

# Delivering value across the energy lifecycle

FIELD DEVELOPMENT GROUP

## Who we are

Subsea 7 is a **global leader** in the **delivery** of **offshore projects** and **services** for the evolving **energy industry**.

We create **sustainable value** by being the industry's **partner** and **employer of choice** in delivering the **efficient** offshore solutions the **world needs**.

### Values



### Differentiators





# Early engagement



Our Field Development Group engage with clients at the beginning of the energy lifecycle to fully understand and appreciate the key drivers, enabling delivery of optimised solutions including:

- Forming collaborative relationships
- Accelerating the development process
- Improving predictability of CAPEX, OPEX and TOTEX
- Identifying and managing risk
- Providing robust and reliable solutions.

## Developing optimised solutions

By assessing solutions holistically, we provide our clients with a consistent basis for:

- Faster solution convergence
- Solid decision-making processes
- Enhanced asset value
- Integration of enabling technologies
- Execution and delivery assurance
- Reduction in uncertainties.

## Maximising client value

We engage early with our clients to maximise the value we bring to them across the energy lifecycle:

- Earlier production and enhanced recovery
- Optimised asset economics
- Innovative and enabling solutions
- Robust execution plans.

# Field Development Group

More than ever before, operators are seeking innovative, creative and reliable field development solutions to overcome the complexities facing today's industry.

Early engagement at the beginning of the energy lifecycle helps our clients to overcome some of these technical and economic challenges. We cover every stage of the energy lifecycle, from concept evaluations and development through to execution, operational integrity management, and late-life field optimisation, through to final decommissioning. Complementary technology development and expertise helps clients extend field life and lower production costs, ensuring greater certainty of recovery and return on investment.

## Value through early engagement

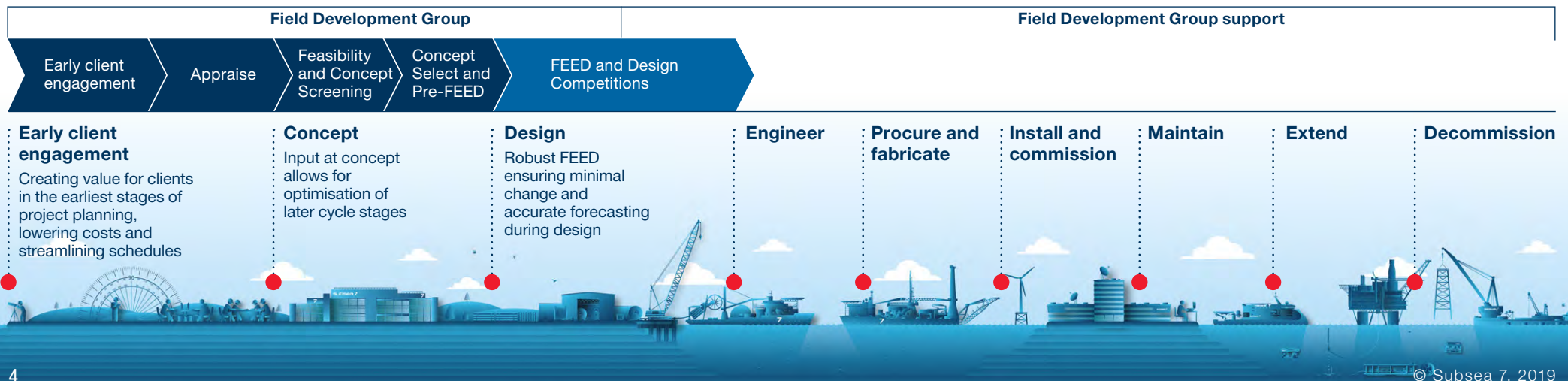
We create value by collaborating with our clients to develop concept, pre-FEED and FEED engineering services for their subsea oil and gas developments. This is centred on our industry-leading design and engineering services, pipeline, Pipeline Bundle and riser technologies. Improved project planning, assurances around constructability and risk mitigation are representative of the value that can be realised.

## Influencing the final development and arriving at the best solution

The ability to influence a development at the conceptual and planning phases can offer valuable insights into how a development progresses and may also assist in filtering out options which are too difficult or overly expensive.

## From early engagement to seamless execution

One cohesive team developing solutions, at the earliest possible stage, reducing the number of interfaces, lowering costs and streamlining schedules, enables project sanction through a combination of theoretical and practical experience. We develop project specifications, final basis of design and identify long-lead items to facilitate seamless transition to execution following project sanction.

