Introduction

Gas Networks Ireland

- Regulated Business

- Maturing Network

- CAPEX – Refurbishment and Network development

- ~€600m over 5 years interval

- ISO 55001 accredited business

- Next Regulatory phase commences in 2022

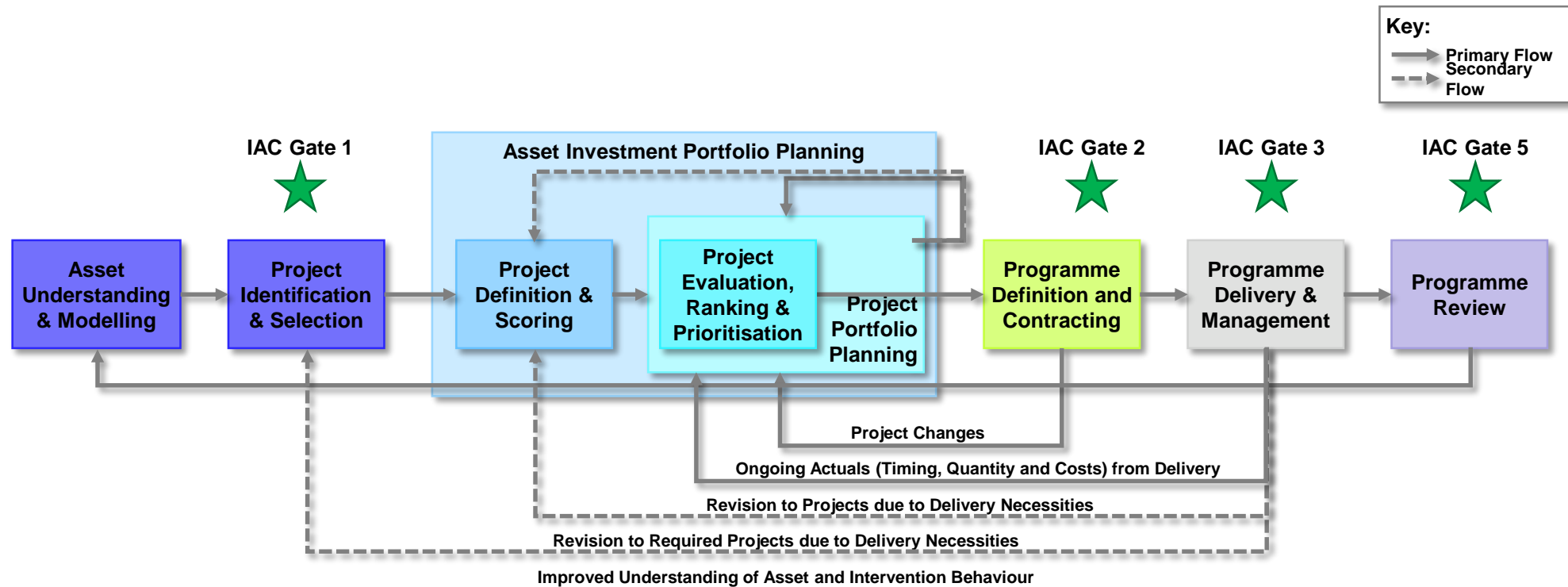# Presentation Overview

Journey

- Investment decision making development strategy.

- Where we landed and why.

