

# Appendix A

## Model Template for Developing National FDP Submission Guidelines



The Commonwealth



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### How to use this template

This document has been developed as part of the Commonwealth Secretariat publication *Field Development Plans (FDP): Handbook for Government Officials*. It is intended to support national efforts to ensure that hydrocarbon resources are sustainably developed. This **model template** can be tailored to produce country-specific FDP Submission Guidelines to aid in strengthening the regulatory framework for FDPs. National FDP Submission Guidelines should be publicly available and provide information to companies on the process and the contents of the submission for government approval.

The model template has been developed to ensure government officials receive all relevant information to enable an informed decision on whether the FDP should be approved. It has been informed by international best practice from publicly available Guidelines, materials and submissions including from Alaska, Brunei Darussalam, Gulf of Mexico, Norway, Trinidad and Tobago and the United Kingdom, and can be modified to suit the circumstances of the member country. In developing effective national guidelines from this template, the following conditions must be met:

- National FDP Submission Guidelines must be aligned with appropriate national policies, laws, regulations and petroleum agreements.
- National styles and approaches will vary but the FDP submitted to the government should address all elements contained within the guidelines.

How to use...

- 1) It is highly recommended that the entity to which the operator submits the FDP should lead efforts to develop national guidelines. Customising the template should be done with the appropriate government institutions which will be involved in reviewing the submitted FDP.
- 2) Orange colour font has been used within brackets as placeholders throughout the template. Please insert appropriate references.
- 3) Explanatory notes have been provided in various sections (either as text boxes or in grey font) to provide some context on inclusion and risk if not adequately addressed in the FDP. These are meant to be deleted.

Please note that the Commonwealth Secretariat experts are available upon request to assist member countries in the development of national guidelines.

[INSERT COUNTRY]

## Field Development Plans

### Submission Guidelines

**Title of Document:** [FDP Submission Guidelines]

**Date of Issue:** [September 2021]

**Issuing Authority:** [Ministry of Petroleum]

#### **Explanatory Notes:**

Please note importance of providing version control for national guidelines.

At a minimum, please include the *Date of Issue* and *the Issuing Authority*.

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## Section 1: Objectives of National FDP Submission Guidelines

### Explanatory Notes:

This section is intended to provide a clear overview to the operators on the national context, including:

- The regulatory framework for the FDP
- The FDP process including the government’s expectations on how it is to be engaged during the development of the FDP. This will help the operator incorporate and plan for those interactions as part of its project planning.
- The criteria the FDP will have to satisfactorily meet in order to secure approval. This will help guide the operator to ensure these areas are adequately addressed as it develops the FDP.

The following are suggested section headings and illustrative text which should be replaced with country-specific content.

### 1. Purpose of guidelines

This guideline sets out the government’s requirements for oil and gas operators in the preparation and submission of a Field Development Plan (FDP) to the [insert REGULATOR].

The [REGULATOR], pursuant to the [PETROLEUM ACT or GOVERNING LEGISLATION] is responsible for management of petroleum operations and an FDP is required under Section [indicate specific provision in Legislative Instrument].

The guidelines are generally applicable and are subordinate to the Acts and the corresponding regulations made thereunder. The objective is thus to...

- Clearly outline government expectations regarding the development of FDPs;
- Provide clarity on the form and contents of the FDP including supporting technical analysis and information to be submitted;
- Promote cooperation between operators and the [REGULATOR] for timely and efficient review and approval of FDPs;
- Provide transparency on the criteria for FDP approval;
- Make appropriate information on the project available to the public.

## 2. Regulatory framework

*Notes: This section should provide a list of relevant policies and legislation including those related to Environmental and Social Impact Assessments (ESIAs). It is recommended that the specific details are not repeated within these guidelines, but clear references to sections within National Acts and Regulations etc. are provided.*

The operator shall not enter into significant contractual obligations unless the FDP has been approved. If there is an exceptional case where the operator deems entering a particular contract prior to FDP approval is critical, an application may be made seeking approval for such. The operator must demonstrate the disadvantages/negative impacts of awaiting FDP approval and commitment. Where consent is granted, it shall not prejudice the outcome of the government's review of the FDP.

## 3. Government-operator interactions

The government recognises that the nature and complexity of a particular oil and gas project will have implications on the FDP submission. Additionally, as companies' circumstances and project management processes for progressing a discovery to first production differ, they could also have implications and in particular will influence the timing (e.g. at concept select or closer to final investment decision "FID"), availability of information and uncertainties contained in submissions. Consultative and collaborative approach will help both the operator and government to prepare and effectively deal with issues as they arise during the development of the FDP.

The operator is thus expected to involve the relevant government agencies during the planning phase of a new project to facilitate efficient approval of the FDP. This will help to identify any potential issues early in the process, enable timely resolution of mutually acceptable solutions and facilitate efficient processing of submitted FDPs. In furtherance of this...

- The operator should consult with [the Regulator] and establish government reviews on the development of the FDP, especially at critical milestones. *[As far as possible, engagements on the FDP should be done via the existing technical review meetings between the Regulator and the company. For example, via the Joint Management Committee/Technical Coordination Committee under the Petroleum Agreement.]*
- [The Regulator] expects the operator to provide, at a minimum, the following in the period prior to submission of the FDP; Field delimitation, volumetric assessments – hydrocarbons in place.
- It is recommended that the operator furnishes [the Regulator] with copies of studies and analysis to support the conclusions reached, or positions taken in the proposed FDP in a timely manner.

After approval, the operator shall perform all subsequent activity in accordance with the FDP. Annual work plans and budgets are therefore to be consistent with the approved FDP and any deviation will require government approval. The government expects the operator to maintain ongoing interactions and provide early indications of potential variations that will be requested. This will help identify any potential issues as they arise and enable timely resolution of mutually acceptable solutions.

#### 4. FDP submissions and approvals

For a submission to be considered valid, it requires...

- 1) The *proposed FDP*, or *proposal for variation to an approved FDP*, to be submitted within stipulated timeframe as per regulations/petroleum agreement [*For example, XX days after declaration of commercial discovery*].
- 2) The submission contents must conform to government guidelines. Please see Section 2 of these guidelines for *Proposed FDP* and Section 3 for *Variation to an Approved FDP*.

The submission must be in the form and manner stipulated by the regulator. [Please replace with details on how the operator should submit its proposals and the format required. For example, “*Please submit two hard copies and an electronic copy in text-search format to regulator, as well as hard copies to the National Oil Company and the Ministry of Petroleum*”. Or “*Regulator uses a service platform to allow operators to send files securely. Please email regulator.gov to ensure that the FDP can be submitted as per time period described above*.” Or “*The operator should consult with the regulator on the number of hard copies of the FDP to be submitted in addition to the digital copy*.”

- 3) [*Any other requirements that the operator must meet should be described*]. For example, some jurisdictions use application forms for FDP variations and have accompanying fees.

