

Gas
Transmission

Cost Assessment Working Group

20th November 2018

nationalgrid



Contents page

01	Cost drivers	03
02	Reporting principles	12
03	Investment planning	21
04	Flexibility	25
05	Cost assessment	27
06	Cost benefit analysis	32

Gas
Transmission

01

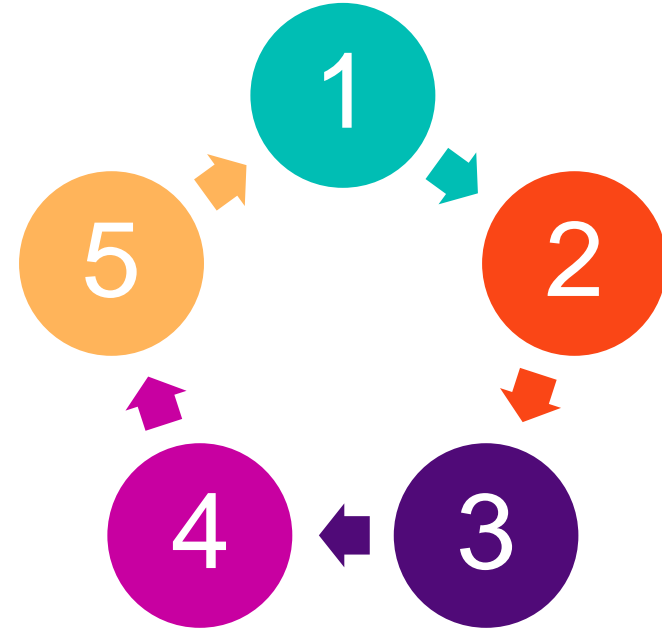
Cost drivers

nationalgrid



Maturing methodology to Unit Cost lifecycle

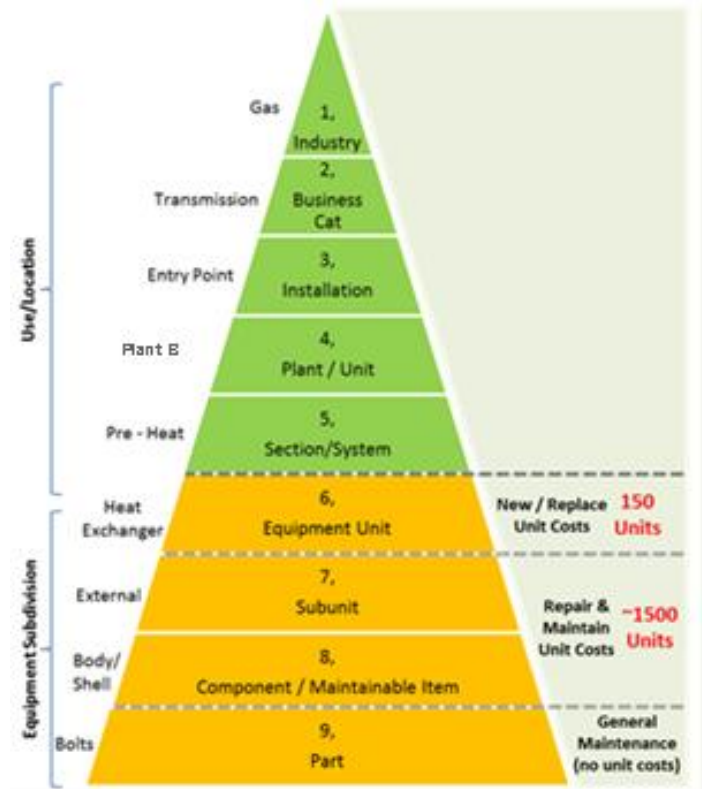
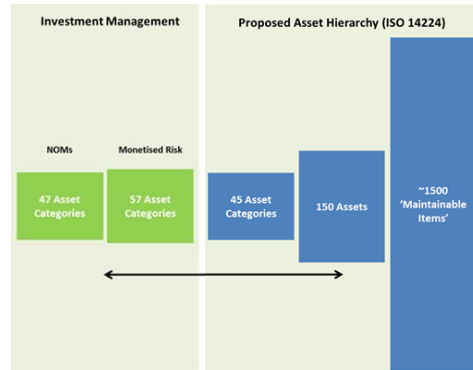
1. Enhanced unit costs to be used to estimate the indicative project cost at investment case
2. Following investment case approval, contract tenders to be returned split by asset units
3. Invoiced costs gathered by asset unit throughout project delivery
4. Outturn unit cost analysed at project closure
5. Unit costs to be used for forecasting and estimating controlled and updated periodically within each year



