

Re-use & decommissioning report

Decommissioning in practice

2019



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Cooperation, knowledge sharing and innovation

I am very proud to present to you Nexstep's second Re-use & decommissioning report. We publish this report annually and it provides insight into the expected oil and gas infrastructure that will be taken out of production in the Netherlands in 2019–2028.

An extensive infrastructure for the production and transportation of oil and gas has been built up in the Netherlands over the past decades. A large proportion of this infrastructure is approaching the end of its economic life. We are therefore facing a formidable task: the re-use or decommissioning of this infrastructure.

Nexstep coordinates, facilitates and accelerates the agenda for the re-use and decommissioning of oil and gas infrastructure in the Netherlands. The total cost of decommissioning wells and infrastructure was estimated in 2017 at 7 billion euro in 2017. Nexstep wants to reduce these costs by 30% by:

- **Sharing knowledge**

In 2018, we organised five shared learning workshops, which resulted in more than 150 learnings being identified and stored in a database developed specially for this purpose.

- **Cooperation between parties**

We are stimulating cooperation between operators, such as preparing a joint well decommissioning campaign. Furthermore, we encourage cooperation between the operators and the service industry to identify how to decommission offshore platforms in a smarter and more efficient manner.

- **Innovation**

We are looking into new developments in the decommissioning of wells and are investigating whether we can organise a pilot program in the Netherlands.

The main condition is that the decommissioning is carried out in a safe manner and environmental interests are safeguarded.

A limited proportion of the oil and gas infrastructure could be used to accelerate the energy transition. At the end of 2018, Nexstep launched a pilot project to determine the feasibility of offshore hydrogen production. Furthermore, we made an initial estimate of onshore wells that have the potential to be converted for geothermal energy. Additionally, we mapped out the offshore platforms that have the greatest CO₂ storage potential. The fact remains that re-use of offshore platforms will be limited. We estimate that approximately 10% of the platforms in the Dutch part of the North Sea are suitable for re-use. Most will be decommissioned and that is what we are working on. The subheading of this report is “Decommissioning in practice”. In a separate section, we will explain what decommissioning infrastructure involves, based on projects that were carried out last year.

This is the second time that we will indicate when infrastructure will be decommissioned according to current insights that are based on data from the operators. This year we have optimised the collection of data, which has resulted in a number of small changes compared to last year’s report. We will indicate these changes in the report, where necessary.

By collecting and analysing this data, we want to provide more insight into the extensive job we’re facing during the coming years. I would like to enter into a dialogue with you about this and therefore invite you to give your response to this report. Only by receiving this we can learn from one another and new possibilities for cooperation will arise.

I hope you enjoy reading this report.

Jacqueline Vaessen
General Manager Nexstep

1 Decommissioning & Re-use

This report outlines the status of in the decommissioning of the oil and gas infrastructure and the expectations for the next decade. The adjacent map gives an overview of onshore and offshore installations and wells in the Netherlands.

Nexstep expects ten platforms to be removed from the North Sea this year. The first platform was removed in January 2019 and another will be relocated to be re-used for the second time. Furthermore three subsea installations are foreseen to be removed from the seabed.