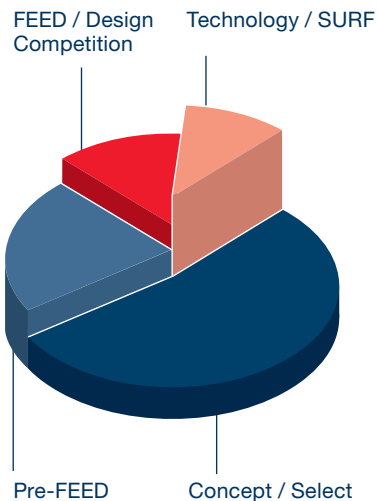


# Our supplier-led solutions

We have extensive knowledge, experience and capability delivering energy lifecycle solutions. Our locally connected teams collaborate with our clients to explore and meet their needs.

## Completed study record

Our activity levels continue to grow rapidly. Our track record covers all stages of early field development planning.

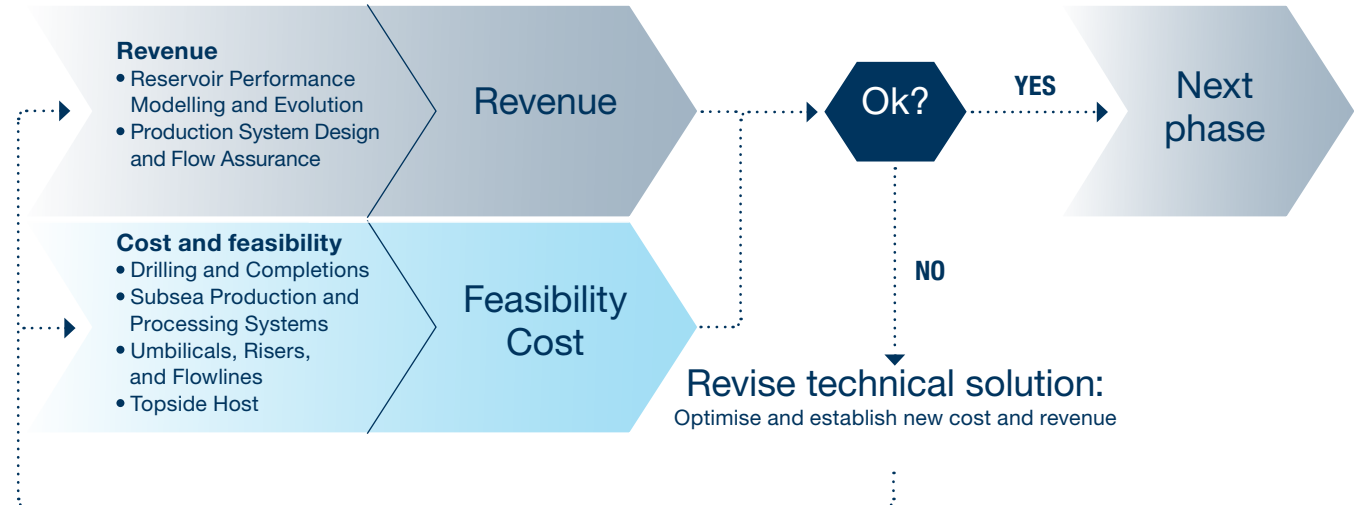




# Modern digital workspace

Our Field Development Group has established a differentiated subsea integrated field development software solution, maximising the benefits of the modern digital workspace. This new work environment will realise significant value by allowing a holistic approach to field development concept planning.