The new unit cost process, structure, and supporting data capture methods are in development as part of our GT change programme

Asset Categorisation for Unit Cost

- Cost Units are being aligned to ISO14224 (petroleum, petrochemical and natural gas industries – Collecting and exchange of reliability and maintenance data for equipment)
- Mapping of Units of cost to 47 Secondary Asset Groups



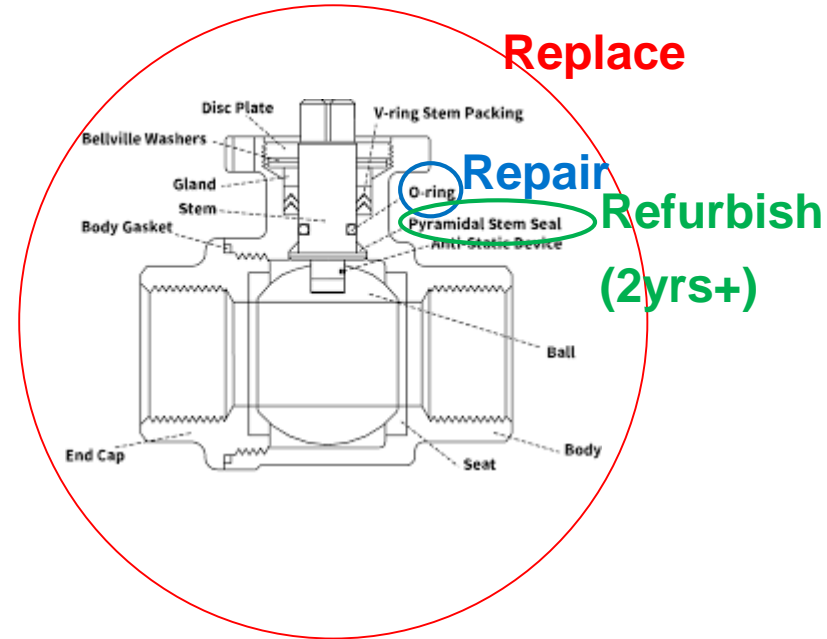
Secondary Asset Groupings

- Reporting cost and outputs currently requires knowledgeable manual intervention, this is classified high risk for Data Assurance Guidance (DAG) and reduces our DAG scoring for the Regulatory Reporting Pack (RRP)
 - The 47 Secondary Asset Groupings are different to International Standards and are a mismatch of:
 - Systems
 - Sub-systems
 - Processes
 - Assets
 - Components
- We will be proposing reporting categories aligned to the new asset cost unit structure therefore giving the ability to produce RRP by automation from our systems, giving benefits of:
 - Lowering DAG scores in RRP showing reduced risk in reporting costs and outputs
 - Simplified asset structure and industry consistent language
 - Less time manipulating data to join together activities, asset volumes, and costs

What is included in the Unit Cost

- A cost for an Asset will be broken down to the relevant interventions: Cost to Replace the whole asset; the Cost to Repair/ Refurbish; and the cost to Maintain subcomponents of the Unit
- Clear definition will be provided of what is included in the Cost of the asset

All indirect costs will be attributed to assets via business rules on Project Closure



Key Cost Drivers

- Different asset classes have different cost drivers, including but not limited to:
 - Intervention (repair, refurbish, replace)
 - Size and output
 - Diameter
 - Site location / terrain
 - Ground conditions / soil types
 - Construction methods
 - Age of site
 - Obsolescence – replacing single assets in obsolete systems
 - Engineering discipline e.g. Electrical, Mechanical, Safety & Control, Civil
- Other drivers include reliability, and legislation for safety and environment

Example cost driver variances by installation

25 Compressor sites

- Every site has different network and customer requirements by location
- Designs and layouts of our 25 sites are different by requirements
- Industrial Control Systems, electrical systems, and communications are complex
- There are different volumes of assets in each grouping by requirements

