CARE TO SHARE A SEPARATOR?

Experiences from Gjøa production facilities

HYDROCARBON MANAGEMENT WORKSHOP 2022

- Neptune Energy – Who we are, what we do
- Gjøa production facilities
- Expansions and new fields
- Designing a new metering and allocation system
- Pros and cons

HYDROCARBON MANAGEMENT WORKSHOP 2022

Neptune Energy is an **independent energy company** with operations across Europe, North Africa and Asia Pacific.

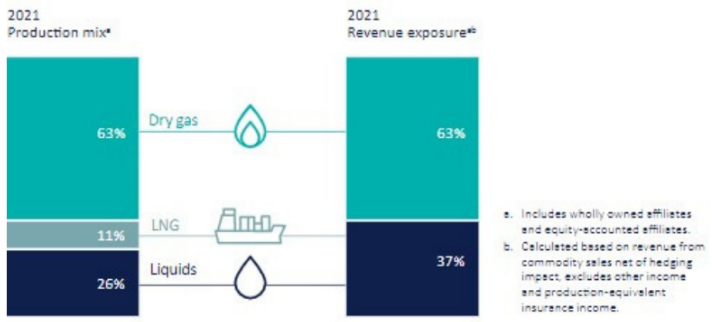
We aim to **store more carbon than is emitted** from our operations and the use of our sold products by 2030.

Production
130.0 kboepd

Reserves life
13 years

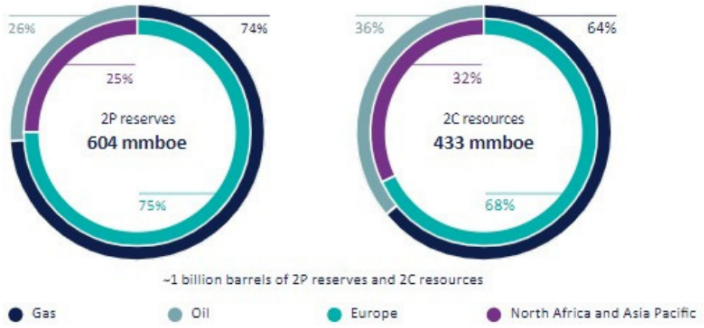
Operating cash flow*
$2.0 bn
*before working capital

Gas-weighted by volume, balanced by revenue



a. Includes wholly owned affiliates and equity-accounted affiliates.
b. Calculated based on revenue from commodity sales net of hedging impact, excludes other income and production-equivalent insurance income.

Long life, material growth potential



HYDROCARBON MANAGEMENT WORKSHOP 2022

NEPTUNE ENERGY

What we do

Explore
Focus exploration on shorter-term, material value-creating prospects, targeted around existing infrastructure

Develop
Develop fields at pace, preferably as operator, with innovative low cost solutions

Integrate
Integrate gas, oil, electrification, carbon capture and storage and hydrogen into energy systems

Produce
Produce fields safely and efficiently to maximise recovery, lower unit costs and reduce carbon intensity

Repurpose
Repurpose existing infrastructure to accelerate the energy transition

Designed for the energy transition

74% **Gas-weighted**
...of our production and 2P reserves is gas

Top 3% **ESG rating**
...of all global E&P companies rated by Sustainalytics

6.4kg CO_2/boe **Carbon intensity**
...almost 60% lower than the industry average

Norway

Neptune Energy has interests in seven producing fields in Norway from Snøhvit in the Barents Sea to Gudrun in the southern part of the North Sea. Approximately half of the Neptune Group's total production as well as 2P reserves are located Norway.

Since first oil in 2010, Neptune has operated the Gjøa oil and gas field. The semi-submersible production unit has full processing and export capabilities, and is powered by hydroelectricity generated, sustainably, from shore. As a result, the carbon intensity of Gjøa's production is among the lowest on the NCS.

Norway is a strategically important part of Neptune's global asset portfolio, with significant investment committed to project developments including Dugong, Duva, Fenja, Njord and Bauge.

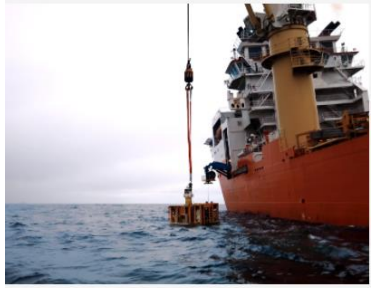
Daily average production	% of group production
45.7 kboepd	**35**