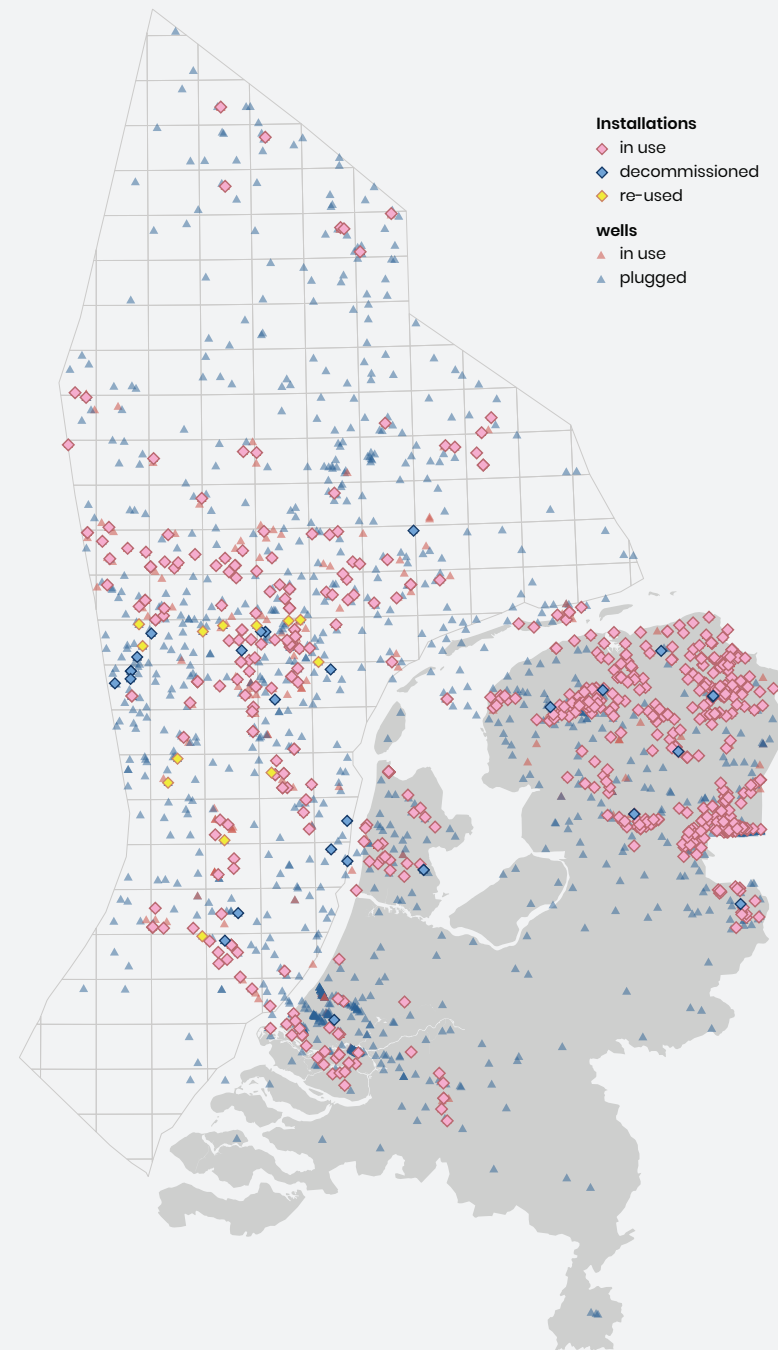


Figure 1.0.1
Overview of oil and gas infrastructure and wells in the Netherlands

Case Decommissioning and re-use of E18-A

In 1993 the satellite platform P14-A, located 50 kilometers off the coast of Scheveningen, started production. The platform produced around 3 billion cubic metres of gas until 2006.

In June 2008, the topsides were removed from the platform to be cleaned and prepared for re-use in Ridderkerk. The installation of the re-used topsides followed a year later, this time about 150 kilometers northwest of Den Helder. They were re-used on platform E18-A.

In the meantime E18-A has reached the end of its economic life. The topside has been re-used again and was transported to its new location in block D12 in June this year. This is a unique milestone, as it is the second time that a topside has been re-used in the Netherlands. After the platform was installed in D12, the ship sailed back to bring the jacket of E18-A on shore in Vlissingen to be processed for recycling.



2 Expected decommissioning in the Netherlands 2019–2028

Gas production in the Netherlands will continue to decrease in the years to come. Many oil and gas fields are nearing the end of their economic lives.

It is difficult to determine the exact date when the oil and gas infrastructure will reach the end of its life. This depends on many factors, including production volume, the gas price, new technology and operational costs. For this reason, the industry provides an estimated date for the infrastructure becoming available for decommissioning or re-use.

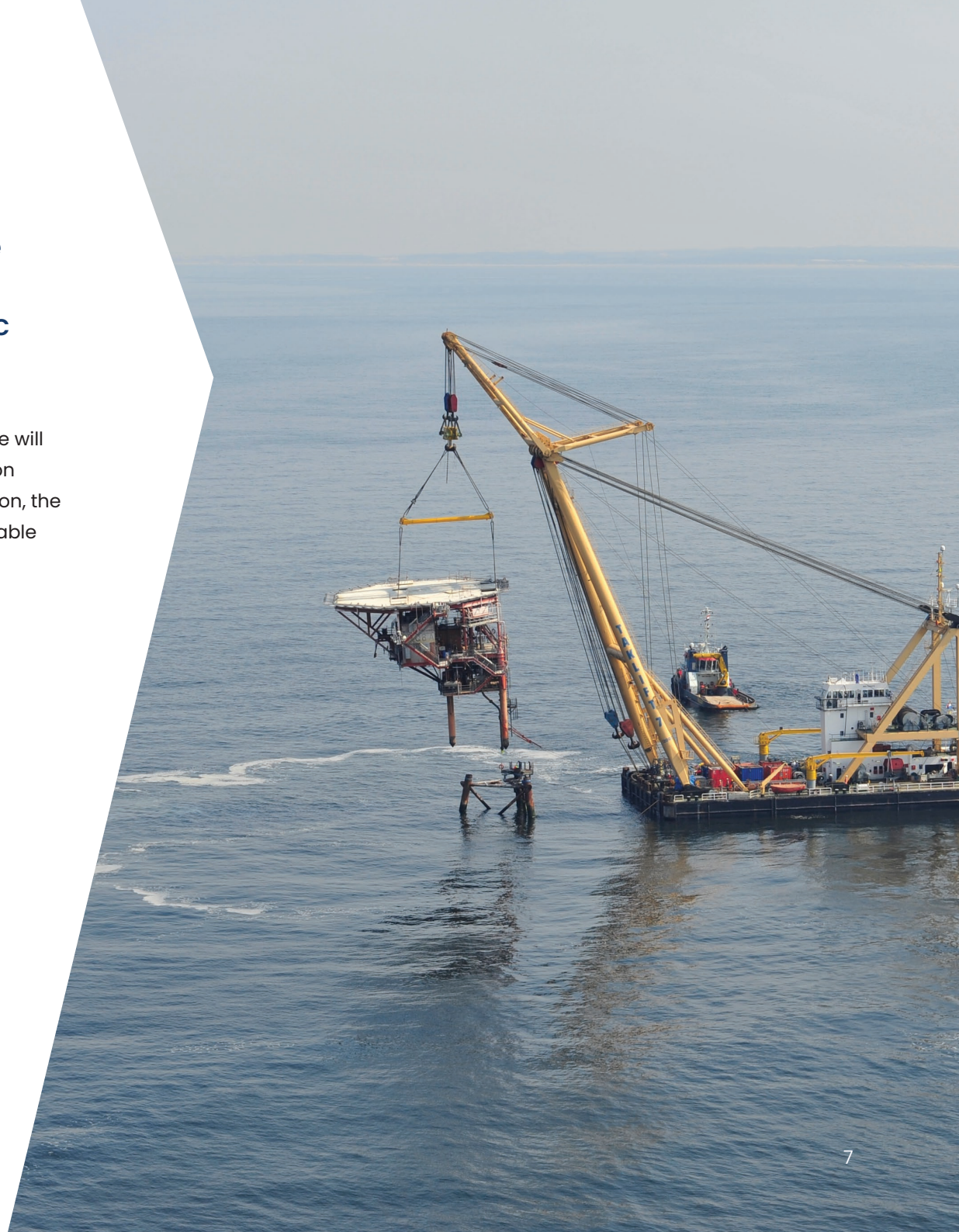
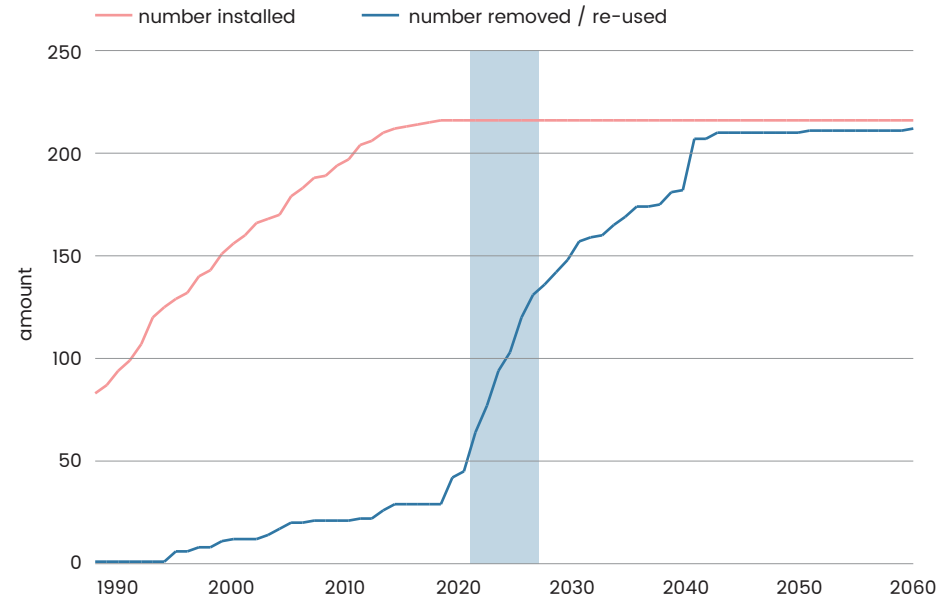