~180 Above Ground Installation sites (including Block Valve sites)

- Every site has different network and customer requirements by location
- Different diameter pipes and different numbers of feeders connected therefore differences in numbers of valves and connecting pipework to change flows of gas. Mixture of exposed vs buried equipment.
- Many sites are remote (in fields without roads) making for difficult access by construction equipment

>7600km Pipelines

- Larger diameter pipes (up to 48" / 1.2m wide) for the highest flows and operating pressures lead to larger construction equipment and longer time for work on assets
- Pipelines can be 1m to 6m underground with holes to uncover the pipe becoming large open excavations with structures in place to prevent collapse of the side walls
- Terrain and ground conditions can make getting construction equipment to the location costly

System Operator key cost drivers

People capability

- We will need to evolve the capability of our people throughout RIIO-2. We have a broad mix of roles some of which require extensive training and/or experience. The need to both retain these skills, develop new skills and recruit when required will drive cost.

Systems

- The systems we utilise to operate the system and other vital tasks are complex and often bespoke. Cost to deliver new or maintain existing solutions will be largely driven by the complexity of the requirement and the external markets ability to provide the skills to deliver it.

The balance of people and system capabilities required to deliver what our stakeholders want is constantly changing and evolving, and will continue to do so as technology drives and enables changes to the way we deliver against our stakeholder priorities.

Business support key cost drivers

People capability

- Many of the necessary roles in business support functions require specific training, qualification and accreditation. They are also skills ubiquitous across all companies and so heavily affected by market forces.

Systems

- The systems we utilise to provide business support services will be based on industry standard platforms tailored to our needs. Cost to deliver new or maintain existing solutions will therefore be heavily driven by external market forces.