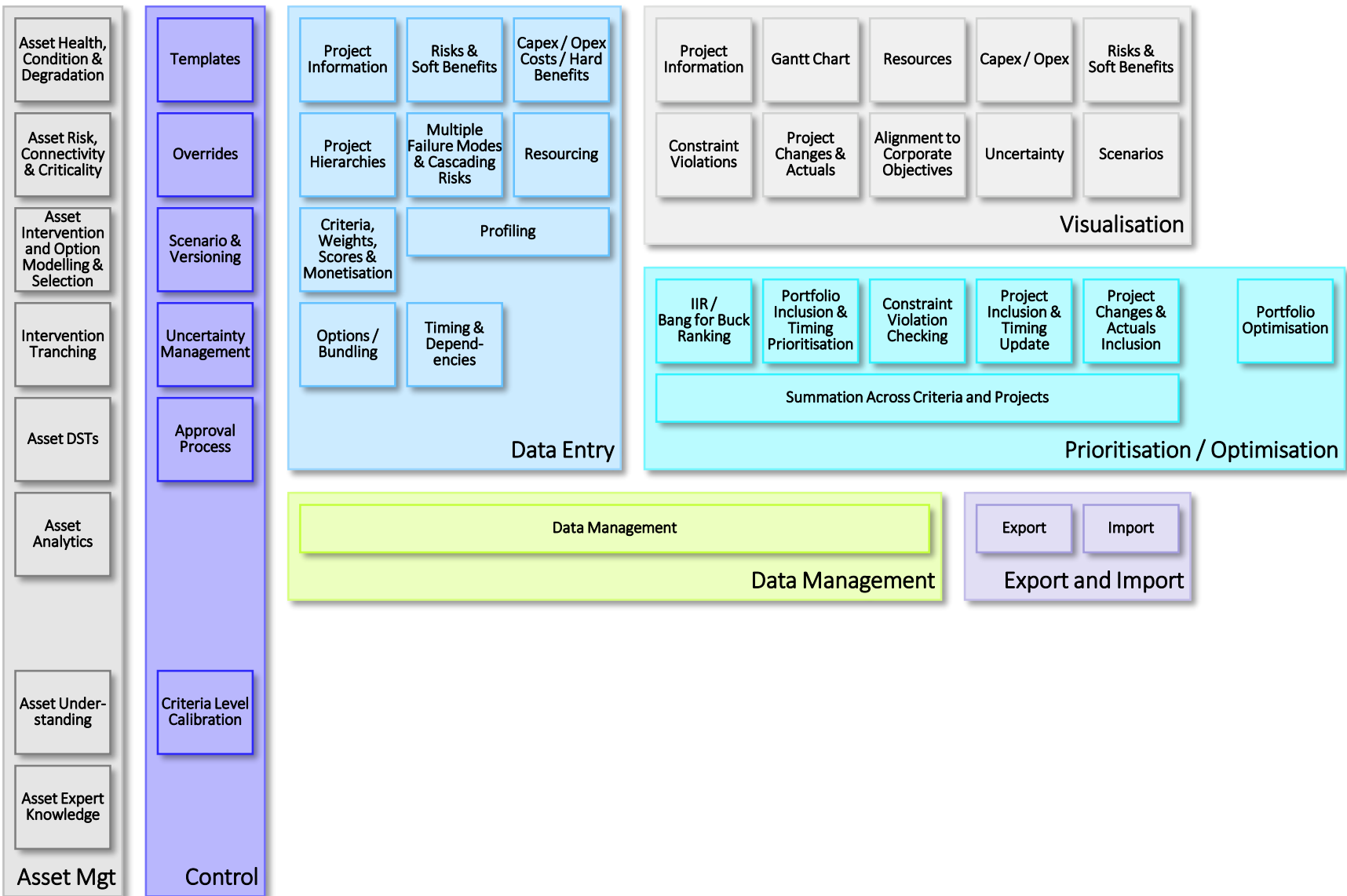- Future Development

Outcome (to date)

- Review of the application currently under development

Investment Decision Making at GNI

- As part of the Asset Management journey, GNI are moving from expert judgement to more quantative based investment decision support.

- In 2018 GNI initiated a process of determining the business solution scoping and implementation approach

- Completed analysis on:
  - Detailed understanding of the business requirements,
  - Current business data capabilities,
  - Process scope and organisational alignment.

- GNI reviewed the key market leaders currently available.

- Developed scenarios for the different solutions

- Timing was a key factor in the solution chosen due to impending regulatory price control.