Figure 2.0.1. shows when infrastructure in the North Sea is expected to become available for re-use or decommissioning installations.

A large proportion of the installations will become available between 2021 and 2027. The acceleration between 2039 and 2040 is remarkable. A decommissioning campaign is foreseen for that period, which involves the decommissioning of several installations either simultaneously or successively in a short time.

Figure 2.0.1. The cumulative number of installed and removed offshore infrastructure items

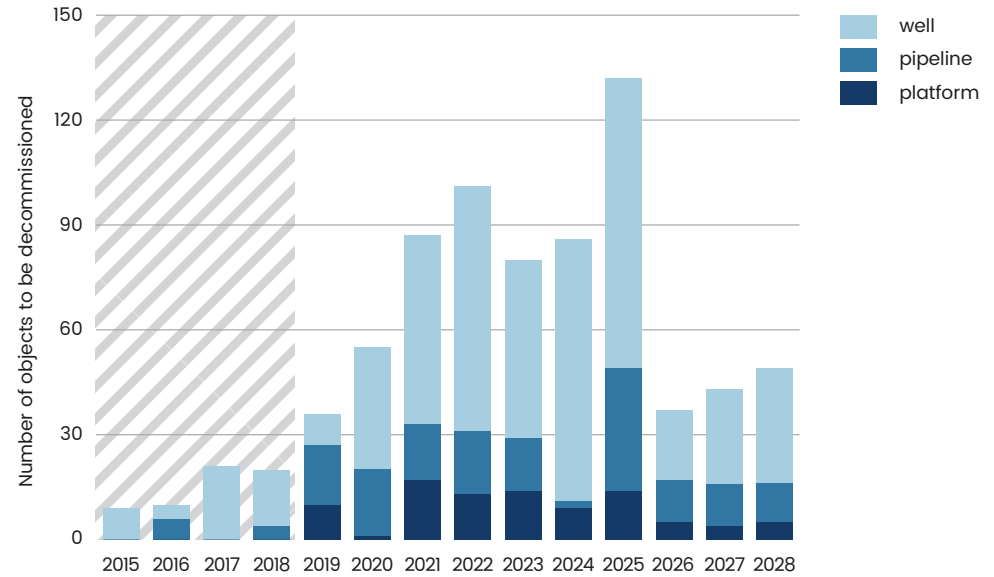


2.1 Total overview offshore & onshore

Figure 2.1.1. provides a comprehensive overview of offshore decommissioning. The figure is almost the same as last year. It is expected that approximately half of all the wells, platforms and pipelines will become available for decommissioning or re-use by 2028.

A peak can be seen in 2025, followed by a significant decrease in subsequent years. A portion of the activities can be expected to be postponed to 2026 or later.