Gas
Transmission

02

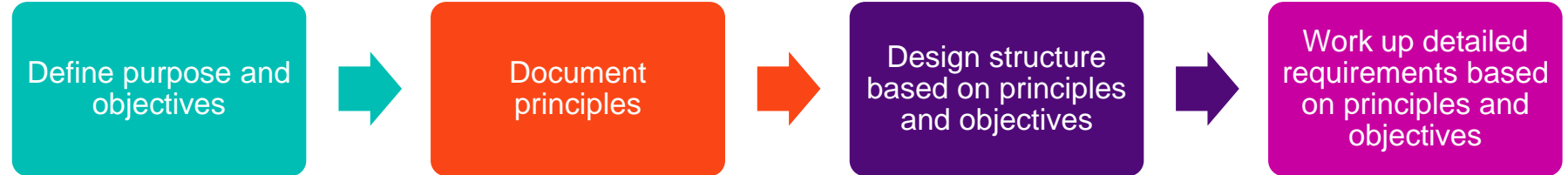
Reporting principles

nationalgrid



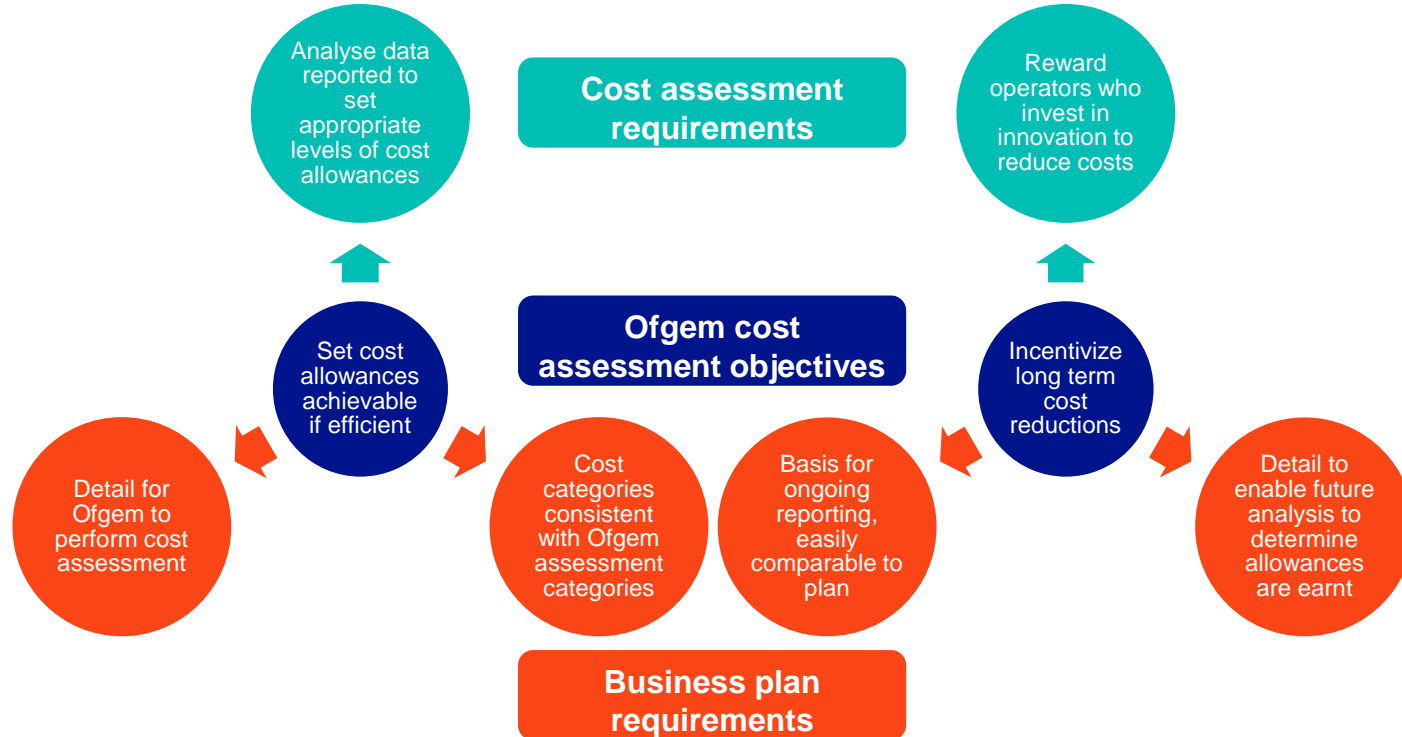
Process

To ensure we design fit for purpose reporting for business plans and ongoing T2 reporting we need to follow a process that starts with the purpose of the reporting and builds requirements with that purpose in mind:



Purpose and objectives — as presented by Ofgem at CAWG

Purpose of cost assessment and interaction with business plan requirements



Principles

Key Stakeholder Priorities

- We intend to tell the story of our business plan through the key stakeholder priorities, we believe it is right to continue that into reporting.
- Information useful to the user and has a clear purpose
- Baseline position with changes tracked

Costs and outputs together

- Costs should be reported closely with the outputs they deliver.
- Should not stifle the ability to innovate or balance the portfolio over time to deliver outputs
- Portfolio approach, outcome focused deal