The government recognises that no two projects are the same and will evaluate an FDP submission on the risks and rewards of the specific development. For approval of any project, the operator will have to demonstrate that...

- 1) The FDP is formulated in accordance with international best practice and promotes efficient and optimal recovery of petroleum resources;
- 2) Appropriate measures will be implemented to effectively manage health, safety, security and environmental risks across the project lifecycle, i.e., design, construction, production and decommissioning phases;
- 3) A robust stakeholder engagement plan will be developed and followed;
- 4) There are demonstrable financial benefits to [the COUNTRY] from the development;
- 5) The project minimises Green House Gas (GHG) emissions and is resilient to climate uncertainties.

The regulator will communicate the decision in writing [within XX days of FDP submission], including any conditions.

## Section 2: Contents of an FDP submission

### Explanatory Notes:

**The FDP submission to the government should address all elements contained within this Template.** The section headings and text should be replaced with country-specific terminology and content; however, the key areas should not be deleted. This template has been designed to ensure that information on the key aspects of any petroleum development is addressed in the request for approval.

Throughout the Guidelines, please ensure definitions are consistent and state specific technical standards, units and formats to provide clarity to operators and minimize re-submissions. For example

- In some legal frameworks, the terminology ‘field’ or ‘development area’ may have different meanings in the fiscal regime. Within these guidelines, ‘field’ is used to denote the petroleum deposits that the development is based on.
- What is the preferred Co-ordinate Reference System (CRS) to be used when referring to positioning? Latitude/longitude, UTM or both? Every country has a CRS list available for use. [EPSG.io](http://EPSG.io): Coordinate Systems Worldwide
- State units of measure. e.g. feet (ft) or meter (m).
- Are there any standard forms for data reporting?

The FDP submission should provide the government with a holistic view of the development project. This section outlines the relevant areas and information that should be provided. Pertinent information relevant and supplementary to the contents of the FDP should be submitted in the appendices or as separate attachments, where possible. These include reports, independent assessments, agreements, and other relevant material.

The government recognises that each project is different and, depending on its nature and complexity, some subsections may not be applicable. Or, conversely, more information may be required. The operator should consult with the regulator on the specifics of a submission to ensure all documentation is provided in a timely manner.

## PART I: Executive Summary of FDP Submission

### Explanatory Notes:

An FDP submission is a holistic view of a development and as such will be associated with many technical assessments and reports. If clear instructions are not provided on the structure of the FDP submission, the voluminous data can be overwhelming and to the detriment of understanding the critical assumptions behind the development and the inherent risks.

Best practice is for a succinct non-technical summary of the project (including risk management) and how the country will benefit from the development. This approach also has the added benefit of enabling this part of the FDP to be the basis for broader government discussions (e.g. cabinet and or Parliament) and for consultations (e.g. among government agencies or with the public).

This section should provide a comprehensive summary of the key components of the FDP submission. In effect, it is a brief overview of PART II of the FDP submission and it should enable a non-specialist reader to reach an informed opinion about the proposed development. More specifically, the summary should adequately address how the proposal meets the required conditions for approval as described in Section 1 of these guidelines.

It should include an overview of:

- The development strategy and preferred concept selected. Particulars of the contract area (map, beneficial ownership, exploration history, estimates of total petroleum deposits), development strategy for optimising petroleum recovery from the contract area, scope of the FDP (field location, petroleum deposits included), possible concepts and rationale for selected option including comparative economics. Indicate relevant assumptions and decision criteria.
- The proposed project. Range of estimates for resources and production, description of the drilling and completion campaign, facilities and infrastructure, expected operating efficiency and other key matters. Provide a summary table of a base case, upside and downside for key project parameters including hydrocarbons in place, recoverable resources, reserves, production, capital costs, operating costs.
- How Health, Safety, Security and the Environmental (HSSE) has been integrated into the design and operation of the proposed development. In particular provide summary of Section 6.6
- The decommissioning plan for the development

- The social and economic impacts of the project with description of the overall expected benefits to the country under three scenarios (base case, upside and downside).
- The project schedule, noting key milestones including first gas/oil date, critical path activities and measures that will be employed to effectively manage risks and ensure delivery of the project on time and budget.

## PART II: FDP TECHNICAL ANALYSIS AND EVALUATION

### Explanatory Notes:

The operator and government technical teams should be engaging throughout the process of moving from discovery to FDP submission. Ideally, the government technical teams should have line of sight to many of the supporting detailed assessments and reports ahead of the formal submission. It is thus recommended that, where possible, a synopsis of such reports is provided for the FDP submission. For completeness in the government's record keeping those submitted as appendices/separate attachments

Part II of the submission should provide a comprehensive review of the technical analysis and evaluation of the FDP elements. For each section the description should be brief and focused on the complexities and risks of the development. Where possible, appropriate documents and reports should be referenced and attached separately. Where a particular subsection is not relevant to a development, this should be discussed with [the Regulator] and omitted.

### 1. Contract Area Development Strategy and Scope of FDP

This section is to provide context on the FDP by providing details on the contract area and to describe how the proposed option (selected concept) for developing the nation's petroleum resources optimises value to the country and what the key risks are. Areas to be covered include:

#### 1.1 Contract area description

Provide overview and status of the governing contract/licence (contract area, beneficial ownership, duration), exploration history, other planned activity which may have a bearing on the field, and other potential areas of development. Include a map showing the contract area, field location and where relevant other developments, prospects/leads. If appropriate, also describe other contract areas e.g. unitisation.

#### 1.2 Area development strategy and scope of the FDP

Address the holistic strategy for development of petroleum resources in the contract area. Analysis of government revenue flows will be expected in support

of the development strategy. Please see required economic metrics. Clearly outline the scope of petroleum accumulations to be included in the FDP and estimates of other petroleum resources in the contract area which are not included. If appropriate, also describe the implications for other contract areas. For example, if there are discoveries or potential for such or existing developments in other contract areas. Specifically address the strategy for dealing with non-associated gas.

For multi-phase developments: If the operator considers it more advantageous or efficient to develop a field(s) in multiple phases, the rationale and assumptions should be clearly documented. The operator will need to demonstrate this type of phasing will not be detrimental to the development and the ultimate recovery of petroleum resources and value to the country. To the extent possible, information should be provided on each development phase including timeline, costs, future facilities integration, and requirements.

For unitisation developments: Summarise the key terms and conditions of the unitisation agreement which shall be attached as an appendix.