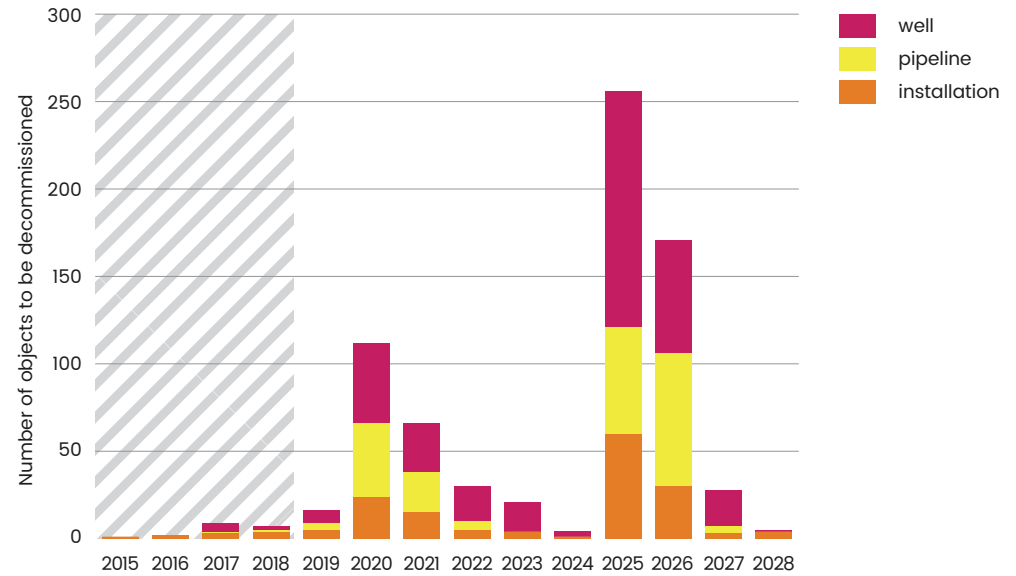
Figure 2.1.1. Offshore infrastructure that becomes available



Expectations with regard to onshore infrastructure becoming available are also almost identical to those of last year. There are annual peaks due to a number of foreseen removal campaigns.

Just like offshore, a peak can be seen in 2025, followed by a decrease in subsequent years. The expectation is that some of the plans will be postponed to 2026 or later.

Figure 2.1.2. Onshore infrastructure that becomes available



2.2 Offshore wells

The number of wells to be decommissioned is expected to increase significantly from 2020 onwards, with a peak in 2025. Compared to last year's report, there is some delay in the short term, followed by an acceleration until 2025.

Last year 16 offshore wells were decommissioned: three wells on main platforms, nine wells on satellite platforms, three subsea wells and one stand-alone well. It was expected that 17 wells would be decommissioned, including 14 wells on platforms and three subsea wells.

Nine wells are expected to be decommissioned this year, six on main platforms and three on satellite platforms. In the coming years most wells will be accessible from a platform. It is also expected that a large number of stand-alone wells that have been partly decommissioned will be permanently dismantled.

More information about the types of offshore wells can be found in the Re-use & decommissioning report: Glossary with icons, section 1.

Figure 2.2.1. Well type that becomes available

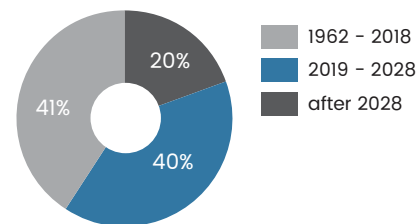
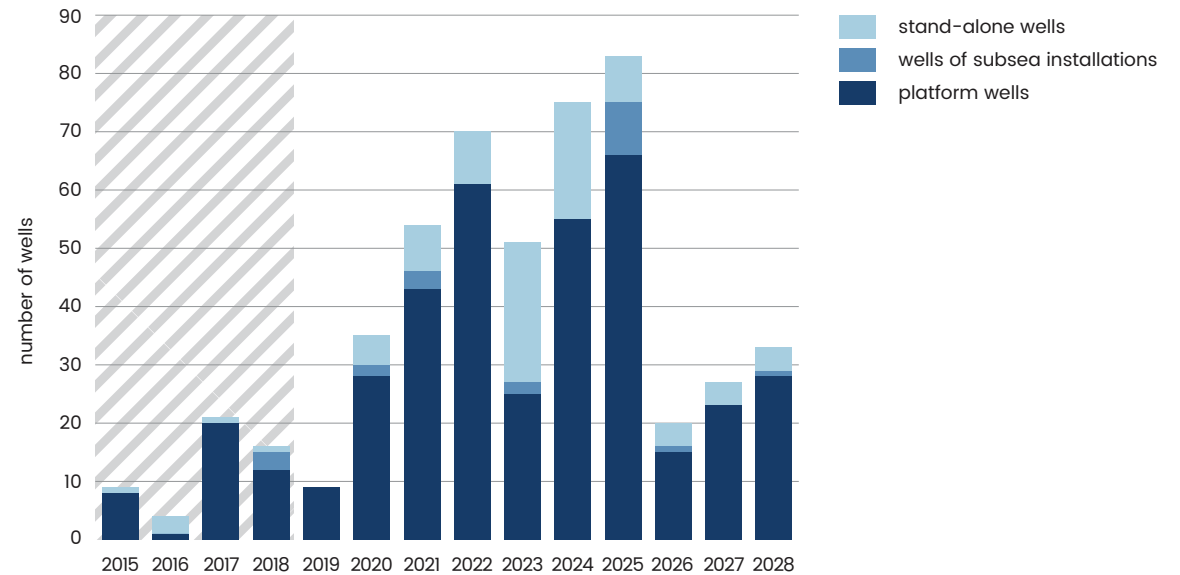