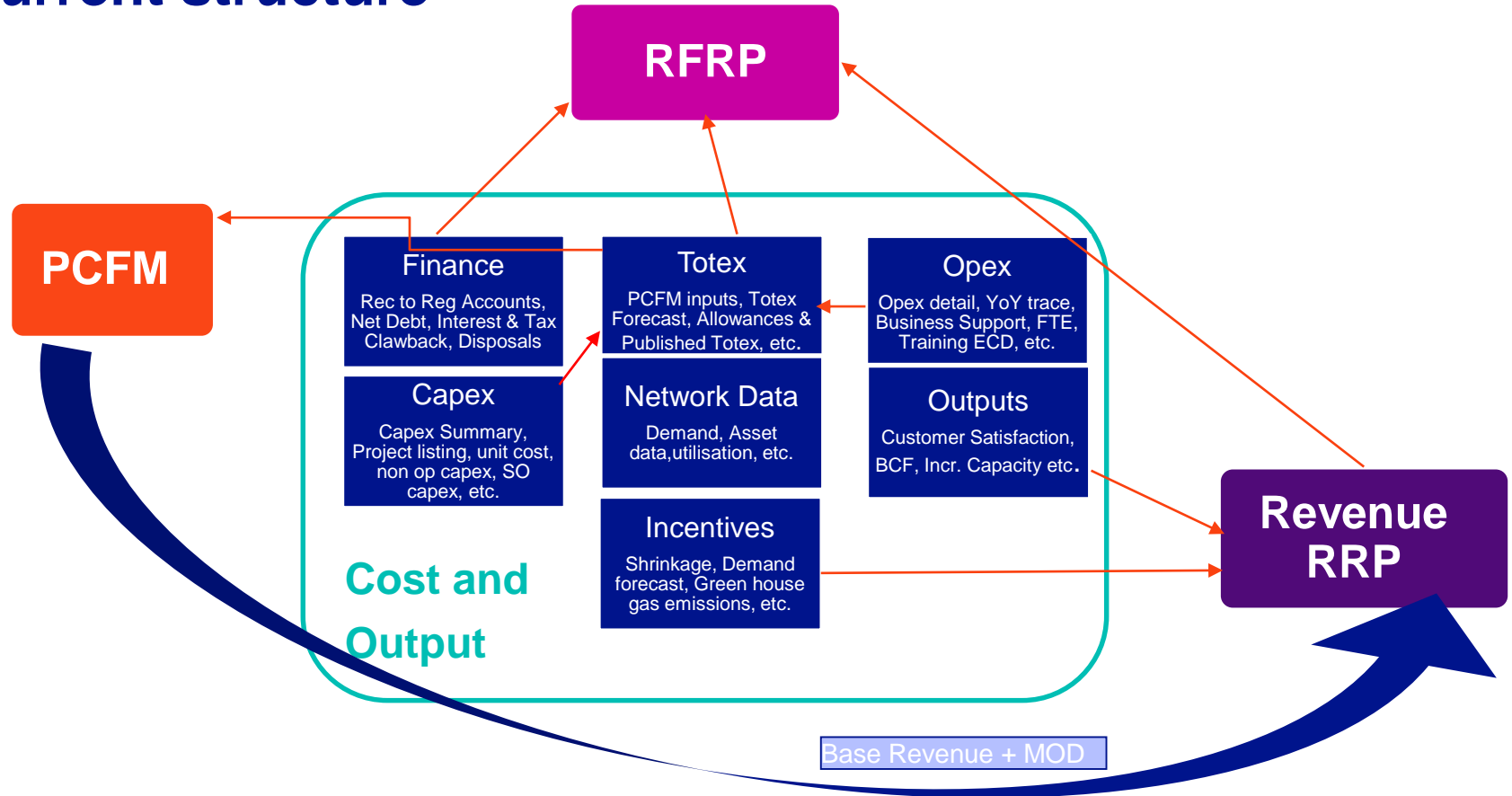
Transparency and simplicity

- Clear flow from why an output should be delivered to the cost to deliver
- Data used to run our business, avoid creation of data for reporting; close to system data and no assumption based allocation across categories
- Simple reporting with no duplication, information collected once

Project based reporting

- Projects are how most works is delivered and so reported.
- Focus on the right areas, de-minimus principle and materiality threshold for increased granularity of reporting per project.

Current structure



Our proposed principles

Simple, transparent, consistent reporting which gives the **right level of detail** to allow sufficient analysis while being easily understood. Coupled with meaningful narrative covering the **what, how and why** of performance.

Requirements

There is a need to fully understand how Ofgem will collect and analyse information to meet their objectives. Data requirements can only be properly scoped once this is understood. We have detailed some expected requirements below based on our understanding of Ofgem's use of data to fulfil their objectives:

Objective/use	Requirement
Assess efficiency effectively	High level tables with category by category reconciliation from plan to actual to give a greater understanding
Promotes efficiency and obtaining the best deal for consumers	Focusing on outcomes rather than inputs, tables which focus on each outcome and achievement of that with related costs and allowances. Reporting at an outcome level rather than an input level
Enable understanding of performance (what, how and why) including analysis techniques, avoiding further requests	Further work is needed to understand in detail Ofgem's methodology and requirements so we can design reporting with the right balance between detail, narrative focussing on understand and resource burden of producing reporting.
Allow for totex reporting and compatible with Ofgem T2 annual reporting	We agree that to make the process efficient compatible information is required, if details of the requirements were shared we can ensure the data is in the required format

Proposed future structure (data focused)

Simplicity and close or linear flow of data inputs can promote transparency of cause and effect from output delivery through to revenue impact.