### 1.3 Development concepts and proposed project development option

Provide an overview of the development concepts considered and describe the rationale for selection of the preferred option and the robustness of the selected project. This should include...:

- Advantages/disadvantages associated with various options (e.g. resources, location, cost, technology, HSSE, economics etc.) and assumptions. Where relevant, a detailed account on the options for treatment of non-associated gas is to be provided (e.g. pressure maintenance or recycling, domestic use).
- Decision criteria and rationale for selected development concept. A comparison of project economics and government take on different development scenarios is to be provided. Include summary table for required economic metrics. If selected option includes any intended innovative or new technology applications provide justification for inclusion.
- An account of how flexibility has been incorporated into the proposed project given in [Section 1.2](#) and [1.3](#), particularly potential for tie-backs.
- What uncertainties (including future business opportunities) may require fundamental changes to the proposed development concept. How does the operator intend to manage those risks? *[This is to provide early indication of areas of the project that the regulator should subsequently pay attention to and engage with the operator re: potential request for variation to an approved FDP].*

## 2. Field Description

**Please note the importance of alignment of definitions. In some legal frameworks, the terminology ‘field’ or ‘development area’ may have different meanings in the fiscal regime. Within these guidelines, ‘field’ is used to denote the petroleum deposits that the development is based on.**

### 2.1 Field overview

Provide an overview of the field on which the proposed development has been based. Key elements to be included are:

- *Field location:* Maps showing the license area, co-ordinates, surface location of any proposed facility, structure or installation. Include aerial maps and cross-sections showing outlines of hydrocarbon-bearing reservoir segments and field limits.

For OFFSHORE locations: A bathymetric map showing the surface locations of nearby facilities/installations with surface and subsurface location of wells and water depths.

For ONSHORE locations: Cadastral sheets showing location of nearby infrastructure, houses/habitation, farms, pipelines, schools, rivers etc. All wells and their surface and subsurface locations (plus related facilities) must also be shown in the location map.

- Provide a brief description of technical aspects of the reservoir(s) and estimates of the hydrocarbons in place, the geological setting, trapping framework (stacked pay vs separate fault blocks) and reservoir aerial extents. At a minimum, a representative structure map, field cross-sectional view indicating the reservoirs of interest and the in-place volumes. Volumes to be shown for each appropriate reservoir unit(s) by oil/gas with description and quantification of the uncertainties.

### 2.2 Geology

Provide geological data together with all current interpretations and integrated analyses, including:

- Regional geology and tectonic context
- Well log 2D correlation panels, analyses and interpretations should reflect the basis for subdivisions, reservoir zonation and demonstrate reservoir continuity
- Field stratigraphic framework (reservoir and sequence) including chrono-stratigraphy and biostratigraphy
- Facies variations and other relevant geological factors that affect reservoir properties

- Type and composite logs
- Sedimentological, depositional models and studies
- Isopach, porosity, net to gross maps
- Field structural framework: structural restorations, Allan diagrams, fault maps, integration of dip meter/image data
- Reservoir compartmentalization – potential flow barriers and baffles, highly permeable layers
- Petroleum systems modelling and analyses

### 2.3 Geophysics

Provide geophysical data together with all current interpretations and integrated analyses including:

- Seismic surveys with shot-point maps and seismic datasets used for generating current interpretations
- Seismic interpretations including seismic-to-well ties demonstrated on interpreted 2D seismic sections through wells
- Depth conversion methodologies
- Modeling studies
- Velocity models, maps and 2D profiles
- Seismic interpretations on dip/strike cross sections of the reservoir structures
- Structural configuration of the field represented by top structure maps (depth/time) for the key reservoirs
- Reservoir characterization using attribute analysis techniques including coherency and spectral decomposition maps

### 2.4 Shallow hazard assessment

Demonstrate that seafloor, shallow and synthetic subsurface geohazards have been assessed and incorporated into facilities placement and drilling design. For example, describe results of any high resolution 2D/3D seismic interpretational analyses or studies that provide insights on slope stability and sediment surfaces, reservoir compaction and possible subsidence.

### 2.5 Petrophysics

Petrophysical data together with all current interpretations and integrated analyses, including:

- Well log analyses, reservoir zonation and data QC
- Core data and special core analysis (SCAL) including core porosity, vertical and horizontal permeability, initial saturations, capillary pressure, and relative permeability

- Comparison of laboratory analyses (core plug measurements and water analyses) with data derived from logs
- Average reservoir characteristics including porosity, permeability, initial water saturations, capillary pressure, relative permeability including cut-offs criteria
- Well test data
- Field PVT descriptions, formation temperatures
- Formation pressure analysis and interpretation
- Fluid chemistry and analyses including fluid composition and properties
- Pressure data, fluid contact assessment from well data
- Rock properties and modeling studies
- Petrophysical interpretation methodologies and findings
- Use of field analogues or correlations.
- Methods for correcting measure depth (MD) to true vertical depth (TVD) and true vertical thickness (TVT) to true stratigraphic thickness (TST)

## 2.6 Reservoir engineering

Provide reservoir engineering data together with all current interpretations and integrated analyses including:

- Fluid composition – quality, chemical, physical properties
- Fluid chemistry
- Fluid data analysis – PVT data and analysis of fluid responses present
- Reservoir gas PVT (gas condensate, wet, dry)
- Separator pressure, temperature, dew point pressure, GOR and CGR of gas reservoir at standard conditions
- Z factor,  $U_g$  and  $B_g$
- Initial reservoir, saturation pressures, reservoir temperatures
- Saturated oil density, API, viscosity,  $B_o$ , CGR, GOR
- Rock-fluid interactions
- Pressure depletion studies
- Aquifer properties and reservoir drive mechanisms

## 2.7 Reservoir modelling and simulation

Dynamic reservoir modelling can be represented by either an analytical method, some form of numerical simulation or a combination of both. In this section, the specific modelling approach(s) used for the reservoirs, available datasets used and the basis for any subdivision into flow units and compartments should be described. Key discussion points should include but not be limited to:

- Outcomes of any material balance modelling work and any reservoir (geological) simulation models built for the reservoir(s) of interest, utilising seismic and geological, reservoir and flow unit descriptions, trajectories, fluid data, initial condition, historical production data and pressure performance data to forecast well and field performance for reservoirs in the planned development. Notable outcomes may include:
  - Discrepancies with calculated volume between static and dynamic volumes in place
  - Various drive/depletion mechanisms, extent, and strength of any aquifer(s)
  - Potential well trajectory optimisations
  - Impact of uncertainties and where applicable, any sensitivity analysis
  - Implications on history matching and predicted production performance where Drill Stem Testing (DST) data or Extended Well Tests (EWTs) information has been integrated for well optimisation

It should be noted that for a phased development where pressure and production data maybe available from existing phases, history matching should be done to give more accuracy in the prediction. It should be done for pressure, oil, gas, and water production data. In case of poor match, operators should highlight any adjustment in reservoir parameters.

In cases where there is insufficient data available, use of generic data should be highlighted.