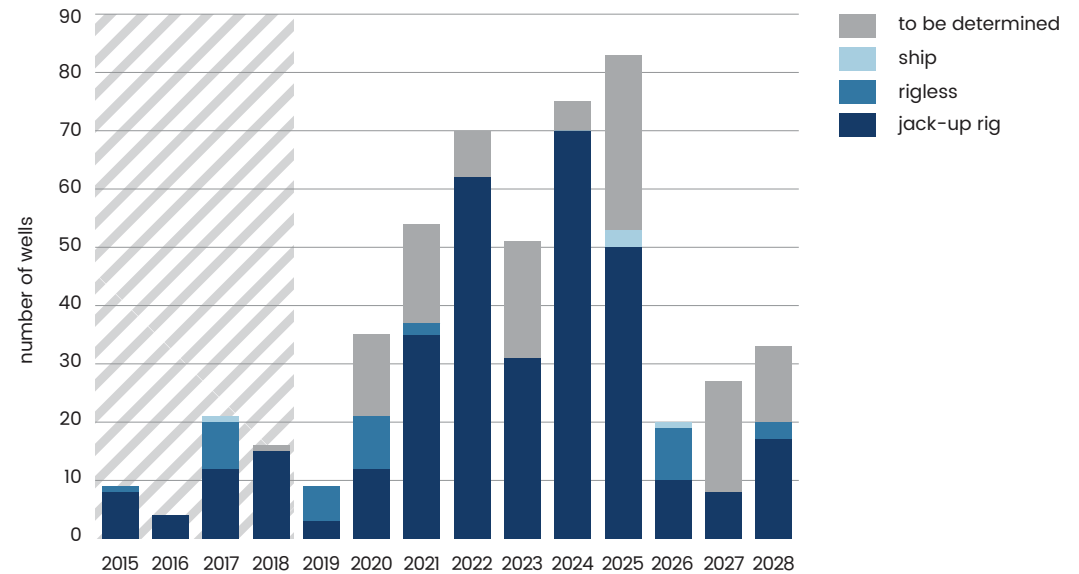
Figure 2.2.2. shows what method operators expect to use for decommissioning of the offshore wells. The method depends on the type of offshore platform.

Most wells are drilled from small satellite platforms where little space is available, therefore, a mobile jack-up drilling rig is generally required to decommission these wells. The method has not yet been determined for the decommissioning of a number of wells from 2020 onwards.

At Nexstep, several operators are working jointly on innovative methods for the decommissioning of wells. Steps have already been taken in this area in the past year and work on this is expected to continue in the coming year. Consequently, the methods mentioned here may be subject to change in the years ahead.

More information about decommissioning methods for offshore wells can be found in the Re-use & decommissioning report: Glossary with icons, section 1.1.

Figure 2.2.2. Expected method for decommissioning offshore wells



2.3 Offshore installations

Figure 2.3.1. shows the offshore installations that could be decommissioned or re-used.

Three satellite platforms and three subsea installations were expected to be decommissioned last year. The subsea wells were removed from the subsea installations in 2018, but the so-called protection domes still have to be removed from the seabed in 2019. Consequently, the subsea installations have not yet been completely decommissioned. Removal of the three satellite platforms has been postponed to 2019. Decommissioning was contracted to the service industry in 2018, for which a flexible contract term was agreed, which expires in 2019.

In 2019, five main platforms, five satellite platforms and three subsea installations will be removed. One satellite platform has already been removed in January 2019. Furthermore, the topside of platform E18-A was re-used for the second time (see case on the other side). The year 2019 is unique. Never before has such a large number of installations been decommissioned or re-used in a single year. More installations will be decommissioned this year than last year's forecasts for 2018 and 2019 together. This shows that the decommissioning of oil and gas infrastructure has become a reality.

More information about the types of offshore installations can be found in the Re-use & decommissioning report: Glossary with icons, section 2.

Figure 2.3.1. Offshore installations becoming available for decommissioning

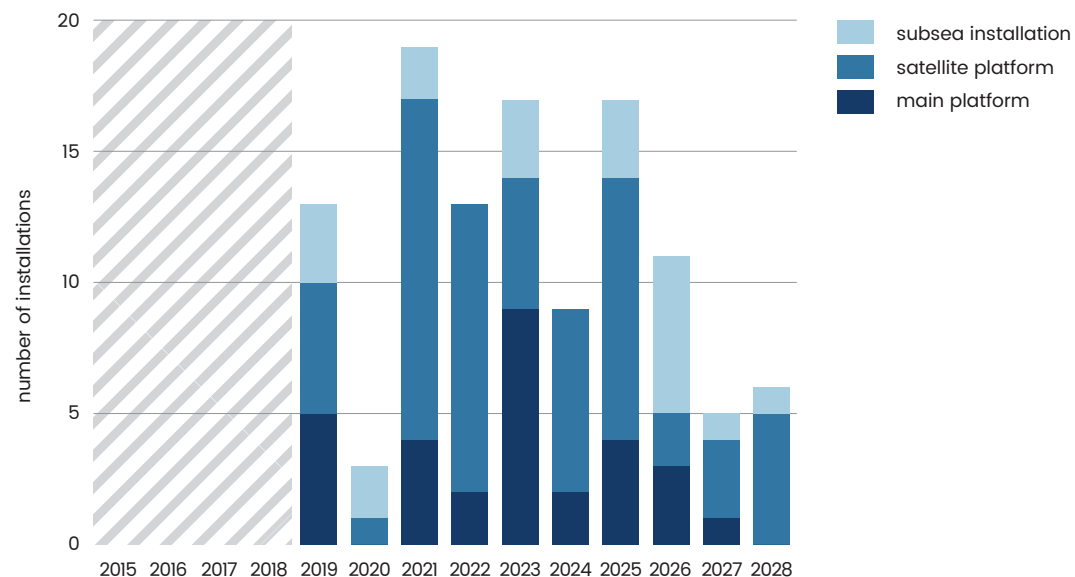


Figure 2.3.2. shows the expected weight per platform component. Compared to last year's report, the peak has moved from 2025 to 2026. Also 2027 has a significant peak. The peaks are due to the removal of the subsea foundations of two large platforms.