Next steps

- **Agree and document principles**
- **Design structure based on principles and objectives – consult**
- **Develop and agree specific requirements recognising principles and objectives**
- **Develop detail in an evolutionary manner from existing tables to align with new structure and deliver requirements**

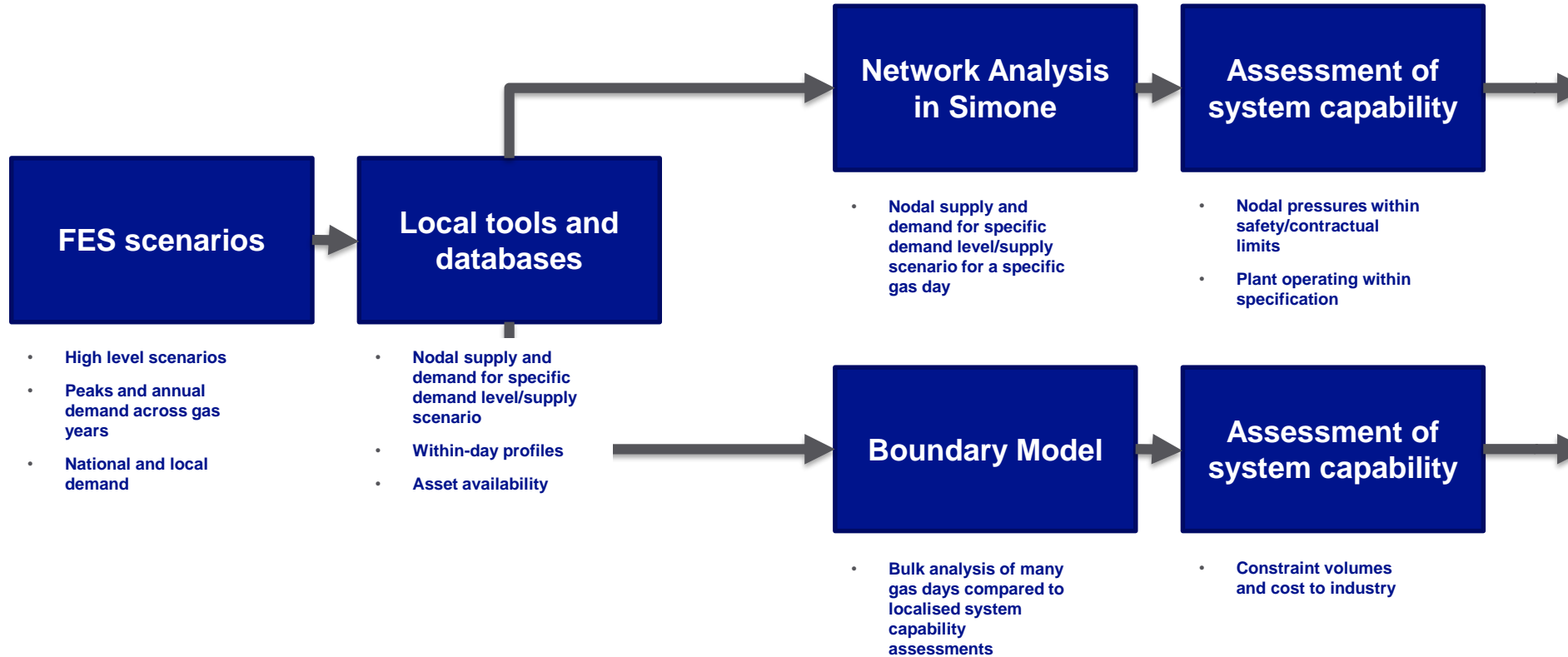
Gas System
Operator

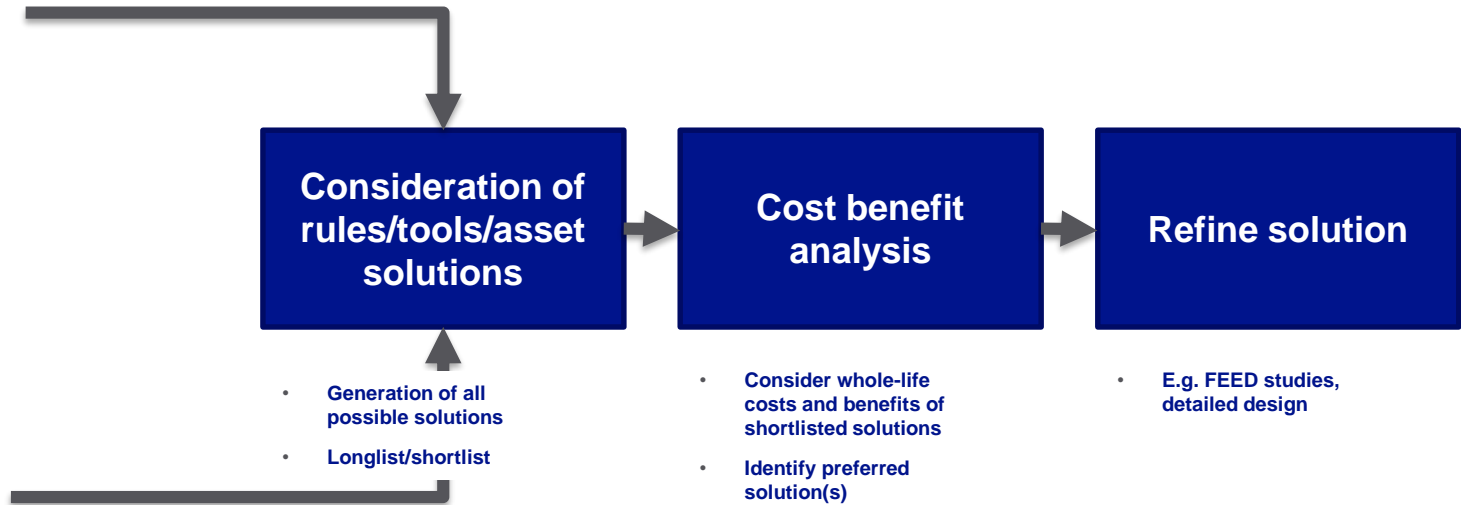
03

Investment
planning

nationalgrid







Gas System
Operator

04

Flexibility

nationalgrid



Flexibility

- Flexibility is a component of the capability of the network.
- We are looking to define Flexibility as part of our T2 work defining the capability of the network.
- Based on operational observation and feedback we believe flexibility to be of value to connected customers for the benefit of energy consumers.
- Any deviation from a flat flow rate at any point during the balancing day (05:00 – 04:59).
- Where, as a result of external signals, parties may need to change their within day profile and the ability of the network to accommodate this.

Gas
Transmission

05

Cost
assessment

nationalgrid



Cost assessment

Cost assessment techniques

Resource Intensity		Direct Opex	Indirect Opex	Load Related Capex	Non-Load Related Capex