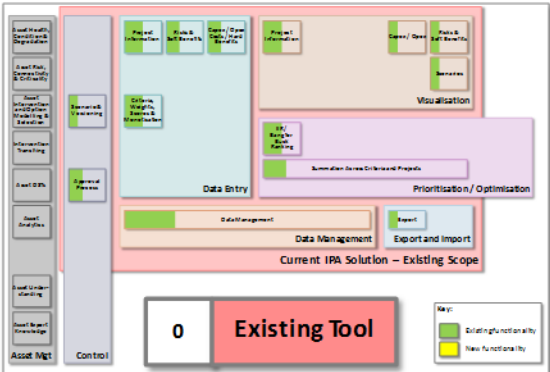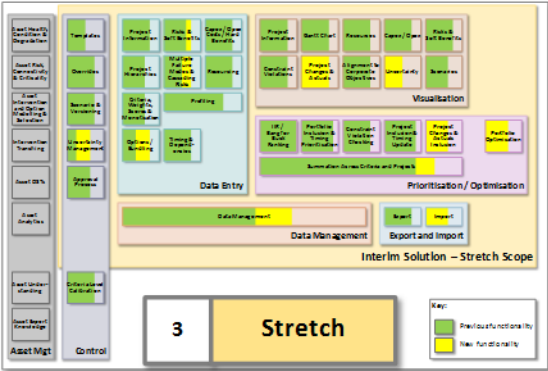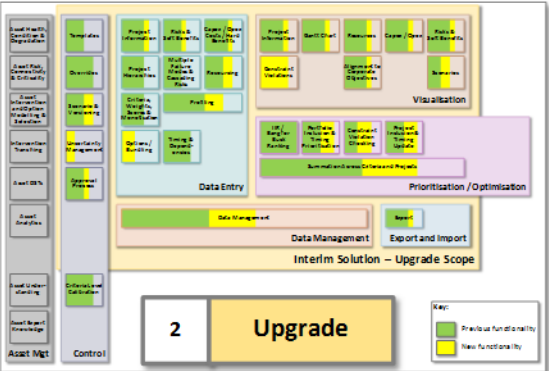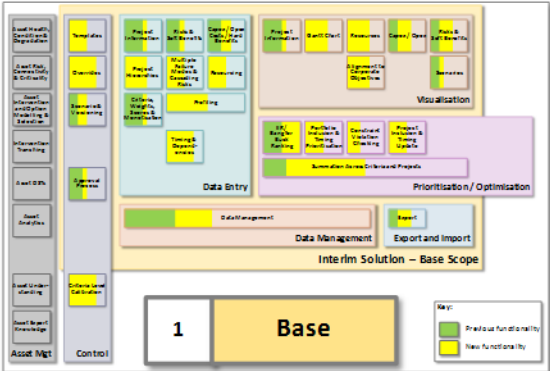# Gas Analysis and System Integration

Functionality Scope

Asset Mgt
- Asset Health, Condition & Degradation
- Asset Risk, Connectivity & Criticality
- Asset Intervention and Option Modelling & Selection
- Intervention Tranching
- Asset DSTs
- Asset Analytics
- Asset Under-standing
- Asset Expert Knowledge

Control
- Templates
- Overrides
- Scenario & Versioning
- Uncertainty Management
- Approval Process
- Criteria Level Calibration

Data Entry
- Project Information
- Risks & Soft Benefits
- Capex / Opex Costs / Hard Benefits
- Project Hierarchies
- Multiple Failure Modes & Cascading Risks
- Resourcing
- Criteria, Weights, Scores & Monetisation
- Profiling
- Options / Bundling
- Timing & Dependencies

Visualisation
- Project Information
- Gantt Chart
- Resources
- Capex / Opex
- Risks & Soft Benefits
- Constraint Violations
- Project Changes & Actuals
- Alignment to Corporate Objectives
- Uncertainty
- Scenarios

Prioritisation / Optimisation
- IIR / Bang for Buck Ranking
- Portfolio Inclusion & Timing Prioritisation
- Constraint Violation Checking
- Project Inclusion & Timing Update
- Project Changes & Actuals Inclusion
- Portfolio Optimisation
- Summation Across Criteria and Projects