NEPTUNE ENERGY – ACTIVITY IN NORWAY

HYDROCARBON MANAGEMENT WORKSHOP 2022

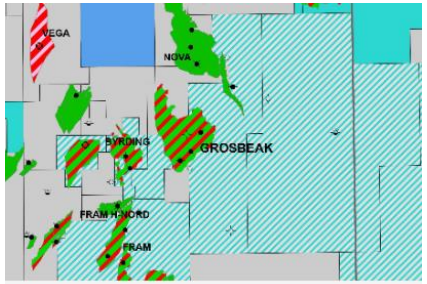
Gjøa

Gudrun

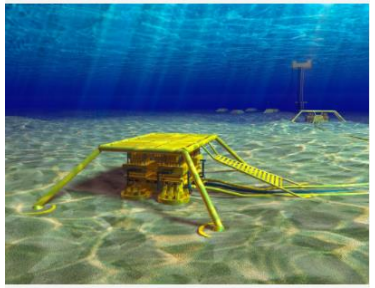


Duva

Nova



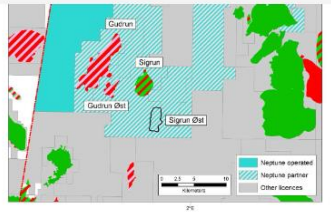
Grosbeak



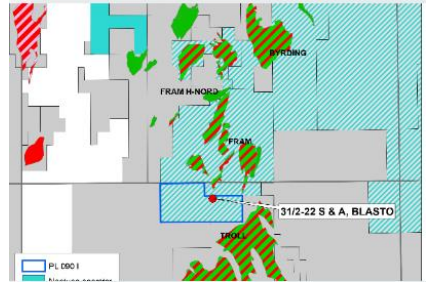
Fram area

Snøhvit

Gjøa P1

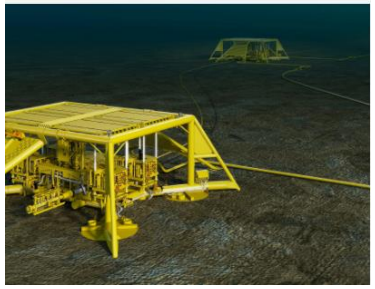


Sigrun & Sigrun East



Blasto

Njord area



Vega

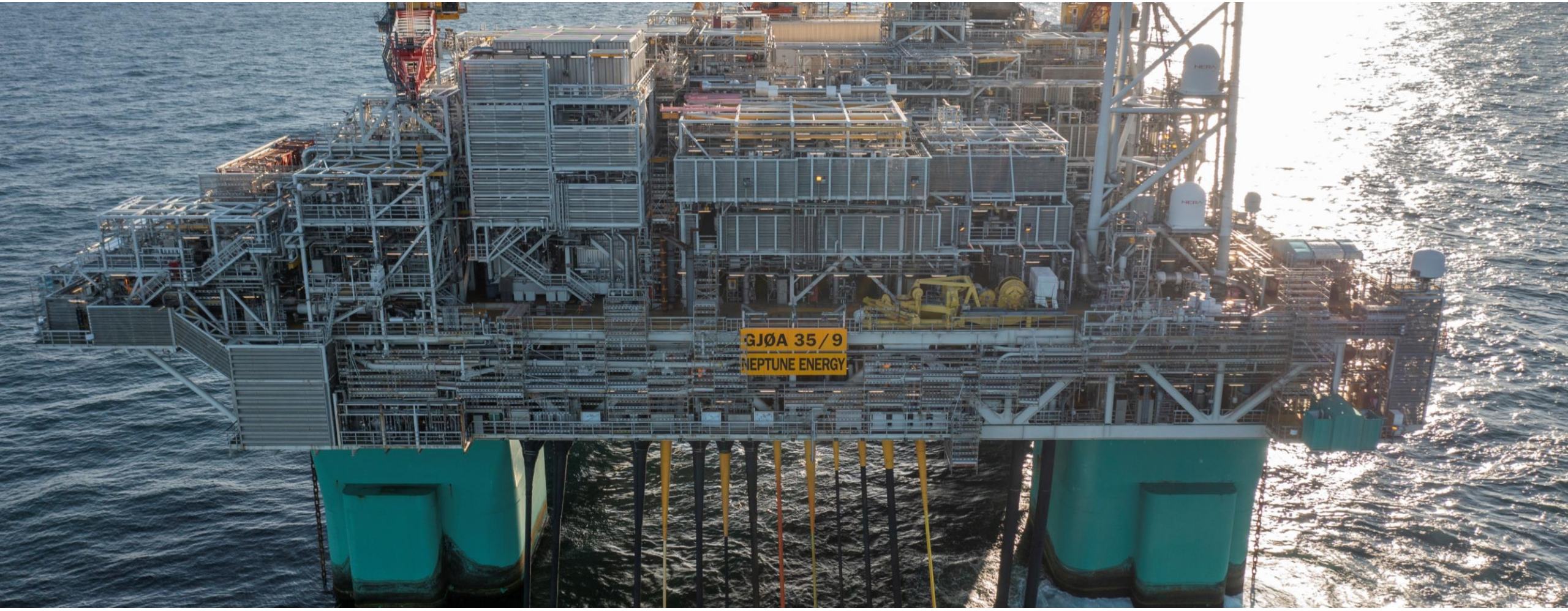
Fenja

Dugong

CARE TO SHARE A SEPARATOR? EXPERIENCES FROM GJØA PRODUCTION FACILITIES

HYDROCARBON MANAGEMENT WORKSHOP 2022

NEPTUNE ENERGY



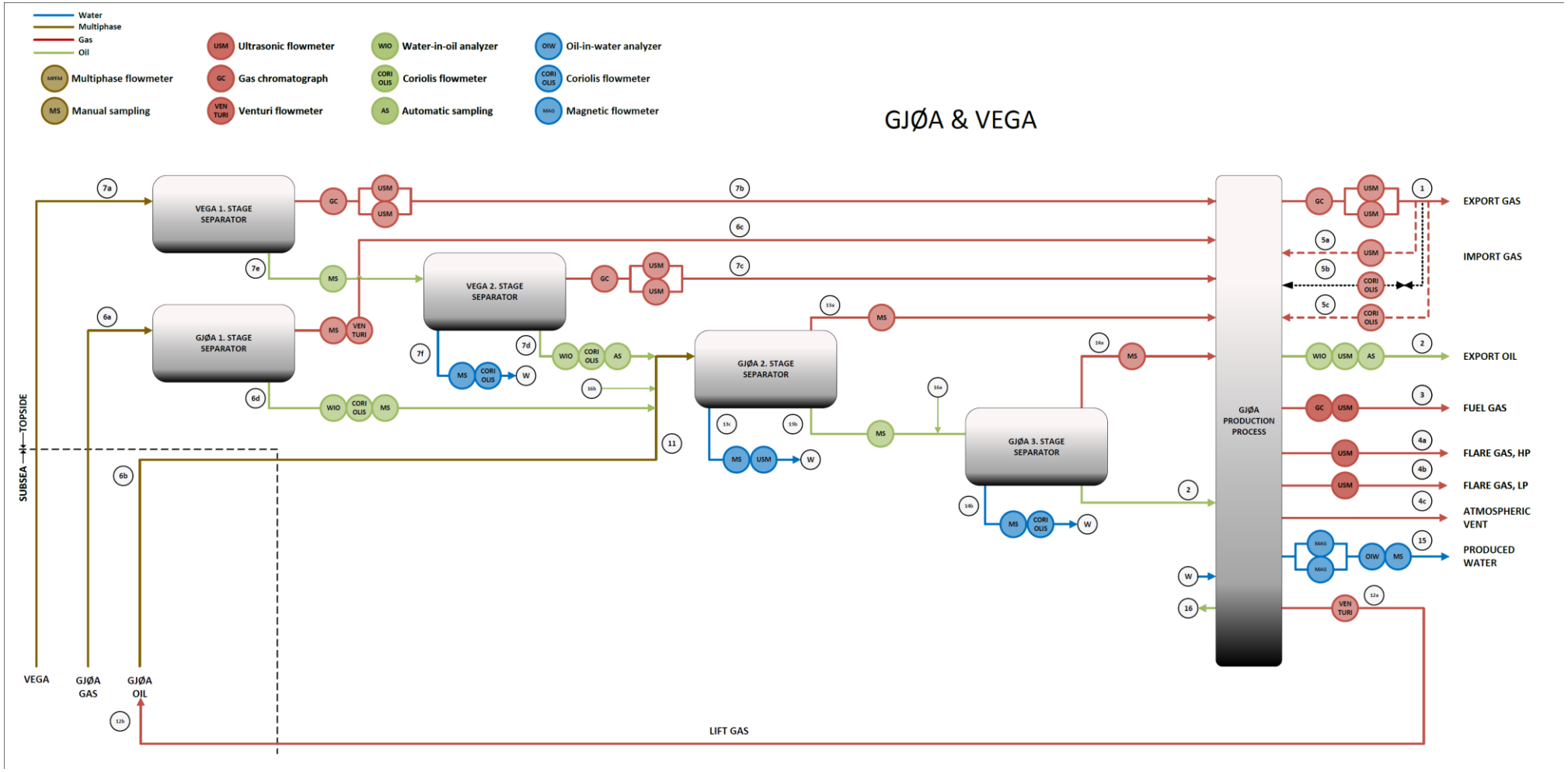
GJØA PRODUCTION FACILITIES – FACTS

HYDROCARBON MANAGEMENT WORKSHOP 2022

- Gjøa is predominantly a gas reservoir with reserves estimated at 58 mmboe per 1 January 2022. Gas accounts for over 90% of the reserves.
- The Gjøa field was discovered in 1989. Statoil was the development operator. The operatorship was transferred to Neptune when production commenced in 2010. Operational performance and production levels have been outstanding since the start of production and good reservoir management has extended the field life. Gjøa is now set to produce 100 mmboe more than was estimated when production started.
- The semi-submersible Gjøa production unit, which was jointly developed with nearby Vega fields, has full processing and export capabilities. The floating production facility has been designed to act as an area hub. It has a longer technical lifetime than the Gjøa/Vega fields and additional space and weight capacity.
- Oil is exported to the Mongstad crude oil terminal on the west coast of Norway. Gas is exported through the FLAGS pipeline to the St. Fergus Gas Terminal in Scotland.
- Gjøa is the first floating production platform to be powered sustainably by onshore facilities. A 100 km submarine cable delivers hydropower-generated electricity from Mongstad.