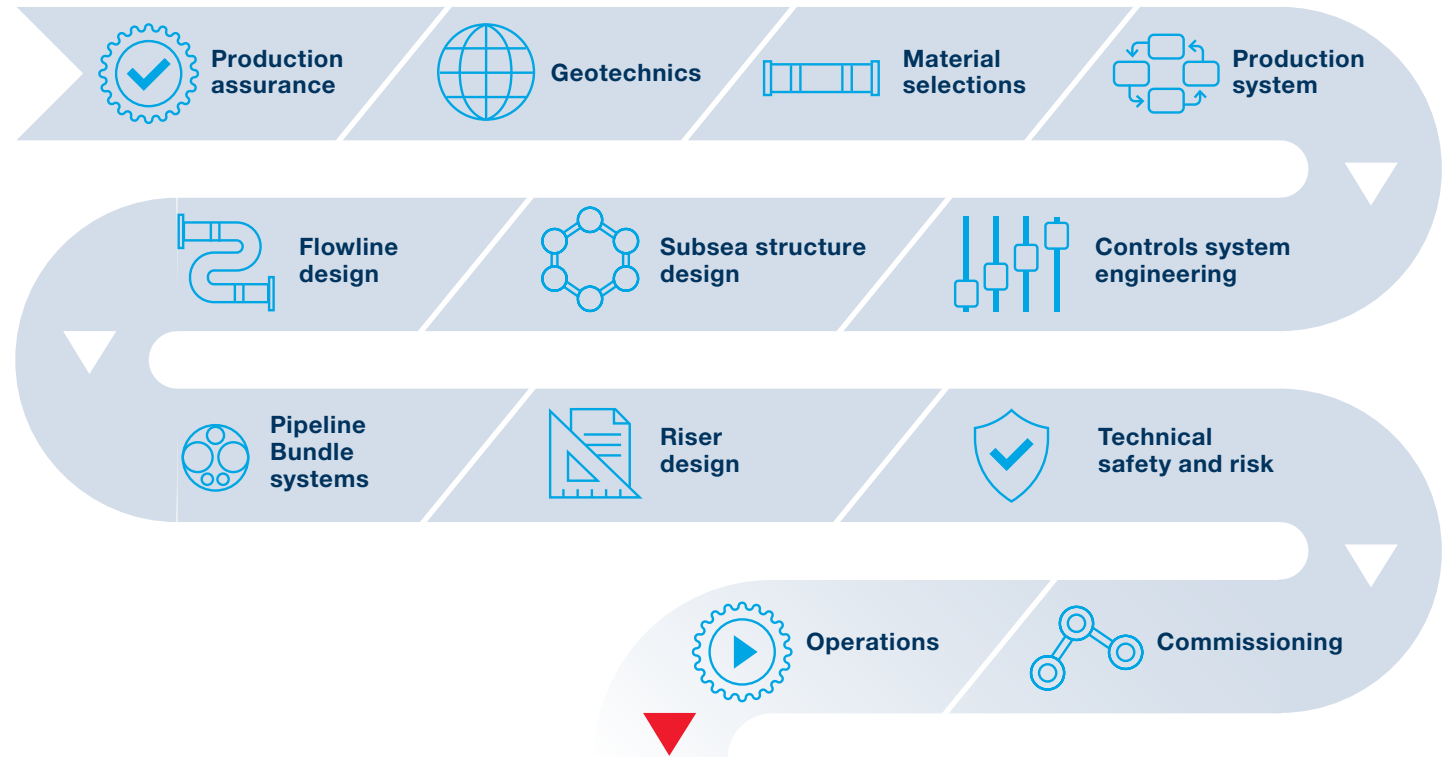
The toolset adopts a sophisticated cloud-based multi-user, multi-domain field development planning approach for the purpose of feasibility and concept screening. Planning occurs using 2D and 3D visualisation from a unique library of subsea products. The software provides an integrated platform of layout planning, system simulation and economics modelling layers.



# Evolution to solution

Our Field Development Group is focused on bringing supplier-led solutions to clients in an efficient and consistent manner.

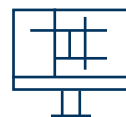
Our teams work with clients to focus on the key issues appropriate to their development needs and timeline. We access the relevant experience from across the Subsea 7 Group, and with partners, to produce the right solutions. We aim to provide clear, consistent deliverables that meet client requirements.