Data Management
- Data Management

Export and Import
- Export
- Import

Scope of Delivery Phases

Where we are
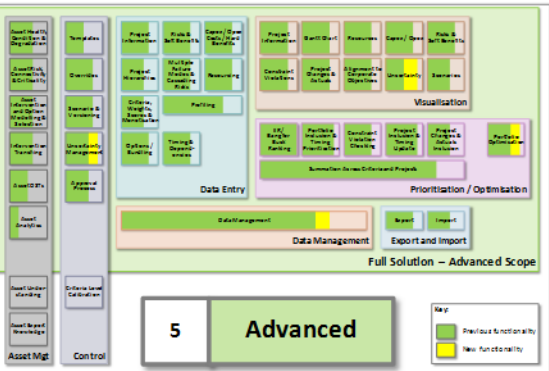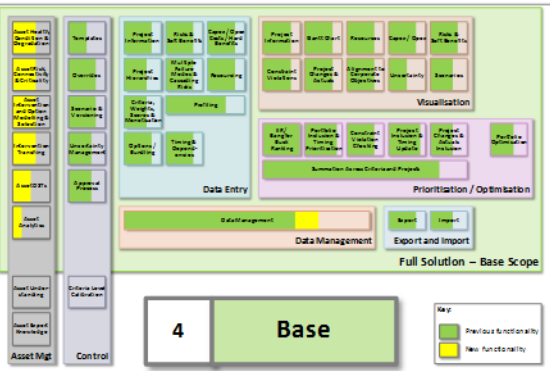
Where we want to go

Phased Implementation Approach

Investment Prioritisation Tool (current)	0	Existing Tool
Interim Solution	1	Base
	2	Upgrade
	3	Stretch
Full Solution	4	Base
	5	Advanced
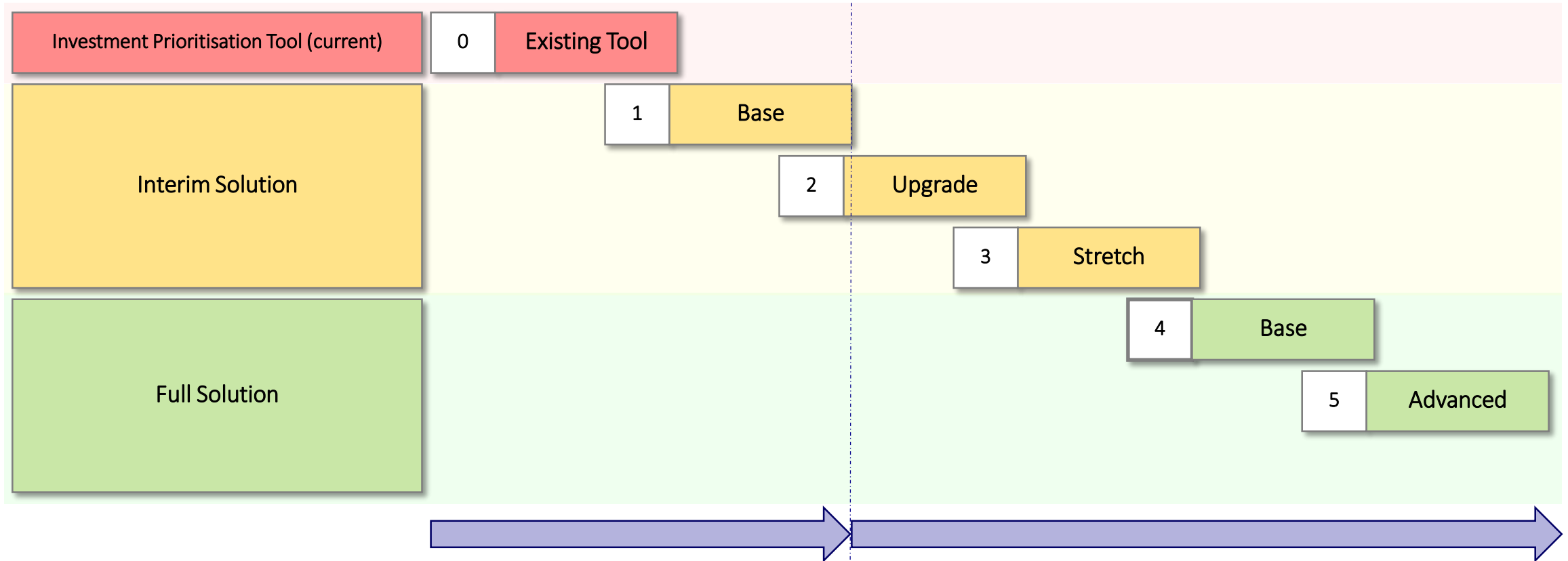
Phased implementation approach was best to achieve the goals of:
- Reducing implementation risk,
- Meeting the timing requirements of the business, and
- Moving business towards "full" implementation in future.