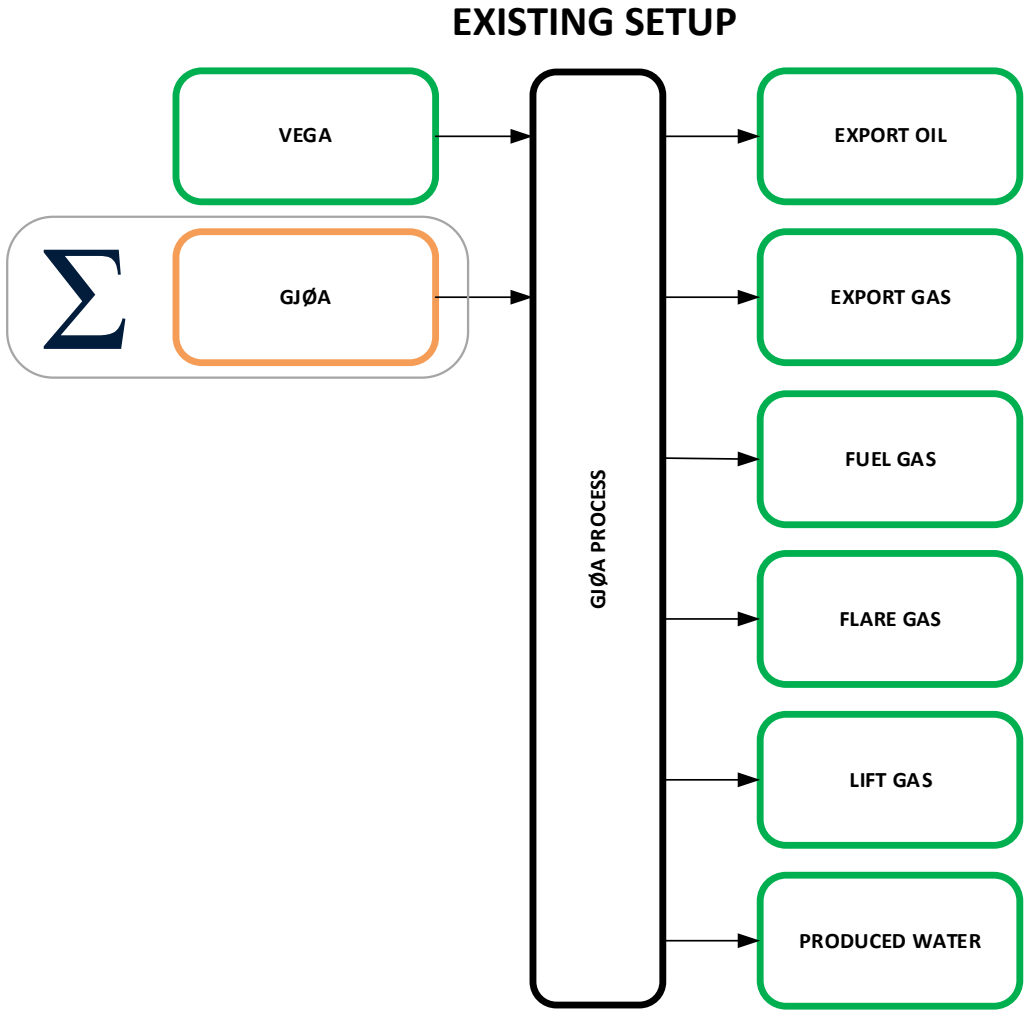
GJØA FACILITY – KEY METERING AND SAMPLING POINTS – PRE DUVA/NOVA STARTUP

HYDROCARBON MANAGEMENT WORKSHOP 2022



Key elements of the allocation concept:

- Component mass allocation, C1-C6+, including N2 and CO2.
- Vega field is allocated as-measured, corrected with component oil recovery factors.
- Monthly simulated oil recovery factors, CORF.
- Fuel & flare gas allocation.
- Crude oil value adjustment.
- Two allocation networks:
  - 00:00 and 07:00



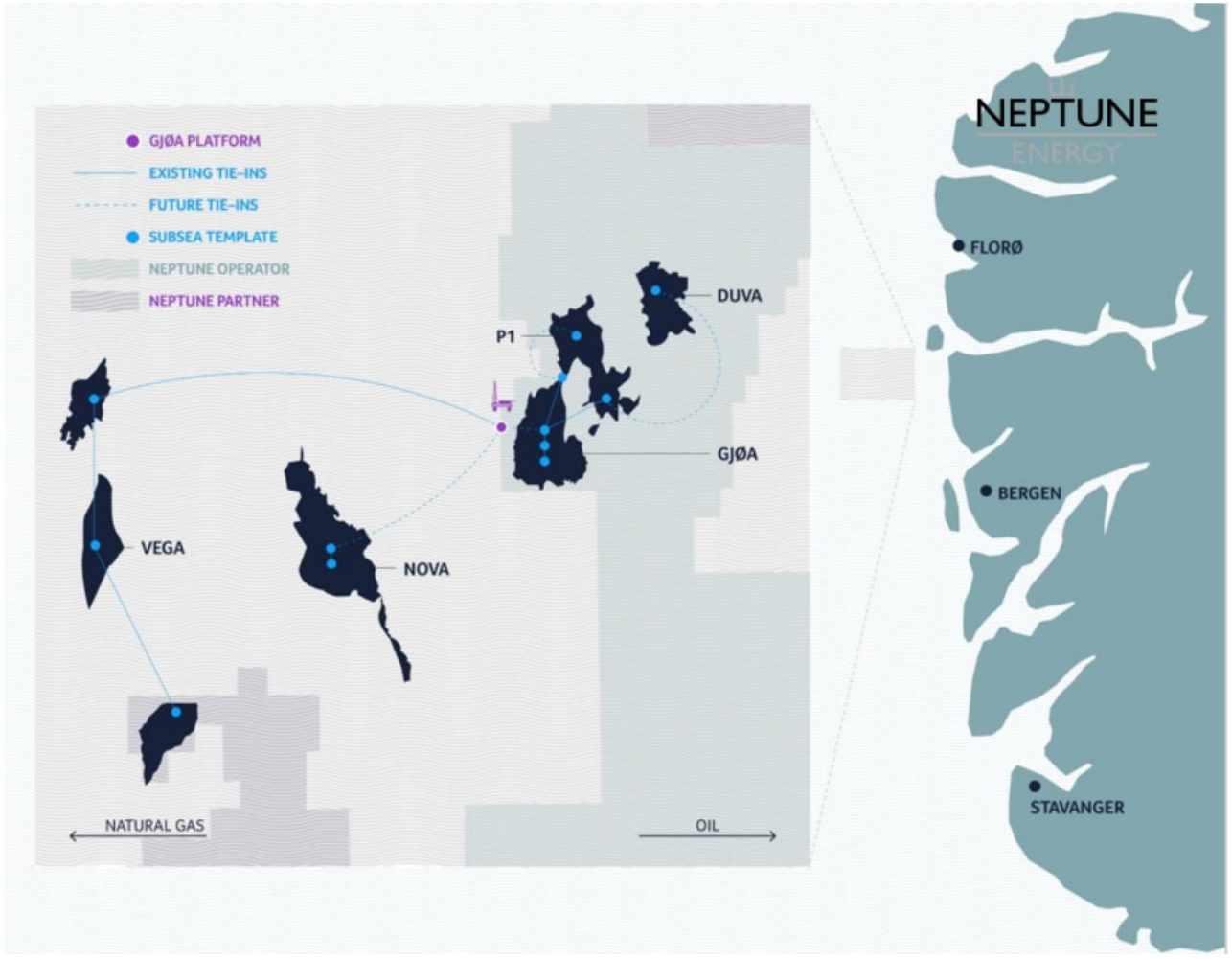
GJØA PRODUCTION FACILITIES – EXPANSIONS AND NEW TIE-INS

HYDROCARBON MANAGEMENT WORKSHOP 2022

- To mitigate the decline of Gjøa's own production, the commitment was made to develop three projects which make use of its processing capacity.
- Two of these have now been delivered with the first of those, the Gjøa P1 development, representing an extension of an existing reservoir in the northern part of the field. The P1 segment came into production in February 2021, increasing the total remaining developed reserves at Gjøa by 30%.
- In addition, the Neptune-operated Duva discovery 14 km northeast of Gjøa, was brought online as a four-well subsea tieback in August 2021.
- Start-up of three new wells from the Vega field in the period Q4 2021 – Q2 2022, utilizing existing subsea infrastructure
- The WintershallDea-operated Nova field is also planned to be produced using Gjøa facilities and is scheduled to start production in Q3 2022.

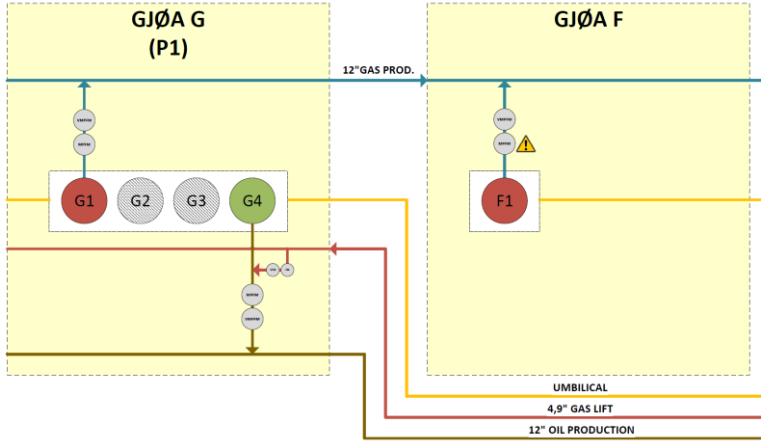
GJØA PRODUCTION FACILITIES – EXPANSIONS AND NEW TIE-INS