Figure 2.3.2. Expected weight per platform component

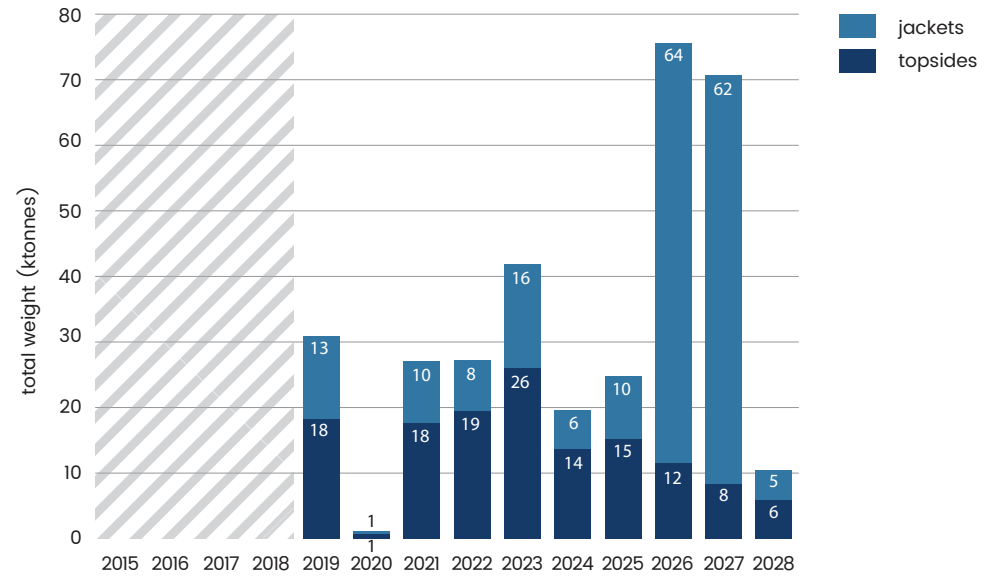
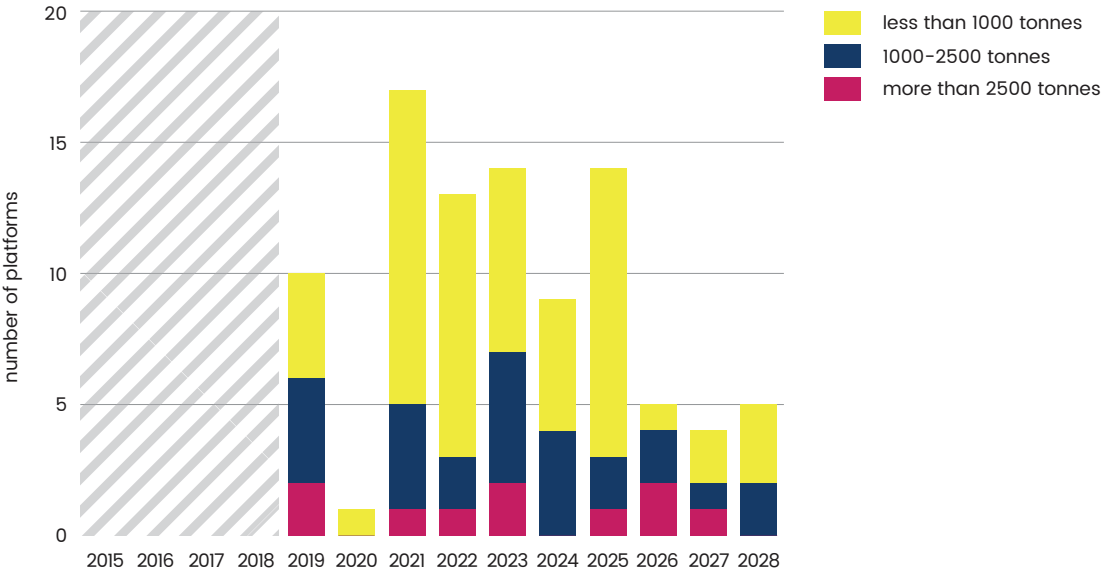


Figure 2.3.3. shows the number of platforms and their corresponding weight classes. The chart more or less corresponds to last year's report.

