs in the UKCS were shut down for a total of 2,074 days in 2019 only 14 days longer than planned, demonstrating an improvement in the estimation of shutdown duration. 1% overruns show a marked improvement from 15% overruns in the year before, while 120 Turnaround (TAR) days were deferred to subsequent years. The duration of unplanned shutdowns decreased by 42% from 2018.

Total losses to production dropped by 25% in 2019 with a corresponding decrease in percentage of potential lost from 23% in 2018 to 18% in 2019.

UKCS Production Losses

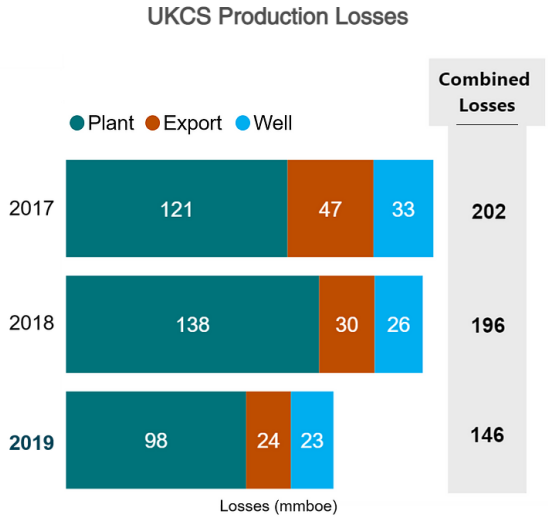
Oil & Gas Authority



The absolute maximum that a hub can produce is limited by the smallest production choke, which defines the structural maximum production potential (SMPP)

EMPP + UPP = SMPP

** UPP: Uneconomic Production Potential*



UKCS production losses are mainly categorised into Plant, Export, Well and Market Losses according to the production choke model in the SPE Production Efficiency best practice guidance. Due to the UKCS hydrocarbon sales arrangements, market losses are not considered as significant as plant, export and well losses, however, it is important to track them to ensure they do not present obstruction to sales or production.

An impressive 25% drop in UKCS combined production losses (plant, export, well and market losses), from 196 mmboe in 2018 to 146 mmboe in 2019, was largely driven by reduction in plant losses (-29%) and export losses (-20%). For plant losses, reductions in full plant and gathering system losses were key contributors, while decreases in planned and unplanned terminal outages as well as pipeline operator constraints (blending/backout) led to the decline in export losses.

UKCS Production Losses Trends

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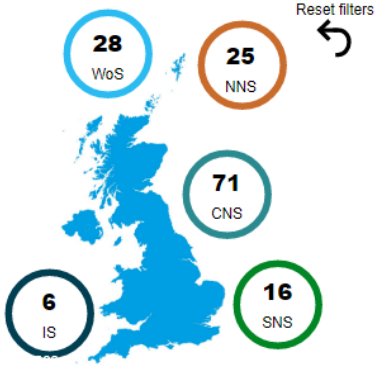
Select year and region to update the dashboard. Deselect the region to see UKCS figures. Click on reset filters to clear added filters.

2017 | 2018 | 2019

CNS | NNS & WoS | SNS & IS

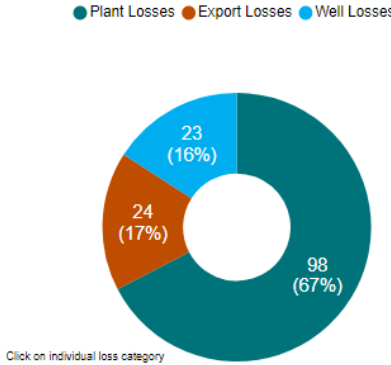
2019 Regional split - All Losses

Reset filters



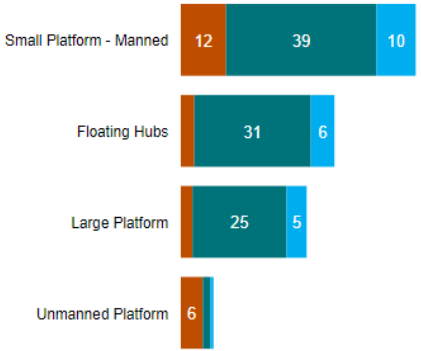
Plant, export and well losses all fell in 2019. Nine of eleven plant loss categories declined in 2019 contributing to a significant 29% decrease in plant losses and reversing the increase from 2017 to 2018. Improvements across main plant loss contributors: full plant, TAR and gas system loss categories were key to the large decrease with full plant losses declining by 69%, gas system losses by 32% and TAR losses by 24%. In contrast to 2018 where two loss categories showed a decrease in plant losses, small increases in plant losses only occurred in two categories – Injection system and Produced water system.

2019 UKCS Split of Loss Categories (mmboe, %)

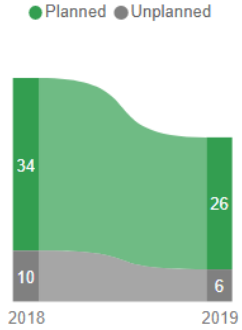


Click on individual loss category in pie chart to see split by loss types and infrastructure types

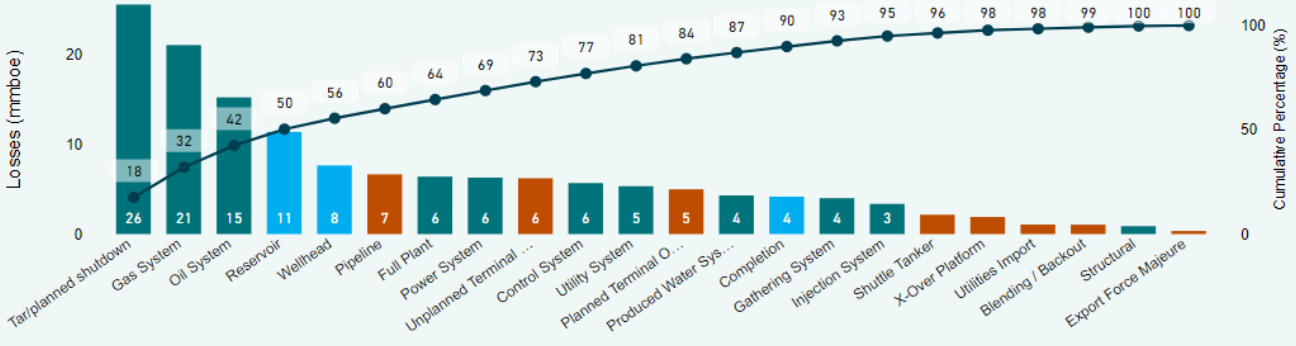
2019 UKCS Loss Category Split by Infrastructure Type (mmboe)



2018 & 2019 Losses to Shutdowns (mmboe)



2019 UKCS Loss Types (mmboe) & Cumulative Percentage (%)



UKCS Production Losses Trends

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Export losses reduced by 20% in 2019, driven by an average of 37% decreases in planned and unplanned terminal outage losses, and a 13% reduction in pipeline losses. Shuttle tanker, Cross-over, Export Force Majeure and Utilities Import losses all increased compared to 2018. These increased losses could be attributed to a long shutdown of a system common to a number of hubs.

Reservoir losses remain the dominant loss category for the well loss type. In 2019, well losses dropped by 12%. This was driven by combined decreases in reservoir losses (24%) and completion losses (22%). Continuing a three-year increase, wellhead losses increased by 15%.