Phased Implementation Approach

- Additional delivery work is required in non-functionality areas

Governance

- Institutions
- Mechanisms
- Relationships
- Processes
- Monitoring

People

- Culture
- Skills
- Training
- Organisational design
- Roles

Process

- Business process
- Responsibilities
- KPIs

Analysis

- Tools
- Skills
- People

Data

- Availability
- Structure
- Definition
- Cleansing
- Capture

Technology

- Architecture
- Systems

Investment Prioritisation Application (IPA)

Investment Prioritisation Application (IPA)

Gas Networks Ireland

Phase 1 - Justification and prioritisation	Phase 2 - Delivery

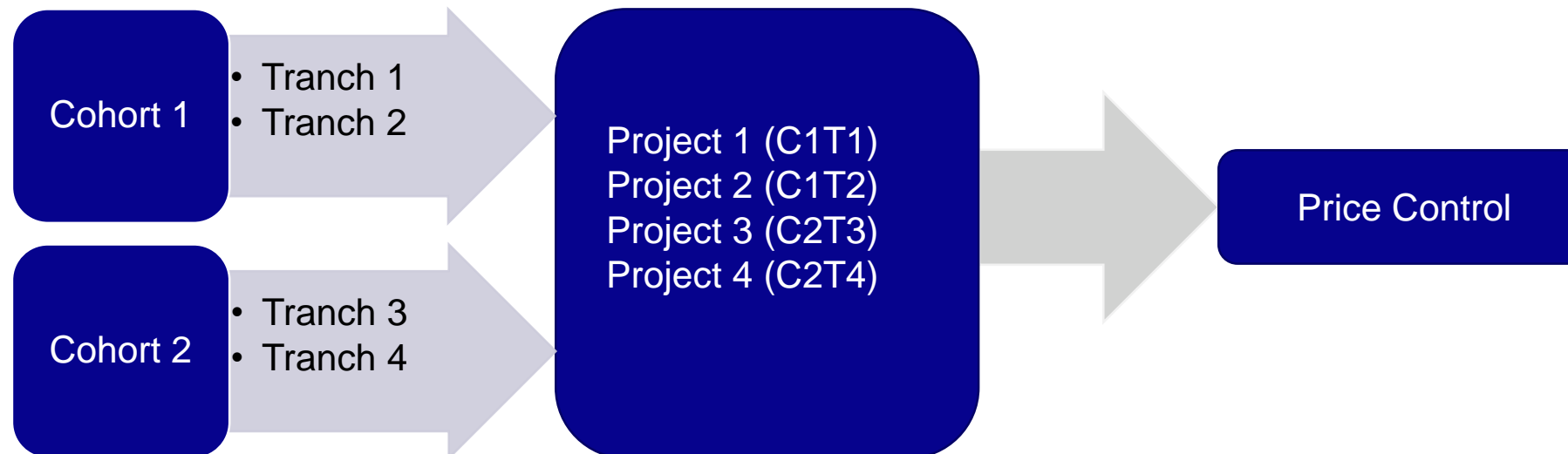## Phase 1 - Justification and prioritisation

- **Asset Condition**
  - Division of the asset base (investment portfolio) by type and condition
  - Development of asset condition curves.

- **Risk Analysis**
  - Analyse asset failures using Boolean logic in line with QRA type methodology
  - Converts asset failure into financial cost based on soft benefits

- **Cost/Benefit Analysis**
  - Using discounted cash flow analysis to determine the ranking and time of investment.