Lighter Touch	TOTEX Benchmarking	✓			
	Disaggregated Benchmarking	✓	✓	x	✓
	Historical Trend Analysis	✓	✓	✓	✓
	Unit Quantity Analysis	✓	x	✓	✓
	Asset Unit Cost Analysis	✓	x	✓	✓
	Output Unit Cost Analysis	x	x	✓	x
More Detailed	Expert Review	?	?	?	?
	Project by Project Review	x	?	?	?

Cost assessment 1

Cost Area	Cost Category	Cost certainty (no consideration of volume)	Historic trend	Benchmark	Unit cost	Bespoke quote
Load related Capex	Entry	Potentially project specific				✓
	Exit					✓
	Flexibility				?	?
Non-load related Capex	Asset health	High at asset unit cost level.	✓	?	✓	
	Emission Reduction		✓		✓	?
	Physical Security		✓	✓	✓	
	Cyber security	Emerging.				?
	Decommissioning				?	?
Non operational Capex	IT	High based on historic trends.	✓			
	Buildings/Plant/Fixtures		✓			
	Vehicles		✓			

Cost assessment 2

Cost Area	Cost Category	Cost certainty (no consideration of volume)	Historic trend	Benchmark	Unit cost	Bespoke quote
TO Opex	Business support	High based on historic trends.	✓	✓		
	Closely associated indirects		✓			
	Faults		✓			
	Planned Inspections & Maintenance		✓			
	Other direct costs		✓			
	Quarry & Loss	Emerging.	?			
	Physical security	High at asset unit cost level.	✓	✓		
	Cyber security	Emerging				?