## 2.8 Subsurface risk and reservoir-management plan

The operator is expected to describe subsurface uncertainties (positive and negative) that could impact the proposed development plan and mitigation strategies. Risks during pre-start up phases and post production should be discussed. This part of the FDP submission should include:

### (1) Volumetrics and resource estimation

Describe the resource estimation methodology, volumetric assessments and uncertainty analyses conducted for the reservoirs in the planned development. For phased developments, the expected recovery rate and recoverable volumes should be presented for each phase. Discussion points should include:

- The initial hydrocarbons volumes in place
- The estimated oil, condensate and gas recoverable reserves and associated recovery factors under the selected development option
- Possible contingent resources
- Assigned resource and reserve categorizations (proven, probable, contingent) [Please see box below]
- Key assumptions underpinning the development's proposal

- Descriptions of the cause and degree of uncertainties in the estimates
- Recovery; evaluation of recovery strategies (e.g. depletion, pressure maintenance, aquifer support) and selection criteria for optimal drainage

### **Explanatory Notes: Reserves Reporting**

The reserves estimate is inherently imprecise and will be revised over the life of a field. There are different reserve classifications used but estimates often expressed using “proved“ and “unproved“. Unproved may include “probable” and “possible” or “contingent resources“. The government should provide guidance to the operator on the country’s reserves reporting guidelines. For example, Society of Petroleum Engineers (SPE) Petroleum Resources Management System (PRMS)

#### (2) Reservoir production strategy

Describe how the reservoir(s) will be produced and managed to maximize economic recovery of the overall development while adding value. As part of the reservoir production strategy discuss:

- The selected production strategy for the proposed plan, taking into consideration if it is a single phase or multi-phase development
- Short, medium and long-term production plans/schedule including impact on production acceleration and recoverable reserves
- Number of wells, well type (e.g. producer, injector) accompanied by perforation schemes and completion diagrams
- Stand-alone vs co-mingling reservoirs
- Recovery rate sensitivity analysis
- Fit-for-purpose technology to be implemented with known sensitivities and limitations/constraints
- Expected production profiles and recovery rates for oil, gas and condensate/NGL, water production for the entire field(s) and by reservoir zone or other production facilities, if applicable. Include upside, base case, and downside profile view with associated assumptions. Include some description but not limited to how the uncertainty regarding resources, recovery rates and start dates are considered.

For oil rims, the following additional information should be submitted to provide assurance around adequate GOR control, implemented prior to deliberate production of cap gas:

- Gas production control plan for each reservoir
- Solution gas/oil ratio (GOR) and recommendations for GOR control based on reservoir characterization, subsurface uncertainties, and field development and production plans

- Recommended produced GOR limit
- GOR monitoring plan, including key performance indicators (KPIs)

(3) Secondary recovery screening and methods

Describe evaluations of conventional and beyond conventional recovery methods such as enhanced oil recovery (EOR) and enhanced gas recovery (EGR), proposed to be deployed during life of field for the development. Describe outcomes of any EOR modelling studies or screening efforts. If enhanced oil recovery techniques are not being considered, the operator should justify why they are not being used.

(4) Reservoir and well performance

Where Drill Stem Tests (DSTs) or Extended Well Tests (EWTs) have been performed (during Appraisal phase), any possible implications of these on the field's future production performance should be noted. The potential for scaling, waxing, corrosion, sand production or other production issues should also be highlighted with potential mitigations for optimal reservoir management.

(5) Field depletion planning

The principles and objectives when making field management decisions, conducting field operations, and maximizing economic hydrocarbon recovery over the life of the field should be described and documented in a reservoir management plan (RMP). Key points for discussion include:

- If the field is to be developed in phases, a view of which reservoirs will be developed in each phase with the projected timings
- Any future technical studies and surveys considered
- Potential for re-completions, workovers, re-perforations, and further drilling
- Potential measures to increase available capacity over time
- Mapped and unproven deposits in the area that may generate opportunities for growth and additional production

(6) Field data acquisition plan and reservoir surveillance

Provide a detailed description of the key objectives and the subsurface data to be acquired for the proposed development during the relevant stages. This will help resolve or reduce existing uncertainties and assist with understanding dynamic performance.

Two key aspects to consider involve, firstly, data collection during the drilling phase of the development such as well logs, cuttings, cores, pressure, seismic VSP profiles and surface samples. And secondly data collection (field

monitoring and surveillance) once field comes on production such as pressure build up tests (PBUs). Discuss:

1. Justification/value of information (VOI) assessments and outcomes that support the planned data gathering program
2. Additional seismic data acquisition or execution of any seismic reprocessing work during the appraise-select phases
3. A proposed surveillance schedule for dynamic data capture post field startup and first production

#### **Explanatory Notes:**

Value of information (VOI) analysis evaluates the benefits of collecting additional information prior to making key subsurface decisions about data acquisition for the planned development to help reduce uncertainties.

VOIs are essential to underpin decisions around the type of data, quality of information being acquired and the value it brings to the development. This type of analysis can distinguish between constructive and superfluous information.

It is especially useful when considering data acquisition that is not the norm.

## 2.9 Database

A brief description of the integrated dataset used to support the definition of the subsurface activities and deliverables (e.g. field volumetric estimation, static and dynamic models) in the FDP.

<b>Requirement</b>	<b>Content description to include but not limited to:</b>
Geological, petrophysical & logging, fluids and well test data	All exploratory appraisal data taken from previous well(s) drilled and quality, including but not limited to log data, borehole data, core data, biostratigraphy data, pressure data, fluids and well tests
Seismic data	All seismic surveys and datasets used for appraisal and any reprocessed volumes used for current interpretations (incl. AVO products, velocity models) with details of data basis, aerial coverage and fold, vintages, quality of seismic data

### 3. Drilling and Completions (D&C)

The effective design and execution of drilling and completions activities are critical to successful delivery of expected outcomes to the country. It is important in maximizing production, cost efficiency (D&C is significant portion of capex and decommissioning spend) and carries significant HSE risks (blow-outs etc.). **The operator is to demonstrate how D&C activities conform to international best practices, support optimal petroleum recovery and how risks have been identified and will be managed.** This shall include information on:

#### 3.1 D&C programme

Key aspects to include are:

- Drilling location and details of any site survey and assessments of land and seabed conditions for relevant features and hazards (e.g. geohazards such as shallow gas, hydrates, cables, pipelines, anchor-holding demands and sea traffic)
- Rig selection and procurement strategy. Provide specifications of the selected rig type (e.g. bottom supported, jack-ups or floating units, submersible, semi-submersible or drillship) and the rationale for selection (e.g. Onshore: portability and maximum operating depth. Offshore: water depth, meteorological and tidal conditions).
- Number, type of wells (e.g. producer/injector) and timing to produce petroleum deposits included in the FDP submission
- Provide rationale for approach to drilling activity (e.g. batch, pre-drilling of development wells)
- Cementing strategy and procedures. Discuss the criteria for zonal isolation during well construction and future abandonment phases
- Sand control measures and management strategies. Discuss any applicable field analogues
- Data acquisition plan e.g. coring, logs/logging while drilling (LWD), pressure tests, well integrity, leak-off tests (LOT)/formation integrity test (FIT) etc. [particular attention should be given to use of data for managing risks and uncertainties.]
- Discuss possible well work/well intervention plans and future application of well stimulation methods (hydraulic fracturing, acid stimulation jobs etc.)
- Approach for accessing key components, critical spare parts and back-up equipment with long lead times
- Costs estimates. Provide underlying assumptions for costs and benchmarking