Phase 2 - Delivery

- **Portfolio analysis**
  - Review delivery constraints
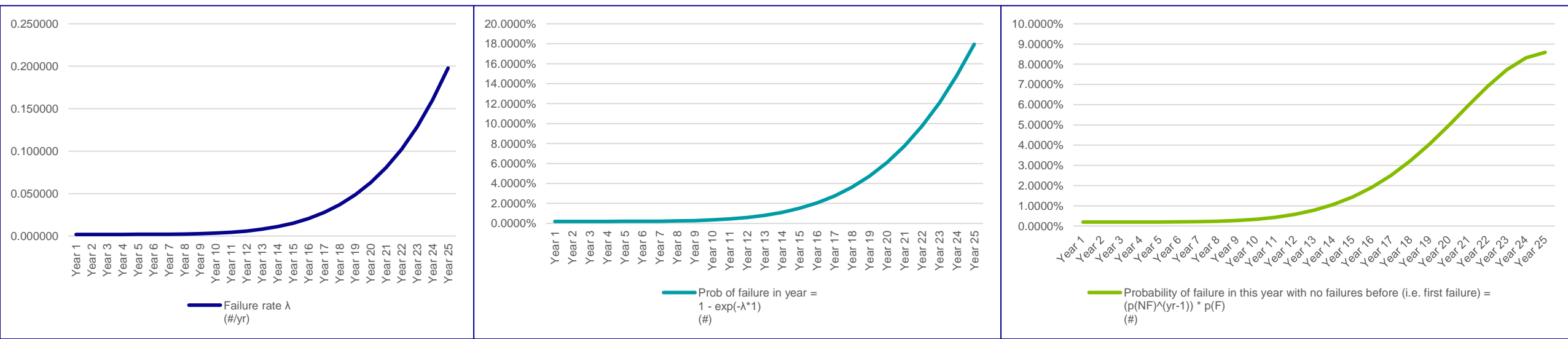 - Determine resource plan
  - Optimise delivery plan

Understanding the Asset Base

- Within the IPA, programmes will be divided into projects made up of Cohorts and Tranches.

- Cohorts - Assets by similar type.

- Tranches - Assets of similar condition within Cohorts.
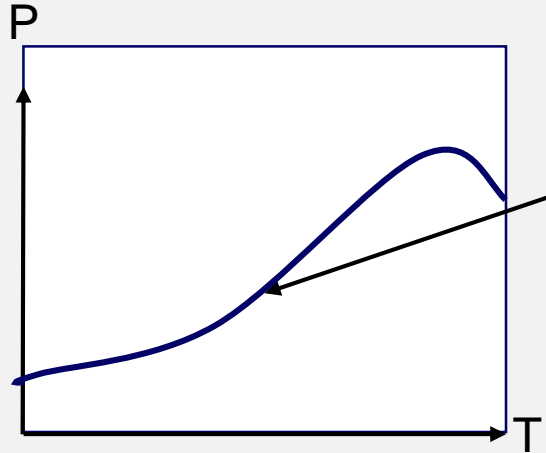
- Projects are what the IPA will justify and prioritise.

Cohort 1
- Tranch 1
- Tranch 2

Cohort 2
- Tranch 3
- Tranch 4

Project 1 (C1T1)
Project 2 (C1T2)
Project 3 (C2T3)
Project 4 (C2T4)

Price Control

Asset Condition

- The assets within each activity will be of similar type and therefore share a similar failure curve.

- The curves are generated from a failure rate, converted to a probability of failure and finally to a probability of first failure within the year (shown below).

- This POFF is converted to a financial impact through Event Tree Analysis.

Failure rate λ
(#/yr)

Prob of failure in year =
$1 - \exp(-\lambda*1)$
(#)