Cost assessment 3

Cost Area	Cost Category	Cost certainty (no consideration of volume)	Historic trend	Benchmark	Unit cost	Bespoke quote
SO Capex	IT	Emerging dependant on complexity of driver.				?
	Xoserve					?
	Cyber security					?
SO Opex	Business support	High based on historic trends.	✓	✓		
	Direct Opex		✓			?

Gas
Transmission

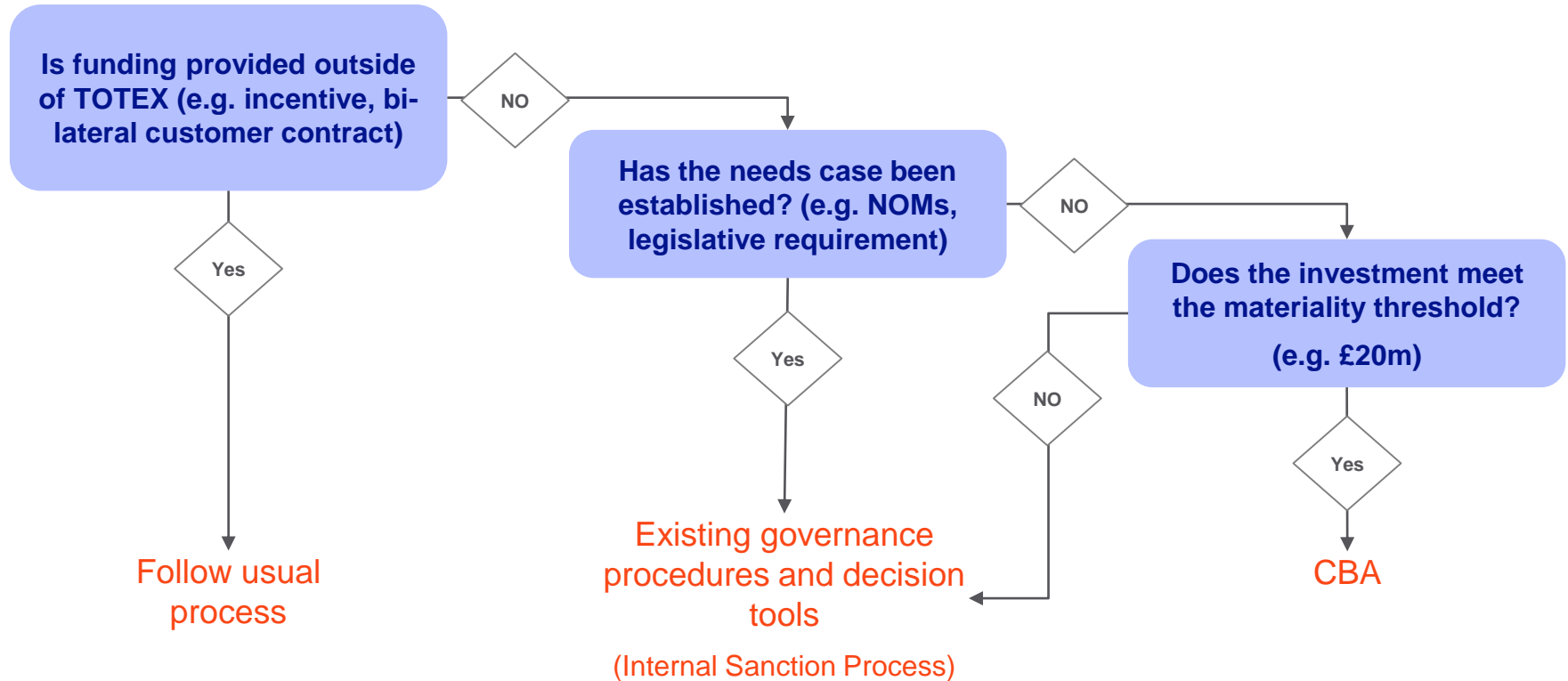
06

Cost benefit analysis

nationalgrid



Use of supplementary CBA in RIIO-2 Business Plans



nationalgrid