### 3.2 Well design

The operator is not required to submit detailed basis of design (BoD), equipment designs and operating procedures in this section as these will be required as part of the approval process for drilling and completion activities. Such subsequent submissions should be consistent with Section 3.1 above, and any deviations must be explained. This section should describe the initial views on BoD and well design such as:

- Well path and reservoir target requirements. Describe scoping trajectories and drilling feasibility work or assessments to select optimal well paths to the reservoir target take points, as well as the relative simplicity/complexity of the wells. Include well placement spider plots with plan view layouts for either platform or subsea. Discuss well collision risks based on anti-collision work. For well paths close to lease boundaries, the positional uncertainties should be documented.
- Drilling design considerations and requirements including offset wells, wellbore stability studies and modelling, bit selection, casing design methodology, casing and liner setting depth considerations, HPPT design, drilling fluids and mud weights.
- Slot design, number of wells/manifolds, well slot/drilling pad locations
- Completion design and considerations including tubing size, completion type (OHGP, CHGP), number of zones (single vs multizone), use of intelligent completions and smart well technologies.
- Geological prognosis, uncertainties, and site survey information if available
- Temperature, pore pressure, and formation strength prognosis including pore pressure and frac gradient (PPFG) assessment.
- Wellhead systems and the Christmas trees (wet vs dry)
- Hole cleaning and hole stability requirements
- Production or injection requirements
- Offset well data analysis including non-productive time
- Safety and environmental protection measures

### 3.3 Safety and environmental-protection measures

Description of the safety and environmental protection measures particularly.

- Specifications of the Blow Out Preventer (BOP) system and blowout contingency plans. Key discussion points to include:
  - Evaluation of blowout scenarios and kills methods
  - Mobilization of necessary emergency equipment, personnel and services
  - Description of suitable locations for drilling of relief well(s)

- Evaluation of relief-well profiles and casing program
- Available equipment including possible rigs or facilities for well intervention options
- Plan for disposal of drill cuttings, chemical and fluid discharges

### 3.4 Plug and abandonment

Provide a brief description of the plug and abandonment strategy, design and estimated cost.

### 3.5 Risk management

Provide a description of potential technical and operational risks for the drilling program. Discuss any initial risk analyses done and outline mitigation plans.

## 4. Facilities and Export systems

This section should provide all relevant information on the proposed production and export system to take petroleum from the field to point of sale. Where analyses, reports and other documents can serve as supporting material/evidence, please include a summary of the relevant issues and include as separate attachments. The type and configuration of the production and processing facilities, storage, pipelines and transportation infrastructure can vary significantly. The evaluation of alternative concepts and rationale for the proposed development option should be discussed under Section 1. This section should provide details on the selected development option.

### 4.1 Production facilities

Provide an overview of:

- The basis of design, citing applicable laws/regulations, industry codes/standards, assumptions and considerations used for selected facility option such as:
  - Quantity and composition of the hydrocarbons
  - Seismic and subsidence considerations. If there is a risk of subsidence where the facility is to be installed, details should be given of the consequences this could have for the facilities, as well as which measures will be implemented to secure the facilities. A description of the impact of seismicity to the facilities and how they have been designed to withstand any seismic activity should be given. [e.g. Global standard design requirements exist for seismic events such as an event every 1000yrs vs 1 event every 10000yrs. Specify the codes that will be used for design level(strength)/safety(ductility) of the facility]
  - Meteorological and Oceanographic Conditions. The impact of weather conditions (normal and storm) on design and operability.
  - Vulnerabilities to potential climate change impacts

- Location and description of the facility and all major structures, plant, equipment and safety systems (e.g. design life, capacity, structure specifications). Detailed engineering drawings, schematics and illustrations to be provided. Discussion areas to include:
  - Proposed facility location, distance to nearby facilities and, for offshore developments, water depth and distance to shore
  - Configuration and layout
  - Drilling or workover equipment and systems
  - Equipment and systems for collecting, separating, processing and treating hydrocarbons, produced water, waste, drill cuttings, other discharges and emissions. If relevant, features to handle high-wax content or pour point problems
  - Fluid treatment and injection facilities
  - Process control and their interconnections with other facilities
  - Measuring, allocation and fiscal metering systems
  - Access routes. Primary and secondary access e.g. evacuation/rescue
  - Electrical/power systems, general utilities and energy efficiency
  - Accommodation
  - Safety equipment and systems including an account of safety/buffer/exclusion zones
- A process flow diagram, which indicates the fluid analyses, operating pressures, temperatures, throughput volumes and capacities.
- Overview of technical and risk evaluations completed to ensure proposed design and operation includes measures to ensure safety and protection of people, plant and the environment including the prevention and minimisation of discharges and emissions (e.g. flaring, methane and fugitive emissions).
- Cost estimates. Provide underlying assumptions for costs and benchmarking
- Potential system bottlenecks and limitations that may give rise to production constraints with details of contingencies to maintain production in the event of system failure(s).
- Flexibility to adapt to changes (e.g. resource base), potential satellite developments/tie-ins indicating spare capacity

For offshore fixed/floating systems, in addition to above also include:

- The marine systems of a floating structure including the general utilities and facilities for mooring, propulsion, and ballast.

- The functional requirements for systems such as well conductors, J-tubes, risers, riser handling, seawater supply and discharge, shale chute

For offshore subsea systems, in addition to above, also include:

- Satellite wells, clustered wells, or template wells
- Components such as well foundations, wellheads and trees, flowlines and end connections, production risers, controls, control lines and fluids, templates, manifolds, shutdown systems, materials and corrosion control
- Overpressure protection philosophy
- Intervention strategy

#### 4.2 Transportation and export systems

Overview of the route and system for transporting hydrocarbons and other substances to and from facilities providing details listed under [Section 4.1](#), as appropriate.

#### 4.3 Tie in with other fields and/or facilities

Discuss any tie-in aspects of the proposed development on sea or land.

- If existing facilities are to be used, provide a description, including any necessary modifications that would need to be completed, because of the planned tie-ins.
- Technical opportunities identified or assessments carried out on possible future tie ins of other hydrocarbon fields in the area of the planned facility.
- Analyses of any commercial and safety consequences for the field or facility proposed if third parties are to utilize the facilities, infrastructure, and services.
- Expected available capacity on the planned facility and potential measures to increase available capacity.
- If entering into any agreements for use of facilities owned by others, include documentation describing the key elements of the negotiation process and agreements made including tariffs, the physical and ownership boundaries between both parties.