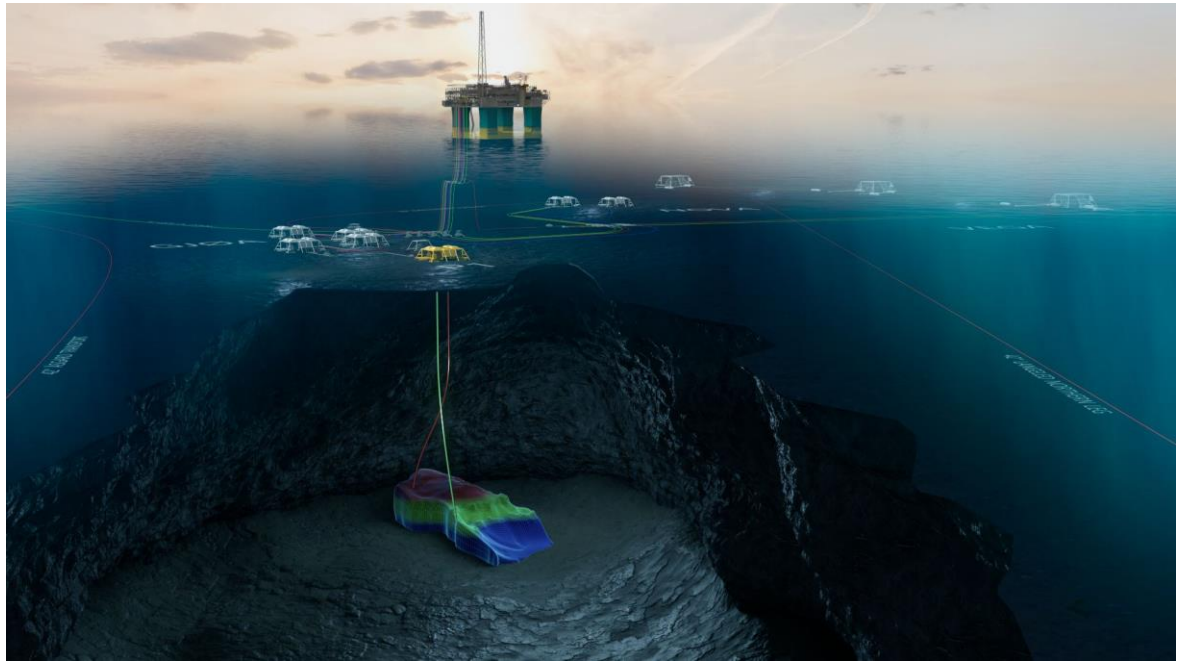
HYDROCARBON MANAGEMENT WORKSHOP 2022



GJØA P1 REDEVELOPMENT

- New 4-slot production template
- 1x gas producer (G1)
- 1x oil producer, including lift gas (G4)
- Dual flowlines with flexible well routing (gas line / oil line)
- Dedicated inlet separator for the gas line
- Multiphase flowmeters (MPFM and VFM)

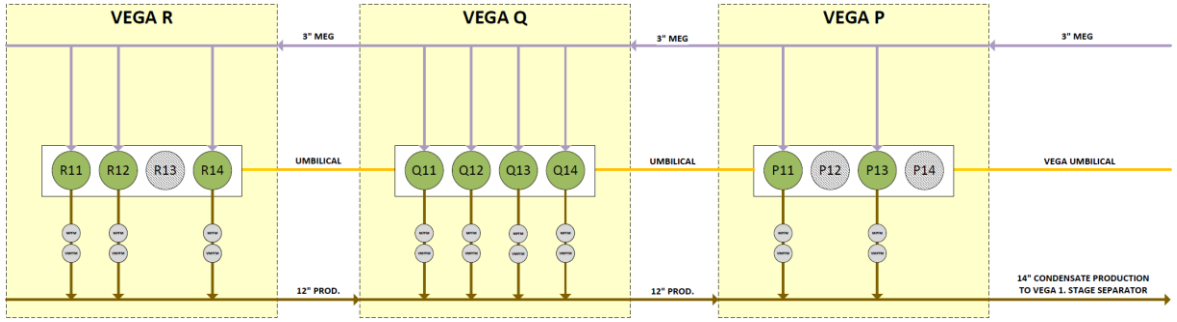


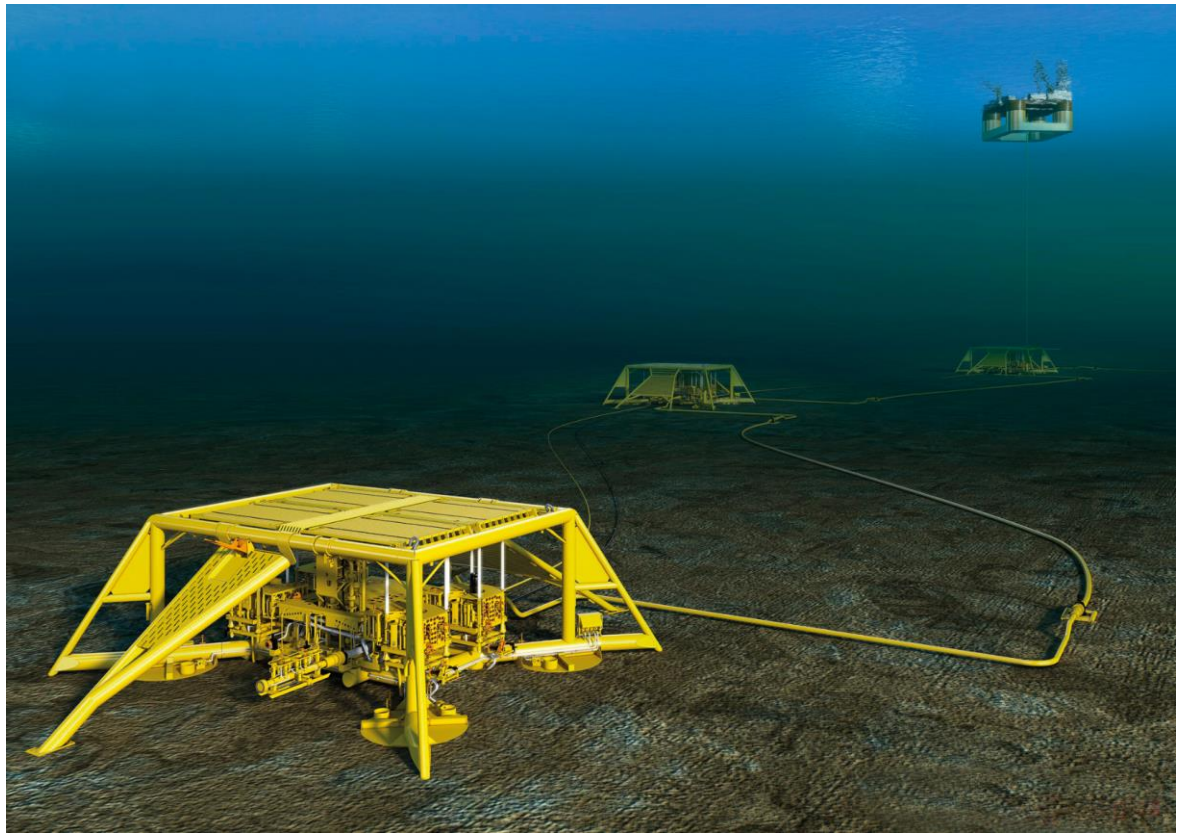


NEPTUNE ENERGY

VEGA EXPANSION

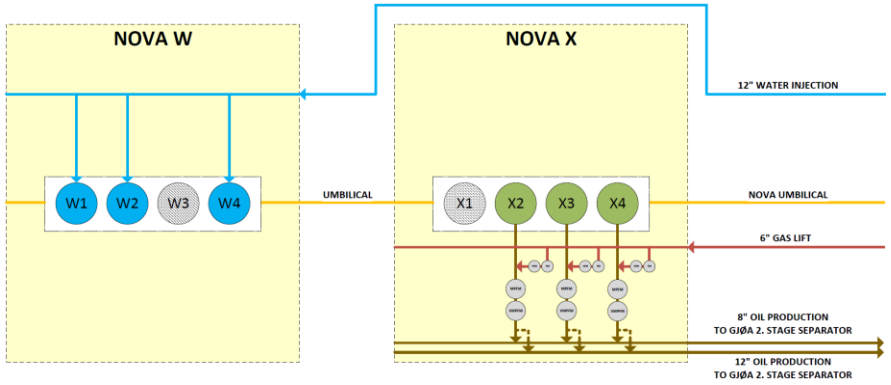
- New infill wells utilizing existing templates
- 3x condensate producers (Q11, Q13, R11)
- No lift gas arrangement
- Single flowline
- Dedicated two-stage inlet separators
- Multiphase flowmeters (MPFM and VFM)