Probability of failure in this year with no failures before (i.e. first failure) =
$(p(NF)^{(yr-1)}) * p(F)$
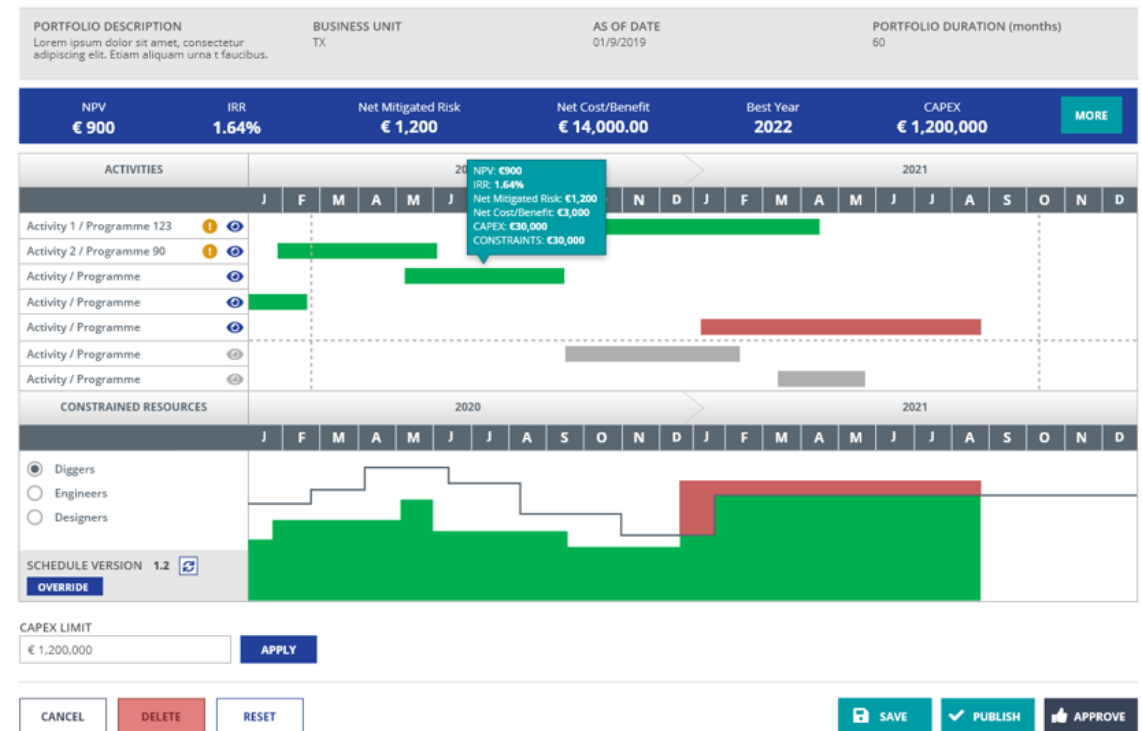(#)

Cost Benefit Analysis

- Once the cost of the POFF/yr is determined a cash flow model of the assets future can be developed.

- Shown is the net cash flow, projected forward and discounted.

- This provides the point in time when the cash flows reaches zero (benefits = investment) and the point in time that gives the greatest benefits for the cost.