#### 4.4 Associated production and other profiles

Expected production profiles for total liquids, oil, gas, gas usage and flare, associated gas liquids and produced water for the life of the field are required. Where fluids are to be injected, annual and cumulative injection profiles should be provided.

## 5. Operations and Maintenance

**This section should provide the expected overall operating efficiency (OE) and reliability of the proposed development and the detailed factors and plans for achieving them.** The operator should provide a description of the:

- Operations and maintenance philosophy, strategy and processes and an account of how they have impacted the facility's design and equipment selection. e.g. the rationale for manned or unmanned installations/remote operations, system redundancies, predictive maintenance etc.
- Organisational structure and manpower requirements
- Approach towards inventory management (e.g. critical spare parts, back-up equipment with long lead times)
- Logistics operations and support systems (e.g. onshore supply base, support vessels, helicopters). (e.g. personnel movement for unmanned installations)
- Communication systems
- Reliability and integrity management plans including:
  - Elements that are critical to operations e.g. pump system, seals (risers etc.), Tank venting system, deck structures (e.g. walkways, plating)
  - Corrosion management plans
  - Inspection and maintenance plan e.g. surveillance equipment and procedures, scheduled maintenance, turnarounds and inspection programs (e.g. monitoring integrity of platform, pipeline, and other installations) and well workovers. Note if any special maintenance, inspection and repair equipment or vessels are required, and whether the intention is to acquire such vessels or to hire them on an "as-needed" basis.
- Expected overall operating efficiency (OE) and reliability of the proposed development. Underlying assumptions should be discussed, including system redundancies, well workovers and downtime (e.g. severe weather conditions)
- Key operational risks and plans for monitoring and management

## 6. Health, Safety, Security and the Environment (HSSE)

**Demonstrate how Health, Safety, Security and the Environment (HSSE) have been integrated into the design and operation of the proposed development including management systems (e.g. policies, plans and procedures including as they relate to workforce and contractor management).** Given HSSE applies to all aspects of a development and the integrated nature of the FDP it is possible that particular areas of this section may be cross-referenced if addressed in previous sections. The operator must demonstrate that appropriate measures (people, plant and processes) are in place to adequately: i) safeguard the workforce and public health and safety; ii) protect the environment and demonstrate that risks over the

project life are as low as reasonably practical (ALARP). The following areas should be covered:

### 6.1 HSSE philosophy, goals and objectives

Provide an overview of the HSSE philosophy, strategy, goals, performance standards and risk acceptance criteria.

### 6.2 Health

Overview of measures taken to safeguard the health of the workforce and the public including key sources of risk (e.g. noise, pollution, radiation etc.), how risks are minimized and managed such as air-quality control, portable water systems, health-service plans, health and medical facilities. [To be reviewed for compliance with national occupational, health and safety laws and regulations]

### 6.3 Safety

Explain how safety has been integrated into the design and operation of the proposed development in line with international best practice including:

- Safety management philosophy, processes and the safety management plan for the proposed development (may be covered under section 6.1)
- Summary of the hazard assessment (HAZOP) study. It is recommended that results of HAZID (hazard identification) study conducted during the conceptual design phase are furnished when available. HAZOP studies are to be provided as a separate attachment.
- An overview of standards and specifications that will apply to the development e.g. safety, buffer and exclusion zones around facilities/installations
- Overview of safety-related facilities and equipment
- Inspection, monitoring and management plan for the safety and integrity of wells, platforms, pipelines, and other installations.
- Waste management plan. Describe methods and location for collecting, storing, treating, transporting, and finally disposing of all appropriate residues and emissions (i.e. solid wastes, liquid effluents, gaseous and particulate emissions)
- Emergency response and contingency plans. Types of emergencies for which contingency plans will be established; the proposed emergency response organization, chain of command and key areas of responsibility; the training of personnel and response exercises; the estimated response time for major classes of emergencies; and planned participation in initiatives to improve response capability. Details of oil-spill contingency plans are to be provided and consistent with national and regional management. Where hydrogen sulphide (H<sub>2</sub>S) is present, a separate contingency plan is to be provided.

## 6.4 Security

Security management plans including any cyber security vulnerabilities and strategies.

## 6.5 Environment

### **Explanatory Notes:**

Requirements and timing for Environmental Impact Assessment (EIA), also referred to as Environmental and Social Impact Assessment (ESIA), will depend on the country's legal framework. EIAs can take several months for the operator to prepare and similarly, given their complexity, can also take several months for the Government to review and approve. In some countries, an EIA is part of the FDP submission, in others it is required before the FDP is submitted. It is therefore critical that both the operator and relevant Government agencies incorporate sufficient time for preparation and review of the EIA as it is a criterion for FDP approval.

Environmental impacts and measures to minimise, manage and mitigate them, should be discussed both in qualitative and quantitative terms for all phases of the project, consistent with the Environmental Impact Assessment (EIA) which should be attached separately. Provide a summary of the findings from the EIA, including:

- Describe environmental factors relating to the facility emissions, storage, and discharges
- Overview of environmental management plan covering water and sewer-treatment systems, effluent-handling system (catchment, containment, treatment and discharge) of the storage facilities for chemicals and fuel.

## 6.6 Greenhouse gas (GHG) emissions and climate uncertainties

### Explanatory Notes:

Countries have made international commitments under the Paris Agreement via Nationally Determined Contributions (NDCs). NDCs will be updated every 5 years with the expectation of more ambitious commitments in subsequent years - a ratchet mechanism. The petroleum sector is one of the largest sources of GHGs and it is therefore critical that FDPs should be consistent with national plans and strategies for low-carbon development and transition of the energy sector. Collecting projects' GHG data will help inform and shape national policies e.g. appropriately reflecting future NDC commitments. Please note that the ministries/agencies responsible for national accounting and reporting of GHG and development of NDCs should be consulted to ensure a coherent approach to the development of national GHG inventories.

Adopting a Net Zero approach as a criterion for FDP approval could support adaptation and mitigation efforts in country. Countries facing challenges in climate financing should explore the potential of requiring emissions to be offset through national climate mitigation projects e.g. mangrove restoration or decentralized rural electrification from renewable energy sources. This would be consistent with several companies' stated targets, could provide a source of climate financing and would also create ripple effects on employment and economic benefits.

In addition, the project's GHG profile is important to understand the implications of developments in the carbon space e.g. carbon pricing, carbon border-tax adjustments, emissions trading and offsetting mechanisms. This includes the risk to government revenues from the project which tend to be back-end loaded and hence will be disproportionately impacted by carbon risks including stranded assets, loss of markets, curtailed production, extreme weather events.

Overall, given the growing carbon risks, the value to the country may be significantly lower than expected. Operators should thus demonstrate how the project design minimises GHG emissions and is robust to growing impacts from climate change.