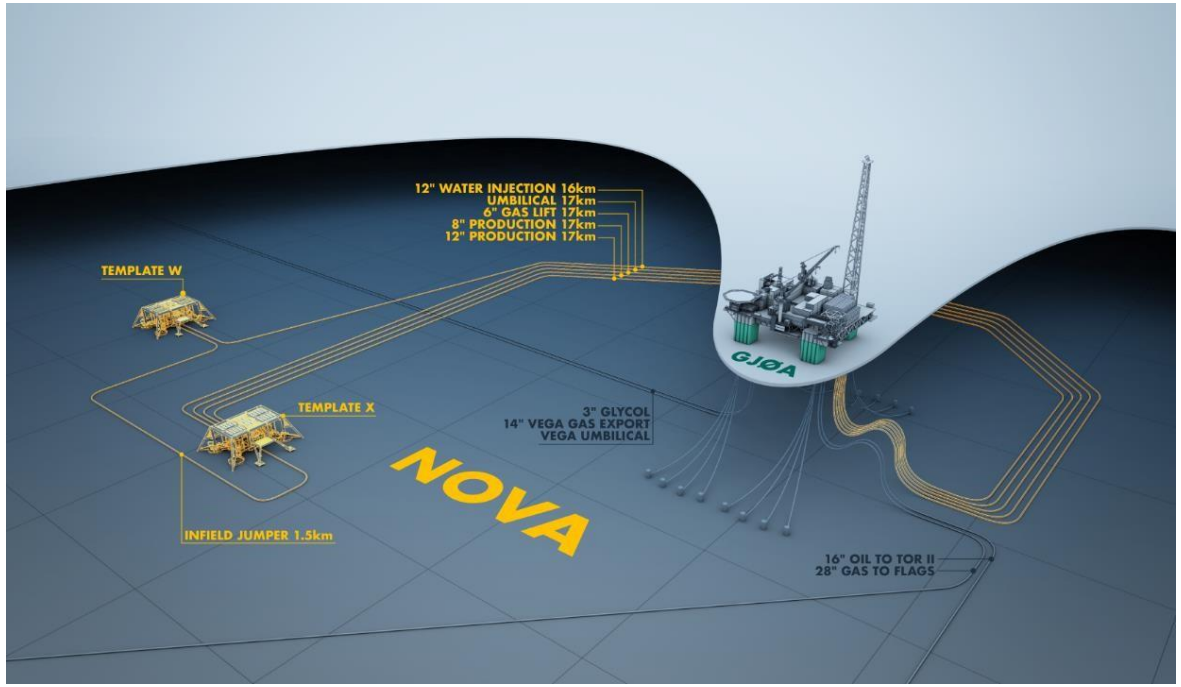




NOVA TIE-IN

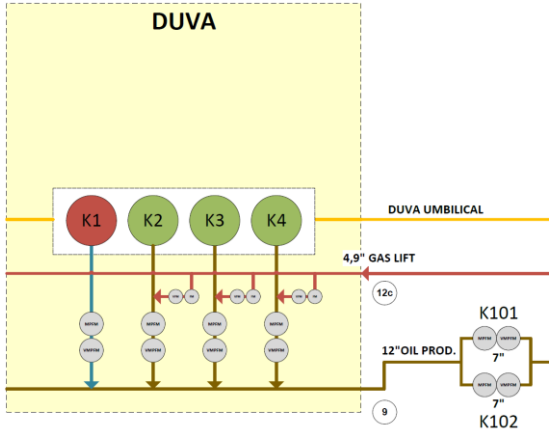
- New 4-slot production template (“X-template”)
- New 4-slot water injection template (“W-template”)
- 3x oil producers, including lift gas (X2, X3, X4)
- 3x water injectors (W1, W2, W4)
- Dual flowlines with flexible well routing (8”/ 12”)
- Shared inlet separator
- Multiphase flowmeters (MPFM and VFM)

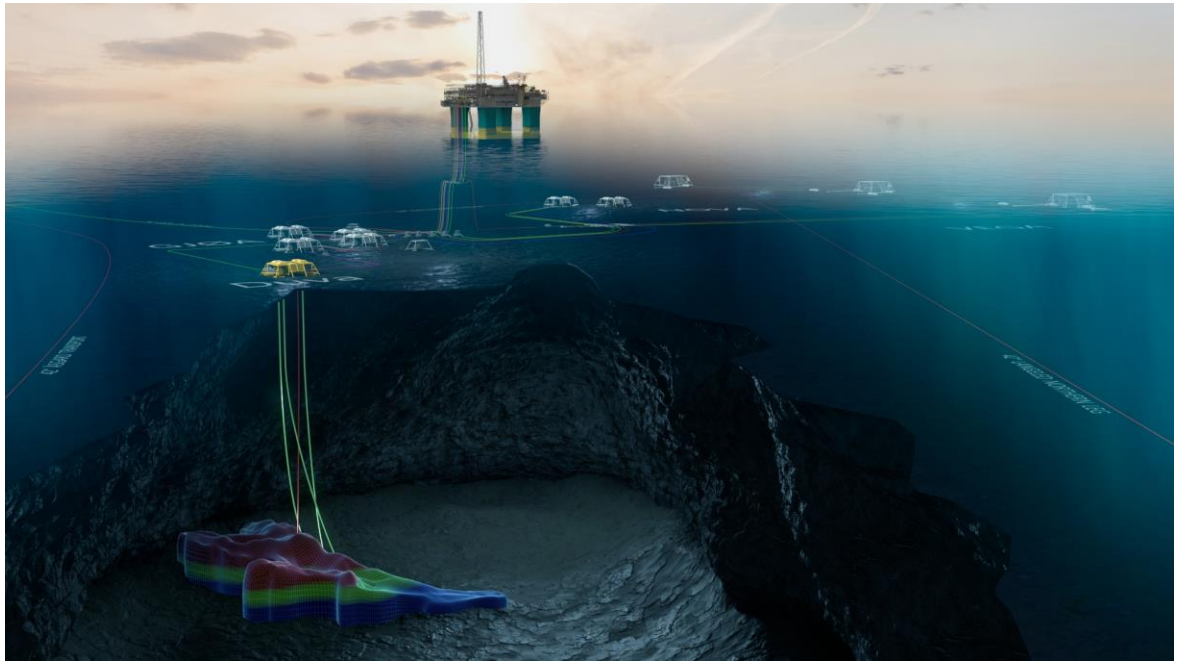




DUVA TIE-IN

- New 4-slot production template (“K-template”)
- 1x gas producer (K1)
- 3x oil producers, including lift gas (K2, K3, K4)
- Single flowline
- Shared inlet separator
- Multiphase flowmeters (MPFM and VFM)





LICENCE PARTNERSHIPS – GJØA WITH TIE-INS

HYDROCARBON MANAGEMENT WORKSHOP 2022

NEPTUNE ENERGY

GJØA:

Company name	Nation code	Company share [%]
Petoro AS	NO	30.000000
Neptune Energy Norge AS	NO	30.000000
Wintershall Dea Norge AS	NO	28.000000
OKEA ASA	NO	12.000000

DUVA:

Company name	Nation code	Company share [%]
INPEX Idemitsu Norge AS	NO	30.000000
PGNiG Upstream Norway AS	NO	30.000000
Neptune Energy Norge AS	NO	30.000000
Sval Energi AS	NO	10.000000

VEGA:

Company name	Nation code	Company share [%]
Wintershall Dea Norge AS	NO	56.700000
Petoro AS	NO	31.200000
Spirit Energy Norway AS	NO	5.500000
Neptune Energy Norge AS	NO	3.300000
INPEX Idemitsu Norge AS	NO	3.300000

NOVA:

Company name	Nation code	Company share [%]
Wintershall Dea Norge AS	NO	45.000000
Sval Energi AS	NO	25.000000
Spirit Energy Norway AS	NO	20.000000
ONE-Dyas Norge AS	NO	10.000000

Reference: NPD Fact pages as of 26.05.2022

NEPTUNE ENERGY

The task of maximizing value for stakeholders without compromising safety introduces a delicate balancing act between conflicting interests:

- Cost
- Production
- Uncertainty

How to accommodate the tie-ins?

How to find the sweet spot?