Curves for demonstration purposes only
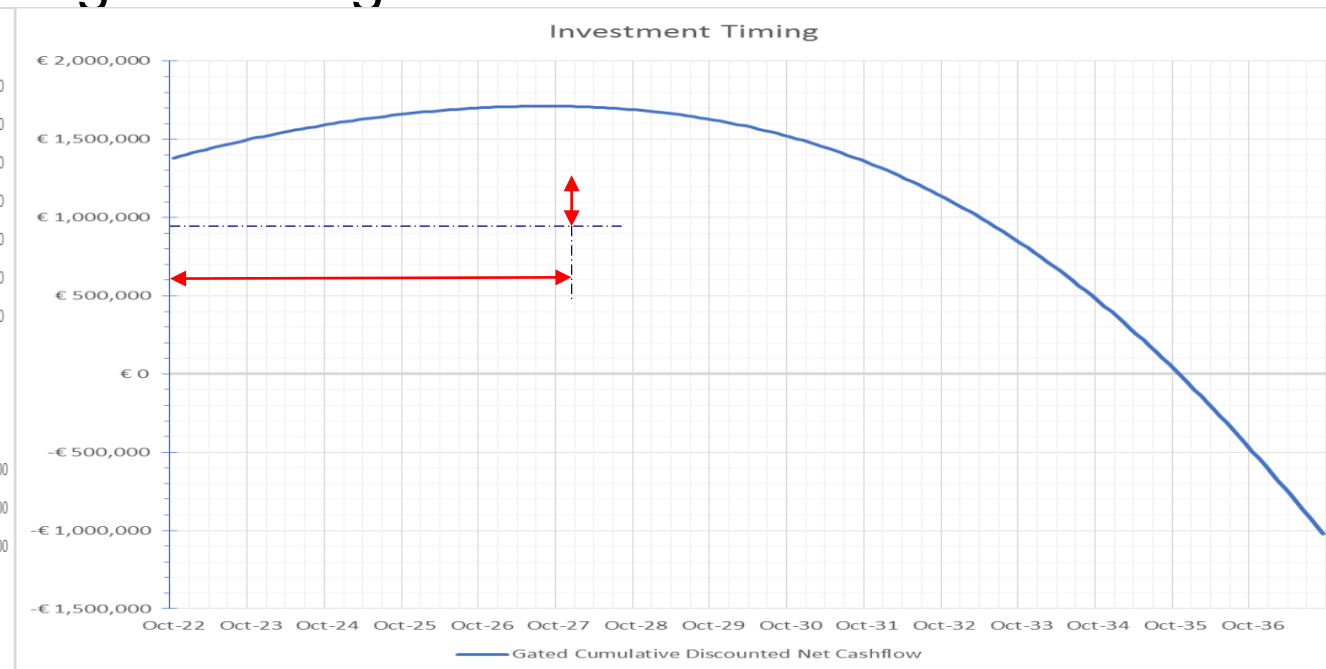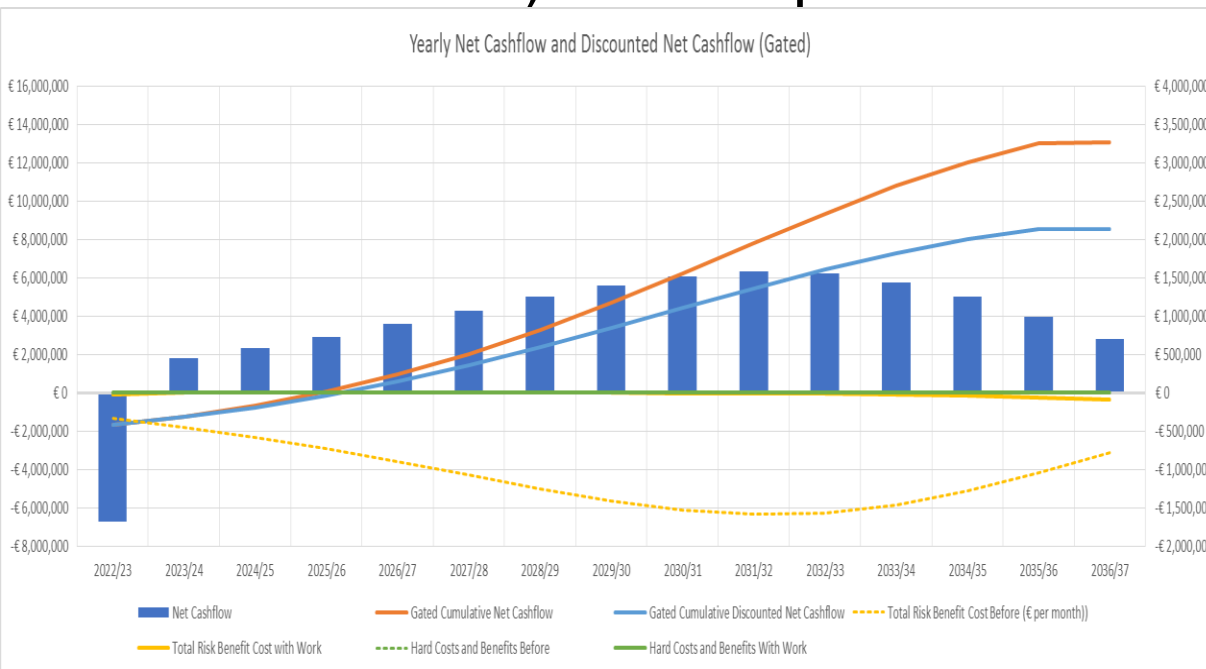
Portfolio Management (Phase 2)

- Reviews the resources and dependencies required for each activity.

- Constraints impeding delivery are highlighted.

- Determines what <u>can</u> be delivered.

- Potential to expand beyond current price controls to feed into the LTSIP.

Questions