**Study deliverables to meet client requirements.**  
These as a minimum will include:



Summary  
report



Concept  
layout



Cost  
estimate

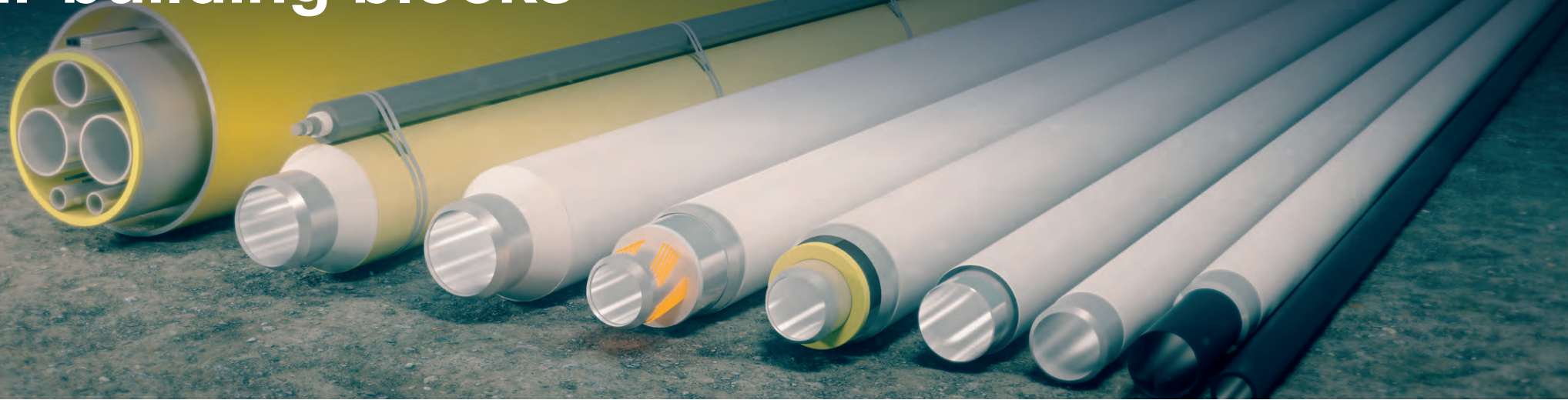


Project  
schedule



Execution  
plan

# Our building blocks



The Field Development Group works within multi-discipline teams to deliver optimised solutions.

Engineering and experience are at the heart of all our subsea designs. Our engineering specialists support projects throughout the energy lifecycle evolution from concept development to project sanction and beyond. Some of the core engineering disciplines strengths within the Field Development Group are:

- Production assurance
- Systems engineering
- Materials
- Geotechnics
- Structures
- Flowlines and risers
- Pipeline Bundles.

## Production assurance

The main challenge to any offshore oil and gas facility is defining and understanding full system process and flow assurance characteristics to maximise and maintain production rates. This is achieved by assessing the fluid properties and behaviour to determine the most appropriate multiphase transportation solution from the reservoir to the host facility.

Our approach to provide the most economic field development solution is to fully assess the characteristics of well construction and subsea infrastructure to determine the flowline and riser choices needed to operate the system safely. Thermal management is a critical aspect in defining flowline design requirement where we assess wet insulated, Pipe-in-Pipe and active heating systems when transporting hydrocarbons from the subsea well to the topside exporting facility.

## Systems engineering

Our teams have the skills to define and deliver the right field architecture solutions to enhance value in the field development process, bringing together the right disciplines to define and optimise the subsea system.

With our broad experience and ability to collaborate effectively within multi-discipline teams we are able to find the right field architecture solutions that are optimised at the system and sub-system level.

## Materials

Our materials team have extensive expertise in the fields of metallurgy, welding, material selection, pipeline coating systems and cathodic protection design.

In the early stages of field development, we offer guidance on material selection such as carbon steel, CRA and non-metallic lined pipe. We can advise on a selection of coating systems, to provide corrosion assessment and cathodic protection requirement for subsea risers, flowlines and structures. Alternative internal corrosion technologies to protect pipeline and riser systems with integrated polymer lining solutions and composites are available through collaboration with Swagelining and Airborne.



# Our building blocks continued

## Geotechnics

Our geotechnical team has a wealth of experience in design, analysis and installation of subsea foundations, pipeline and anchoring systems. The team also has the operational remit for site investigation, trenching and rock-dumping.

In the early field development lifecycle stages, we offer advice on site geohazards and geotechnical features, and develop efficient foundation concept engineering and pipeline/umbilical protection philosophies particularly suited to providing an accurate cost estimate. The geotechnical team also highlight potential areas for future work, be it in reducing the overall subsea umbilicals, risers and flowlines cost or identifying areas that require further investigation in later study phases.

## Structures

Our structural engineering team has a wealth of experience in the design and analysis of a wide range of offshore oil and gas structures. In particular, towheads, manifolds, templates and other subsea structures, pipeline end terminations and platform modifications, such as riser caissons and conductor guide replacement.

In early field development, our structural team assist in providing conceptual designs; defining the weight and size envelope for subsea structures and highlighting areas for consideration in future work, such as during installation and manufacturing that can be addressed in future phases of study work.