**This section should provide an overview of the measures to quantify, monitor and minimise GHG emissions over the project's lifecycle and how resilient the project is to climate uncertainties.**

- 1) Discuss any vulnerabilities to potential climate change impacts and how they have been factored into the design and operations of the project e.g. placement

and design of facilities/infrastructure, water usage minimised (droughts, limit use of freshwater draws, recycling), climatic events included in HSE systems (e.g. hurricanes, floods).

## 2) GHG strategy and management plan

- Estimated life-cycle GHG emissions for the project in accordance with the GHG Protocol. At a minimum, scope 1 and 2 are to be provided (direct and indirect emissions). Depending on the nature of the FDP, scope 3 emissions may also be required. *[Provide guidance on the methodology for reporting which should be aligned with national accounting and reporting requirements.]*
- Overview of project design and processes for minimising, measuring, monitoring and reporting GHG emissions and, in particular, provide an account for:
  - Ensuring zero routine flaring and venting. Also include specifics on equipment for measuring emissions from flaring and venting.
  - Measures to ensure energy efficient operations e.g. energy-efficient equipment, electric vs diesel engines, transportation
  - Leak detection and repair (LDAR) program for methane and other fugitive emissions including use of AI/technology remote surveillance
  - Use of renewable energy in operations
  - Potential for CCUS and/or hydrogen
- Outline phased plan for becoming Net Zero on scope 1 and 2 emissions with particular emphasis on offsets that can be delivered by potential in-country projects.

## 3) Sensitivity analysis of project economics to carbon price/tariffs. Evaluate project value and government revenue flows under various carbon pricing scenarios.

## 7. Decommissioning

### Explanatory Notes:

Decommissioning is the inevitable end of all oil and gas projects and Governments run the risk of being left with the financial, environment and social costs of decommissioning activities if appropriate plans are not put in place. Regulators should thus ensure that decommissioning is adequately addressed from the start of a development. In instances where the legal requirements are silent or weak, it is better for the Operator and Government to resolve treatment. It is critical to ensure that the project is

designed with “the end in mind” and there is adequate financial assurance that decommissioning costs will be fully met by the owners.

A preliminary Decommissioning Plan should be submitted as part of the FDP. Naturally this would be a high-level initial view which will be refined over the project lifecycle.

An overview of the decommissioning plan for the development including assumptions for plugging and abandonment of wells, all associated infrastructure and measures that would have to be taken to leave the site in an environmentally sound state and for alternative uses (e.g. offshore: fishing, navigation, onshore: agriculture, local community use). Description should include at a minimum;

1. Provisions and steps included in the design and operations to facilitate decommissioning should be identified. e.g. drilling mud, drill cuttings treatment, re-use or Disposal of Facilities. Discuss any options identified for potential re-utilization of the facility and disposal solutions which may have an impact on the selection of materials and technical solutions.
2. Estimated year of cessation of production and timing of decommissioning activities. Please note all decommissioning activities are to be completed within the tenure of the governing petroleum agreement or licence.
3. A brief description of the decommissioning strategy/activities. i.e. how each component of the project will be dealt with (pipelines, tubing etc.)

*Please note: The operator should assume plugging and abandonment of wells upon cessation of production and the complete removal of all infrastructure. This is consistent with international obligations, primarily under the United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) and associated Protocol. Recognising there may be project variables and/or site-specific environmental and safety risks that may affect the timing and removal of installations, the Operator may propose alternative treatment. Such proposals would have to demonstrate that the alternative decommissioning approach delivers equal or better environmental, safety and well integrity outcomes compared to complete removal, a plan for collecting project specific information over its life-cycle to support the proposal and that the approach complies with all national laws and international commitments.*

4. Preliminary decommissioning costs and basis for estimates
5. Financial assurance mechanism to ensure that decommissioning liability will be fully funded.

## 8. Social and Economic Impacts

### Explanatory Notes:

Any approved FDP should demonstrate that there are economic benefits that will accrue to the country and the social implications are effectively being addressed. The Operator's submission should clearly explain how the project is expected to contribute to the local communities and the economy as well as the associated risks. The Government should seek to clearly establish key targets for the development where appropriate which would subsequently be managed over the life of the asset as part of the ongoing regulatory oversight.

It is important that the various government agencies are involved in tailoring this section to the national context. This will help ensure consistency, streamlining of information to be provided (benefit of reducing the administrative burden to the Operator and ensuring different Government agencies will receive all relevant information in a timely manner).

**This section is to explain how the project will contribute to the sustainable development of the country by providing and overview of the social and economic impacts and the risks thereto.** At a minimum it should contain an overview of Local Content, Social Impacts and Project Economics which are described later in this report. The Operator should provide additional information on other matters depending on the complexity of the development upon consultation with the Regulator.

### 8.1 Local content

#### Explanatory Notes:

In many countries, there are specific Local Content (LC) provisions contained either in law or in the governing Petroleum Agreement. The FDP is a key regulatory tool for Governments to enforce compliance with these requirements.

In tailoring this section to the national regulatory framework, care should be taken to ensure that the commitments made in the FDP can be tracked and monitored on an annual basis. The Government should develop standard reporting LC templates and clear guidance on definitions which can subsequently be used to monitor and evaluate progress against the Local Content Plan for the development.

Illustrative text is used below for the key LC areas – i.e. employment, procurement of goods and services and transfer of knowledge and technology – which should be replaced with country specific content to align with regulatory requirements.

An overview of the operator’s local content strategy over the full life cycle of the project as it relates to...

- Maximising employment and development of [insert nationality] including targeted metrics for measuring progress;
  - The expected size and composition of the workforce by discipline and location
- Maximising the participation of local suppliers along the value chain.
  - the procurement and contracting strategy [including tender evaluation methodology and vendor selection]
  - Targeted metrics for measuring progress.
- Encouraging the transfer of technology, knowledge and skills including research and development programmes
- Demonstrate how similar measures and performance metrics will be instituted for subcontractors

## 8.2 Social impacts

### Explanatory Notes:

Social Impact Assessment (SIAs) are often embedded into Environmental Impact assessment (EIA) requirements. In some jurisdictions, the term ESIs are used to reflect the dual nature of the assessments. Regardless of the nomenclature, SIAs should be conducted for a development to ensure that the implications from the development are understood and effectively managed. This is of growing importance as without the “Social License to Operate” a number of projects have been stopped or delayed. The Government should provide clear guidance on SIA requirements to operators.