Figure 2.3.3. Expected decommissioning by weight module



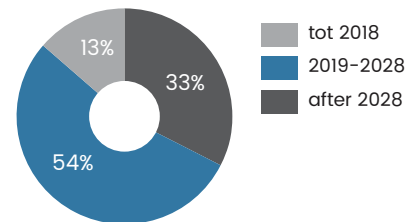
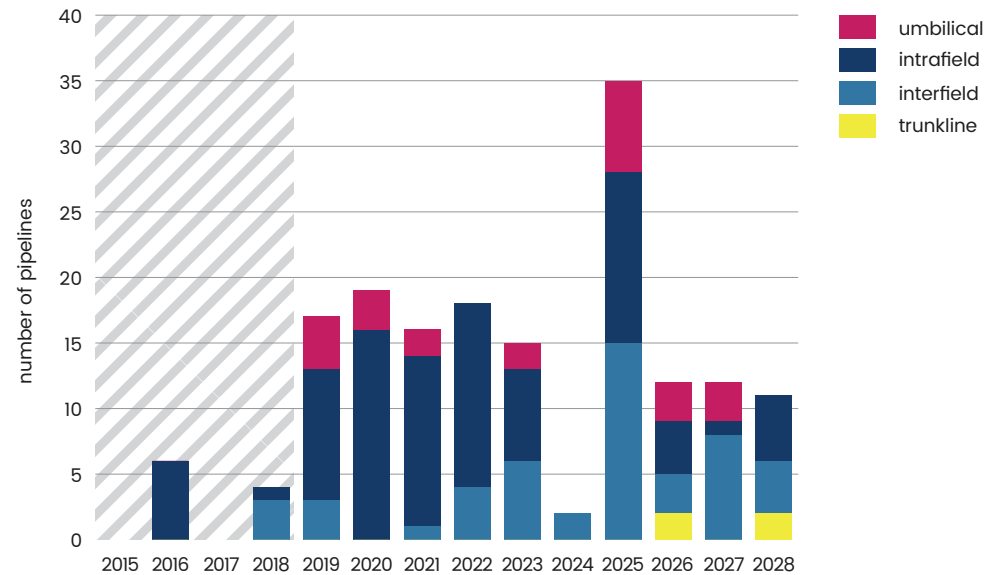
2.4 Offshore pipelines

Figure 2.4.1 shows the expected decommissioning by pipeline type. The offshore pipelines can be divided into interfield, intrafield, umbilical and trunk pipelines. The trunk pipelines will remain in operation until the last connected field ceases production.

Pipelines are often decommissioned prior to, or during, the removal of offshore installations. The timing of decommissioning therefore corresponds roughly to figure 2.3.1. Some of the work that is scheduled for 2025 is expected to take place a year earlier (2024) or later (2026).

More information about the types of pipelines can be found in the Re-use & decommissioning report: Glossary with icons, section 3.

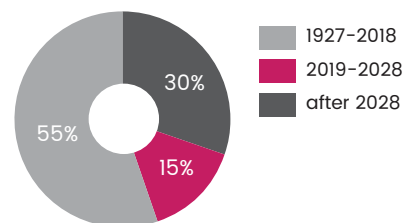
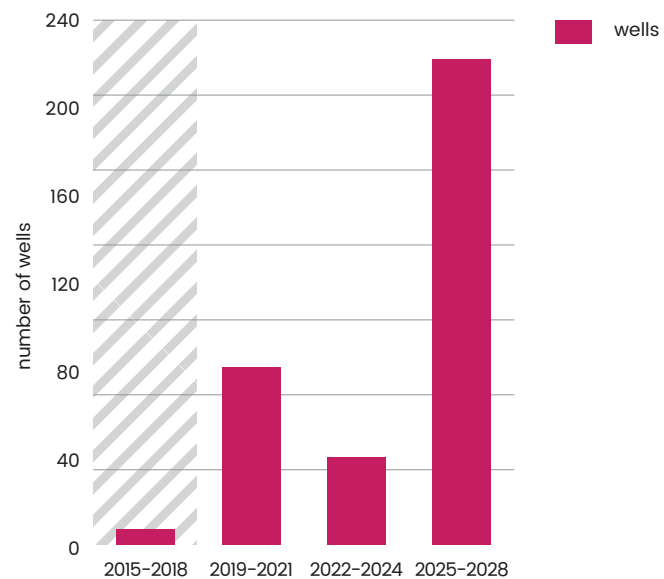
Figure 2.4.1. Expected decommissioning by pipeline type



2.5 Onshore wells

Chart 2.5.1 shows the expected decommissioning of onshore wells over the next decade. The figure more or less corresponds to last year's report.

Figure 2.5.1. Expected decommissioning of onshore wells

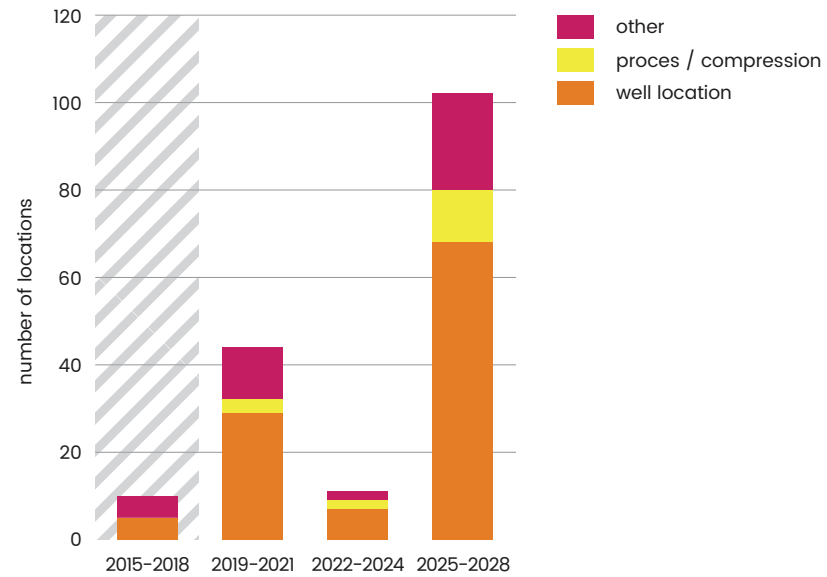


2.6 Onshore Locations

Figure 2.6.1. shows the expected decommissioning of onshore sites. The chart more or less corresponds to last year's report. About half of the onshore well locations will become available for decommissioning before 2028. Most onshore locations are expected to be decommissioned from 2025 onwards.