## Flowlines and risers

Our flowlines team is highly experienced in the design and analysis of rigid pipelines including reeled, S-lay and J-Lay installation modes for corrosion coated, wet insulated, internally lined and Pipe-in-Pipe systems.

In addition, we perform installation and in-place analysis assessments of flexible flowlines. Our fit-for-purpose and optimised flowline designs are developed by the team keeping in mind the operational requirements, in-place design, pipe mills, delivery schedules and installation vessel requirements, identifying and reducing project execution risks whilst meeting design and operational requirements. We have a full range of riser designs in-house and one of the broadest portfolios of delivered solutions in the industry. Our engineers will ensure riser concepts that meet the complex interfaces and design requirements of a delivered system and ensure an optimal solution from concept through to full life of field performance.

## Pipeline Bundles

We are global leaders in the design and installation of towed production systems and Pipeline Bundles. The Pipeline Bundle system consists of multiple flowlines, controls tubing and cables, which are all contained within a single carrier pipe. Towheads are included at each end of the Pipeline Bundle and offer the flexibility as either simple structures that facilitate launch and towing or incorporate complex manifold structures. The entire Pipeline Bundle is fully tested onsite prior to launch and towed to field using the controlled depth tow method.

In early field development, consideration is often given to both rigid flowline and Pipeline Bundle solutions in order to enable a comparison of these two options and to demonstrate which of the two options is more commercially and/or technically attractive to meet the client's requirements.

# Enabling technologies

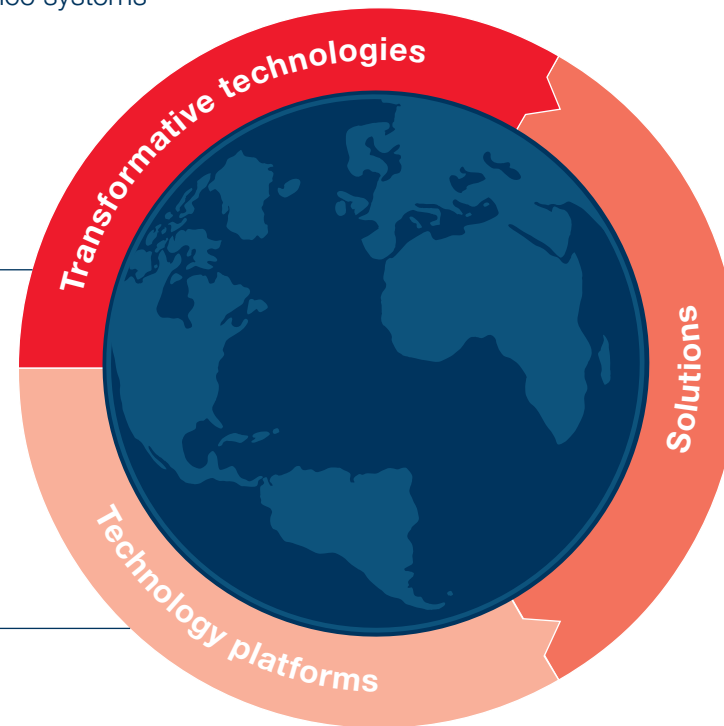
Through the strengthening of our technology portfolio and field concept design capabilities, we are now in a position to assist our clients in implementing game-changing solutions, unlocking cost savings and identifying efficiency gains.

Our innovation and new technology initiatives, focusing on three key topics, are illustrated.

The Field Development Group helps clients identify how these technologies can unlock value for their development needs.

## Transformative technologies

- Digitalisation and automation
- Subsea power distribution and electrification
- Integrated data and surveillance systems
- Environmental sustainability.



## Solutions

- Long tie-backs
- High pressure and high temperature field developments
- Deep water risers
- Small pools and lean tie-backs.

## Technology platforms

- Cost-efficient materials
- Towed solutions
- System standardisation and modularisation
- Hosted ROVs and autonomous solution
- Sensing, monitoring and repair technologies.



# Global capability and expertise

We are a global team with expertise, passion and commitment to deliver energy lifecycle solutions. Our locally connected teams collaborate with clients to explore and meet their needs.

Our network of teams work collaboratively to provide a comprehensive Field Development Planning service, drawing on expertise from across the Group and all of Subsea 7's capabilities.





[www.subsea7.com](http://www.subsea7.com)



[client.enquiry@subsea7.com](mailto:client.enquiry@subsea7.com)