Mr. Metering

Mr. Cost

Ms. Production

Mr. Manager

Mr. Metering | Mr. Cost | Ms. Production | Mr. Manager

Mr. Metering | Mr. Cost | Ms. Production | Mr. Manager

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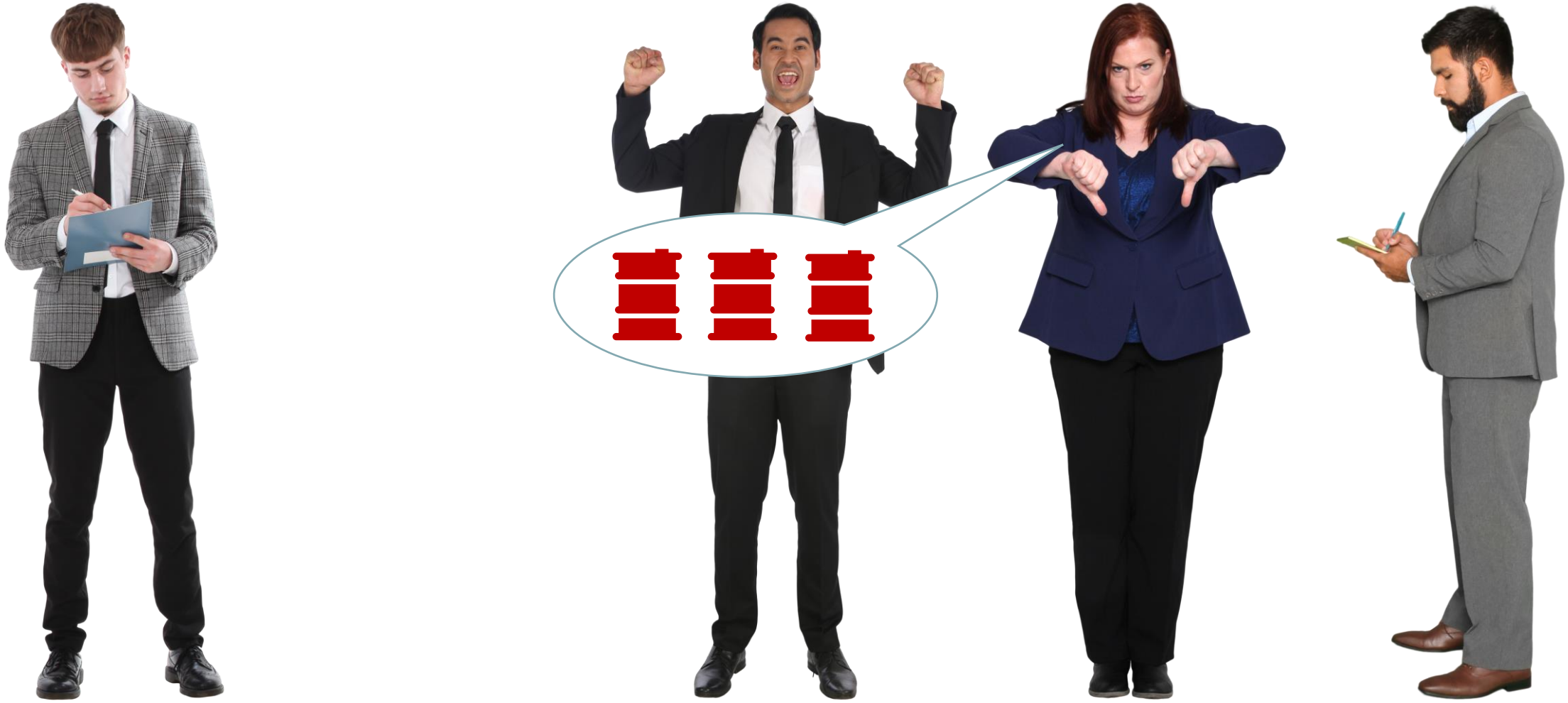


Mr. Metering

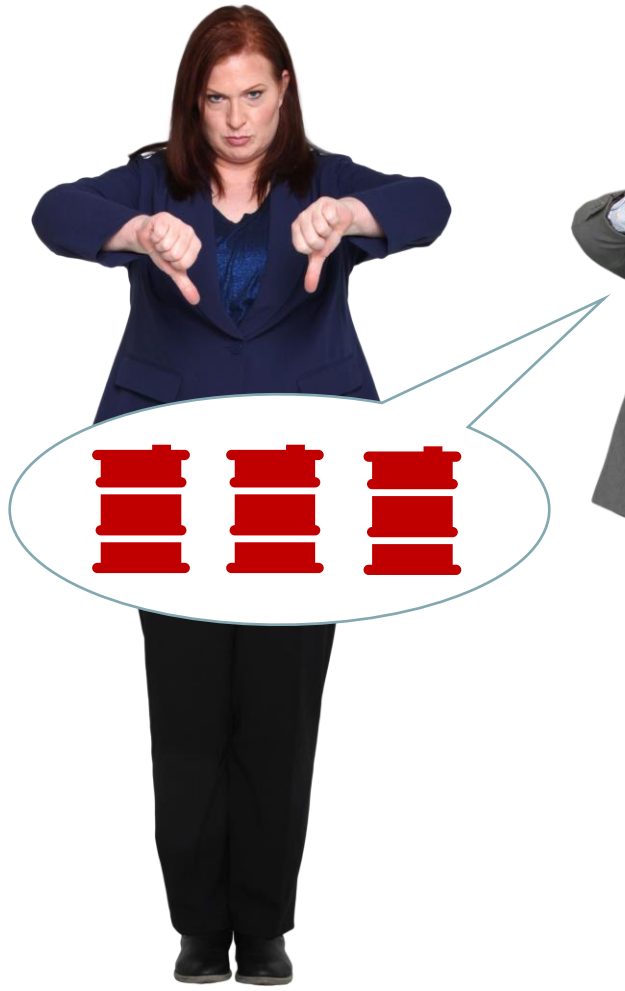
Mr. Cost

Ms. Production

Mr. Manager

Mr. Metering

Mr. Cost



Ms. Production

Mr. Manager

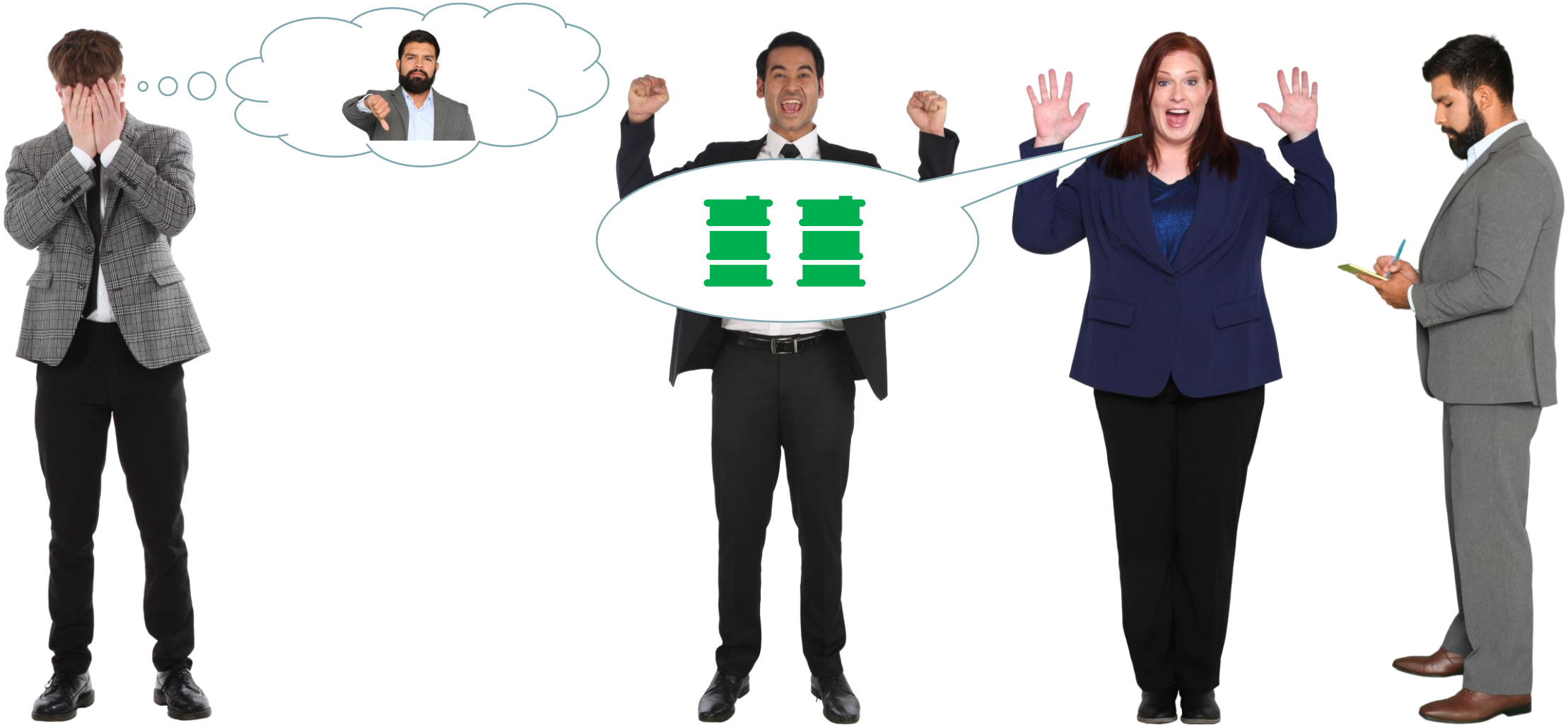
Mr. Metering | Mr. Cost | Ms. Production | Mr. Manager