More information about the differences in used onshore installations in the Netherlands can be found in the Re-use & decommissioning report: Glossary with icons, section 4.

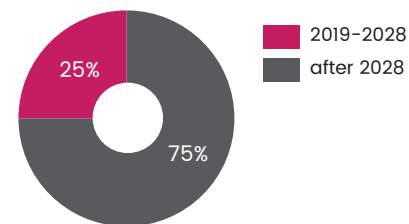
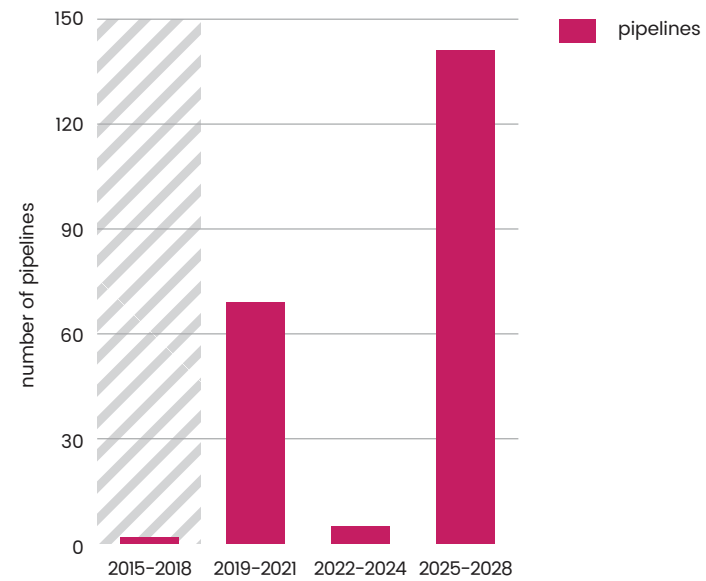
Figure 2.6.1. Expected decommissioning of onshore installations



2.7 Onshore pipelines

The timing of the decommissioning of pipelines is virtually unchanged and is the same as last year's report. Figure 2.7.1. shows that over the next ten years, 25% of onshore pipelines will become available for re-use or decommissioning.

Figure 2.7.1. Expected decommissioning of onshore pipelines



3 Expected decommissioning costs in the period 2019 – 2028

The total cost of decommissioning the oil and gas installations and wells was estimated in 2017 at 7 billion euro. The industry aims to reduce this amount by 30 percent. Nexstep has developed the “Road to 30%” strategy for this. The main condition is that the decommissioning is carried out in a safe manner and environmental interests are safeguarded.

Cooperation is needed to achieve this. Not just between the operators themselves, but also with the service industry, the government, and the regional and local authorities. Furthermore, a good estimate of the actual costs will be needed.

Since the formation of Nexstep, operators have shared their experiences and best practices by means of shared learnings. The aim of this is to raise the knowledge level of the sector. Furthermore, operators have started to coordinate their activities. This should lead to “joint decommissioning campaigns”.



Figure 3.0.1. shows that offshore wells, platforms and jackets are by far the most costly to decommission. Therefore it makes sense that this is where the greatest savings can be made.

Figure 3.0.1. Total decommissioning costs of offshore infrastructure subdivided by activities

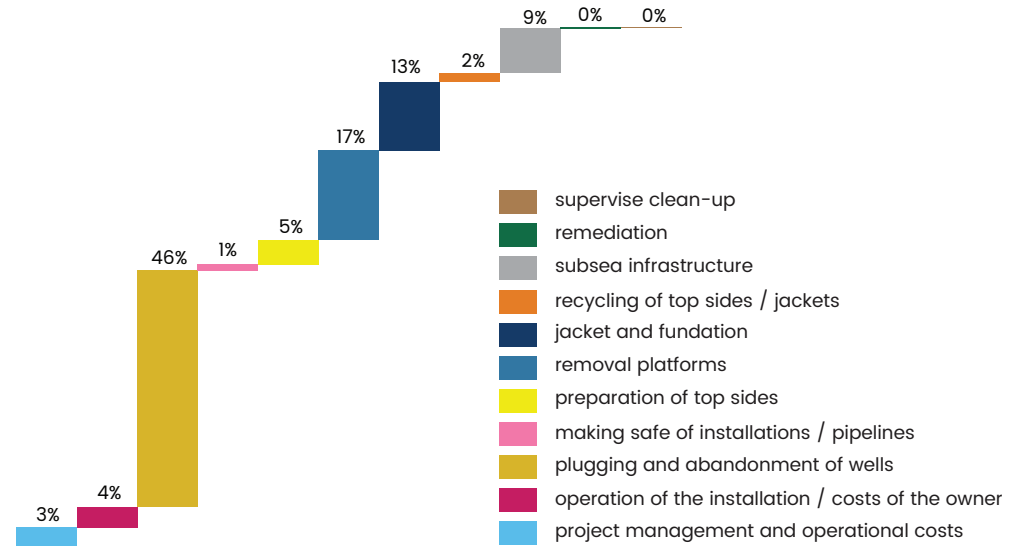


Figure 3.0.2. shows that the cost level is much more constant compared to last year's report. The total offshore decommissioning costs amount to 2.5 billion euro over the next ten years.

Figure 3.0.2. Annual expected costs of offshore decommissioning installations per category