A separate Social Impact Assessment (SIA) should be included as an attachment to the submission. This section should provide a brief summary of the SIA including:

- How the SIA was conducted
- The stakeholder groups that will be impacted by the project and a stakeholder engagement plan including how consultations will be conducted
- The duration and extent of positive and negative social impacts. For example, displacement of communities, influx of migrants, people’s way of life and culture.
- Strategies and actions for preventing, or managing those impacts, as well as how the progress will be monitored. A Resettlement Action Plan is to be included, where relevant.
- Analysis and strategies for managing the impacts on women, vulnerable groups and Indigenous Peoples

### 8.3 Project economics

#### **Explanatory Notes:**

Given the high degree of uncertainty that can impact project economics, it is critical that the government has a clear appreciation of how government revenues will be impacted by changes in key areas of uncertainty e.g. pricing, production, costs. Ideally the government should have independent economic models and experts to conduct independent evaluation of the feasibility of a project and the returns to the country. The government should establish what key metrics should be provided and the discount rate to enable comparisons across various projects in the country.

Please note that economic analysis is to be provided in the other sections to underpin decisions made in areas such as area development strategy and preferred concept selection. All economic analysis is to be performed on a consistent basis in order to ascertain pre-tax project viability as well as the potential returns to the investors and the state. At a minimum the following metrics should be provided: Net Present Value, Internal Rate of Return (IRR), discounted payback period, break-even price, government take (ratio of government NPV from total pre-tax NPV). Government indicators should be provided at a granular level for understanding of the value derived from various elements e.g. royalty, taxes, state participation.

This section is to provide an understanding of the economic viability of the proposed project, how robust it is to changes in key project parameters and how benefits will be shared between the government and the companies under a range of potential outcomes. All relevant aspects of the project and quantification of key uncertainties should be included. The following particulars must be provided:

- 1) Basis and methodology for economic analysis. Project economics for the proposed development are to be presented on pre-tax and post-tax basis using a [10]% discount rate and for three scenarios (base, low and high). The base case should be on P50 estimates of resources, costs etc. [Please note different companies will use different discount rates and this can significantly impact project economics and hence the assessment of value to the company as well as the government. The use of a standard discount rate will enable comparison across multiple projects and companies. It does not mean that a company's investment decisions will be based on this specified rate. The standardised discount rate for FDP economics should be established in consultation with Ministry of Finance.].
- 2) Any factors which are critical to commercial viability and how they will be managed. For example:

- Marketing and sales arrangements for products (crude oil, gas, condensate, NGLs etc.). Provide evidence of efforts made to obtain contracts for the sale of products, including any information on approaches by third parties, engagements with potential buyers.
  - Project financing. Details on the source of funding over development and production including debt-to-equity ratio and , borrowing costs.
  - An account should be provided of future commercial opportunities that may provide a basis for changes in the investment scope.
- 3) Economic analysis assumptions made in generating the project's net cash flows:
- Annual production profile by hydrocarbon type and sales volumes by product (e.g. oil, gas, condensate, NGLs)
  - Annual and total cost estimates – capital expenditure (capex), operating expenditure (opex) and decommissioning costs accompanied by a description of the methodology, assumptions, and basis for the cost estimates. Benchmarking of costs to similar projects should be provided. Each cost profile should be provided at a granular level for each major component. *[It is recommended that the regulator should request information in a form that is consistent with fiscal regime and contract/licence management e.g. Annual work plan and budget format (it should be noted that the level of detail at FDP if submitted at select stage will not be as granular as annual budgeting or taxation purposes. However, the categories should be provided for ease of monitoring and understanding performance.)]*
  - Pricing and sales assumptions. Gas contracts should be documented and should include base price, escalation factors, lag period, base values for escalation factors and the contract duration.
  - Information on tariffs and tariffing arrangements including total annual fixed and variable costs (for use of facilities or pipelines etc.) and basis for tariff calculations (e.g. base cost per barrel, escalation factors and escalation lags).
  - All other assumptions such as exchange rates, inflation, project financing.
- [Please note: It is recommended that standard templates are used for the operator to submit the underlying assumptions where appropriate e.g. production, costs, sales.]*
- 4) Base Case Project economics and sensitivity analysis. The base case is expected to be based on P50 estimates of resources, costs etc. Key project uncertainties such as sales prices, carbon pricing, costs, resource base and schedule delays are to be quantified and economic outcomes provided. Provide summary metrics in tabular format and in tornado charts.

- 5) Scenario analysis. A minimum of two cases are expected for the preferred development solution and are to be consistent with P10 and P90 estimates for production, costs as outlined within the FDP submission. Depending on the particulars of the FDP, additional scenarios may be required.

## **9. Project Schedule, Planning and Execution**

**Provide an overview of the project schedule, critical-path activities and measures that will be employed to effectively manage risks and ensure delivery of the project on time and within budget.** This section should:

- Provide a description of the project management system
- Describe how the competence and compliance of all personnel involved, including contractors, will be assessed and monitored
- Outline the procurement and contracting strategy with a focus on long-lead items
- Include a list and of all necessary permits required and evidence of compliance where applicable
- Provide an integrated project schedule to production including key events and critical milestones (e.g. consultations from the stakeholder engagement plan), and cost estimates

## **10. Risk Management**

**Provide an overview of the project's key uncertainties (upsides and downsides) and strategies for managing. An overall project risk register detailing key risks and opportunities along with risk management and mitigation plans should be kept.**

- Outline knowledge transfer and learnings. Lessons learnt at company and industry level should be presented, including how performance will be monitored and lessons captured across project implementation.
- Include a separate detailed project execution plan (PEP)
- Include a separate commissioning plan (to be submitted as the project develops)

## Section 3: Contents for Revision of an Approved FDP

### **Explanatory Notes:**

It is possible that the operator may seek approval to amend the approved FDP in light of new information or material changes in one of the many sources of uncertainty that can effect petroleum projects. To facilitate efficient processing of such requests, it is important for the government to provide clarity to the operator on the information that will be required to assess the acceptability of those changes.

The government does not anticipate that FDP revisions will be required routinely, and operators are encouraged to consult with the regulator as early as possible prior to preparing a revised FDP.

The government recognises that each project is different and depending on its nature and complexity, some subsections may not be applicable or, conversely, more information may be required. The operator should consult with the regulator on the specifics of a submission to ensure all documentation is provided in a timely manner.

- Executive summary: project performance to date, reasons for requesting revision to the FDP, proposed changes and implications. A comparison of economic metrics, with and without the changes, are to be presented. Details on government revenues by each source are also to be presented.
- Review of performance of the project relative to the FDP submission on the key section headings i.e. Field Description, Development Plan, Operations and Maintenance, HSE, Decommissioning, Social and Economic Impacts, Project Schedule, Planning and Execution.
- Details of the proposed changes. Results of studies or assessments should be attached with the submission.
- Implications on the FDP by relevant section headings i.e. Field Description, Development Plan, Operations and Maintenance, HSE, Decommissioning, Social and Economic Impacts, Project Schedule, Planning and Execution.

A material change includes, but is not limited to:

- Change to the development strategy or management strategy of a field or pool
- Changes to the plan for development of additional pools in the field
- Cessation of production, permanently or for the long term, before the date proposed in the FDP
- Introduction of new methods for petroleum recovery, such as enhanced recovery and injection of fluids