Mr. Metering

Mr. Cost

Ms. Production

Mr. Manager



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Mr. Cost

Ms. Production

Mr. Manager

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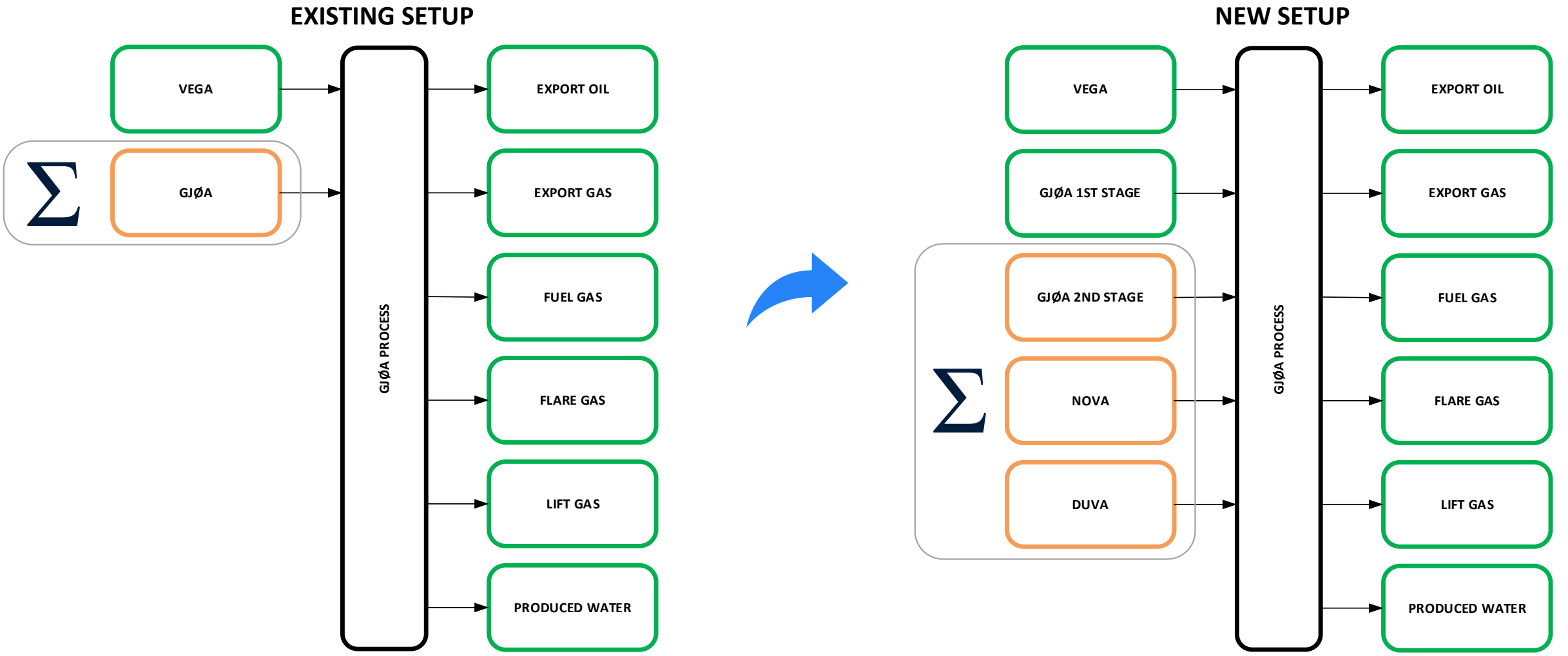
NOVA AND DUVA TIE-IN TO GJØA

HYDROCARBON MANAGEMENT WORKSHOP 2022

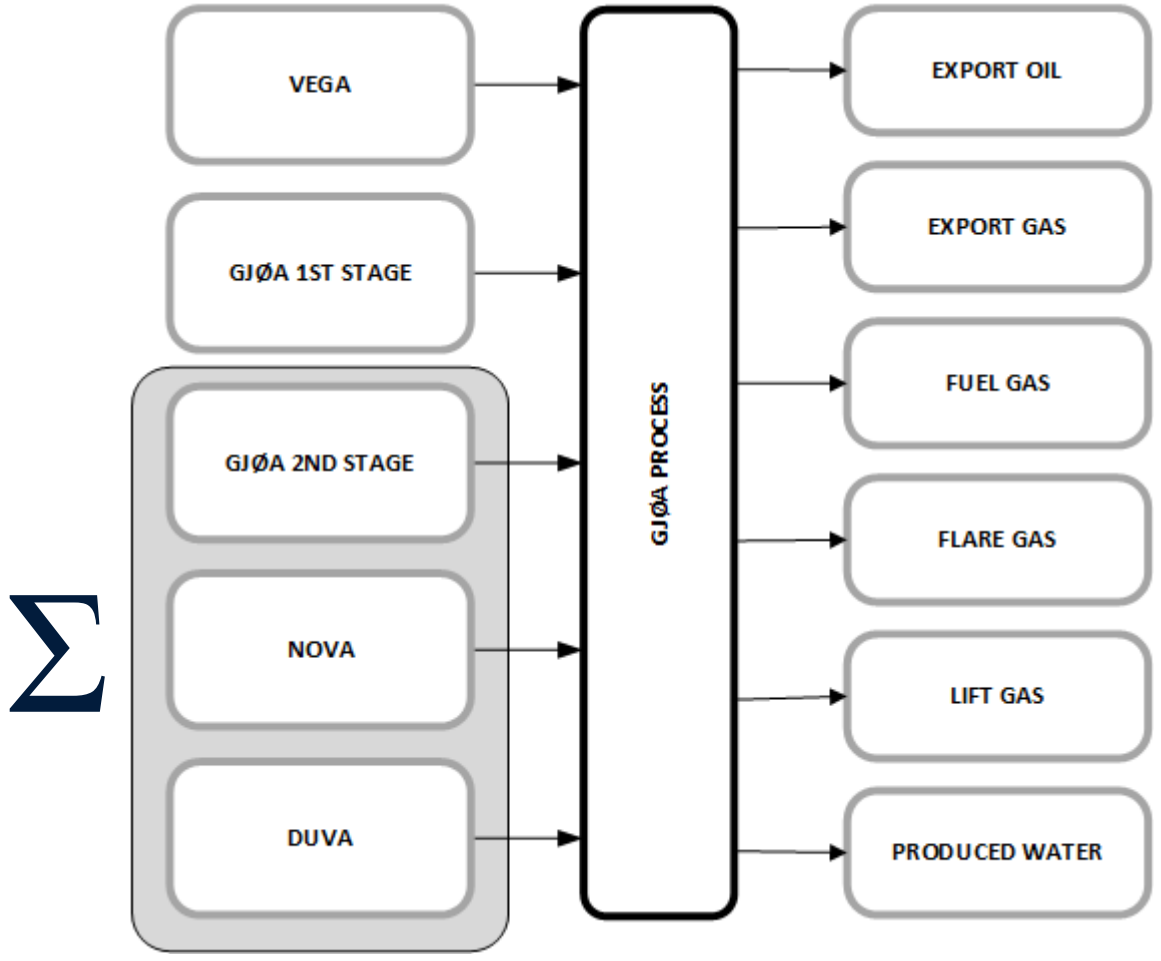
NEPTUNE ENERGY



NEPTUNE ENERGY

Key elements of the allocation concept:

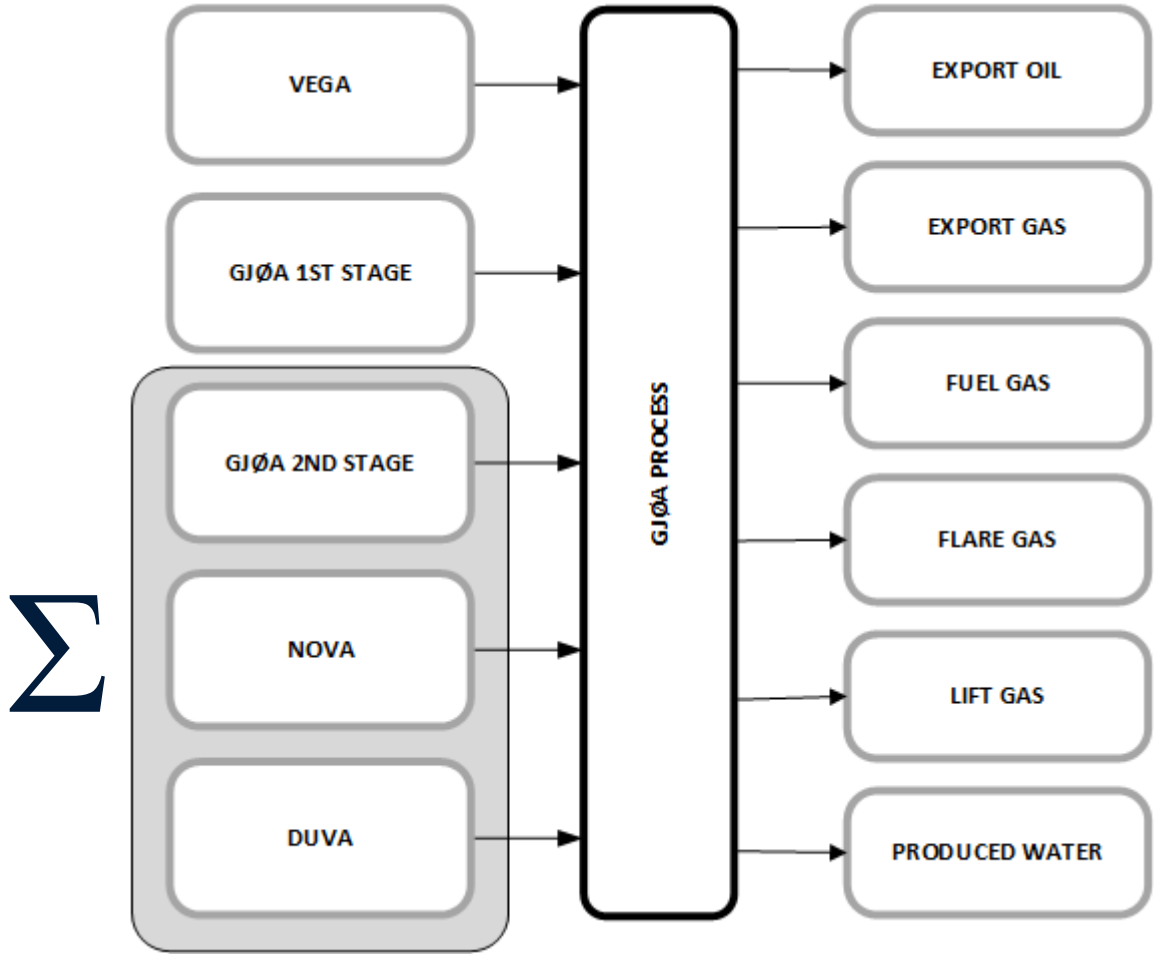
- Component mass allocation, C1-C10+, including N2 and CO2.
- Differentiation between measured producers and “by-difference” producers.
- Monthly simulated oil recovery factors, CORF.
- Fuel & flare allocation.
- Crude oil value adjustment.
- Two allocation networks:
  - 00:00 and 07:00
- Deferment handling.



NOVA AND DUVA TIE-IN TO GJØA

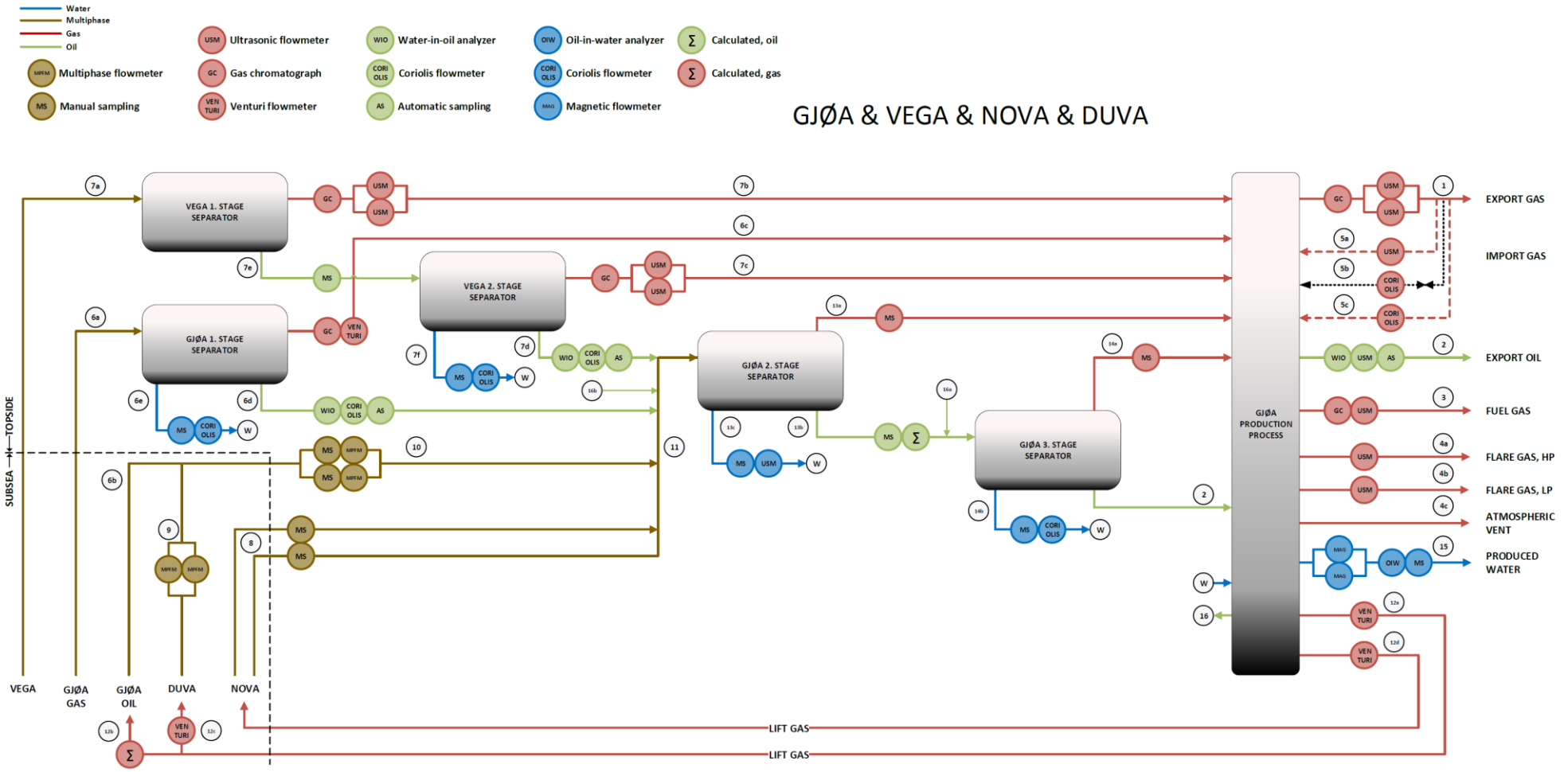
HYDROCARBON MANAGEMENT WORKSHOP 2022

- **Measured producers** enter GJØA Semi on a production separator and are equipped with single phase allocation meters and equipment to determine its composition with sufficient accuracy.
- **By-difference producers** have no production separator and no means to determine their own mass or composition through dedicated equipment with a sufficient accuracy.
- Gjøa producers routed to Gjøa 1st stage separator and Vega producers routed to Vega's 1st and 2nd stage separator are defined as measured producers.
- All producers routed to Gjøa 2nd stage separator are defined as by-difference producers
- Measured producers will get their production **allocated as measured**, corrected with component oil recovery factors.
- By-difference producers will get their production **allocated by difference**. Hence, any production which has not been allocated to measured producers. If several by-difference producers are present, their production will be allocated on a pro-rata basis among themselves.



GJØA FACILITY – KEY METERING AND SAMPLING POINTS – POST DUVA/NOVA STARTUP

HYDROCARBON MANAGEMENT WORKSHOP 2022



NEPTUNE ENERGY

PROS

- Low CAPEX developments
- “Fast-track” development possible
- Low lifting cost
- Low carbon intensity
- Flow assurance and production optimization synergies

CONS

- High uncertainty
- Meter reconciliation
- Composition
- PVT-management

NEPTUNE ENERGY

Mr. Metering | Mr. Cost | Ms. Production | Mr. Manager

NEPTUNE

ENERGY