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DISTRIBUTION UTILITY MEET
DUM2022

MODEL ASSET MANAGEMENT GUIDELINES FOR INDIAN DISCOMs

AM Roadmap for Indian DISCOM's

Presented By

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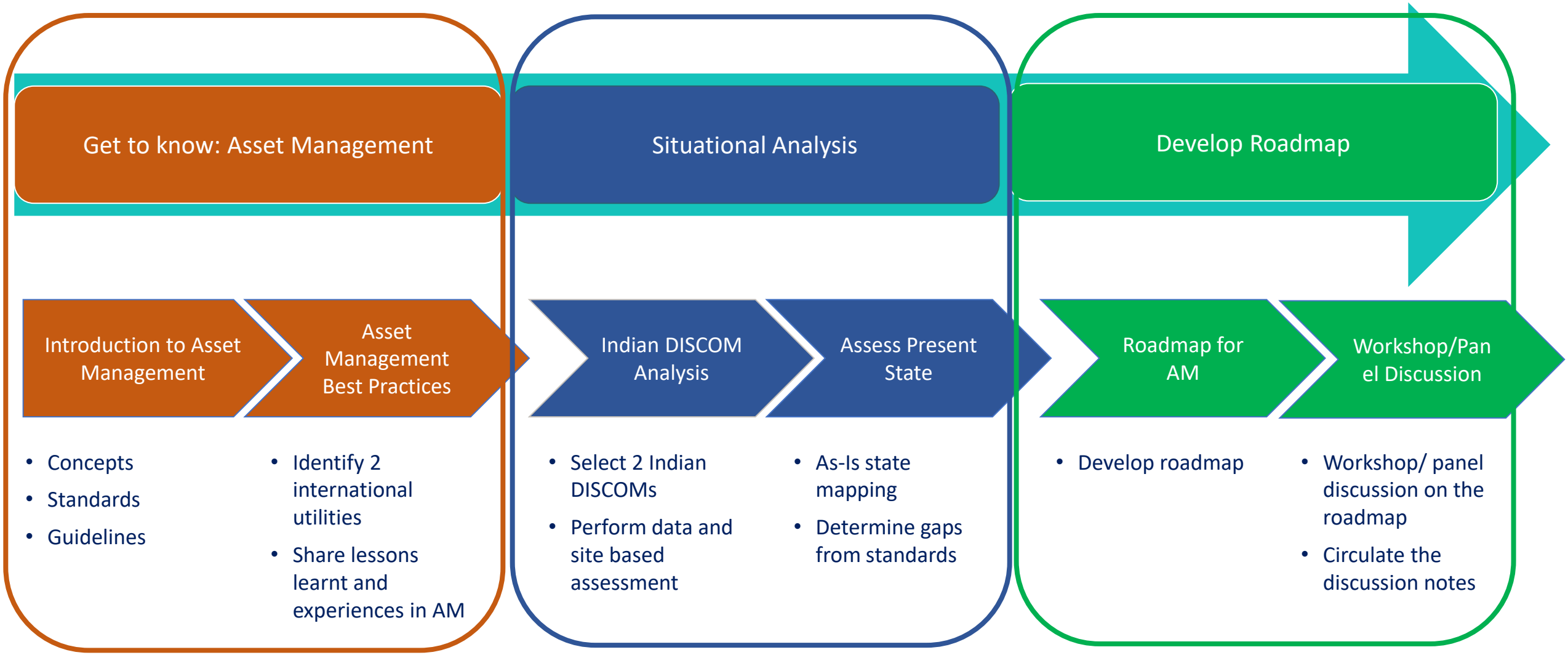
DNV
United Arab Emirates

Contents

Introduction

Approach for development of the Roadmap



Contents

- International knowledge and experience to first describe on a high-level the principles of a roadmap, generic to all DISCOMs
- India-specific, provides stepwise guidelines to finetune high-level roadmap to DISCOM specific roadmap
- Specifies requirements needed for implementing Asset Management
- Guiding Indian DISCOMs through the (re)development strategies, policies, processes, procedures, and systems

The need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The Need of Asset Management System

The need

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Creating more value with data in increasing grid complexity with many stakeholders and renewable energy integration

Core KPI

- Security of Supply
- Quality of Supply
- Safety
- Regulation & compliancy
- Consumer Satisfaction
- Public image
- Sustainability

Existing challenges & opportunities

Data & process standardisation required to reduce complexity with many stakeholders

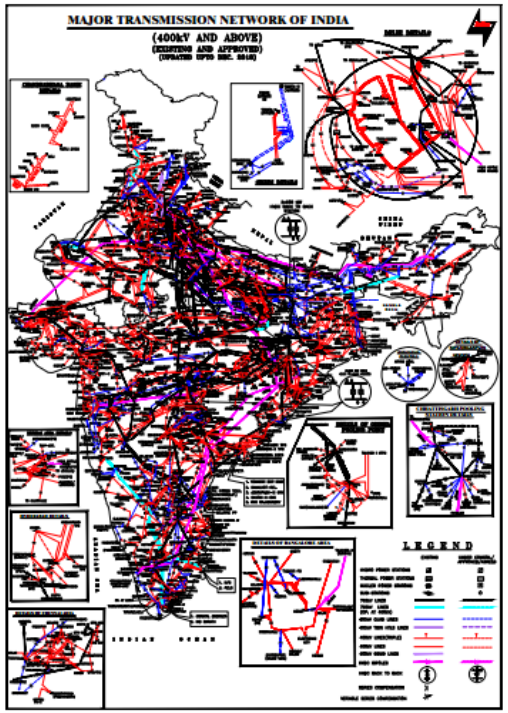
Improved interoperability required between the different solutions and new renewables to improve existing monitoring & control functions and to allow (real-time) calculations & simulations

Improved data quality to allow better (automated) decision-making

New digital technology to be infused in the core processes of the company

Improved **grid development and resiliency** improvement

Strategic priorities



- Improving system operations to meet new demands

“As-Is” state to

“To-Be” state

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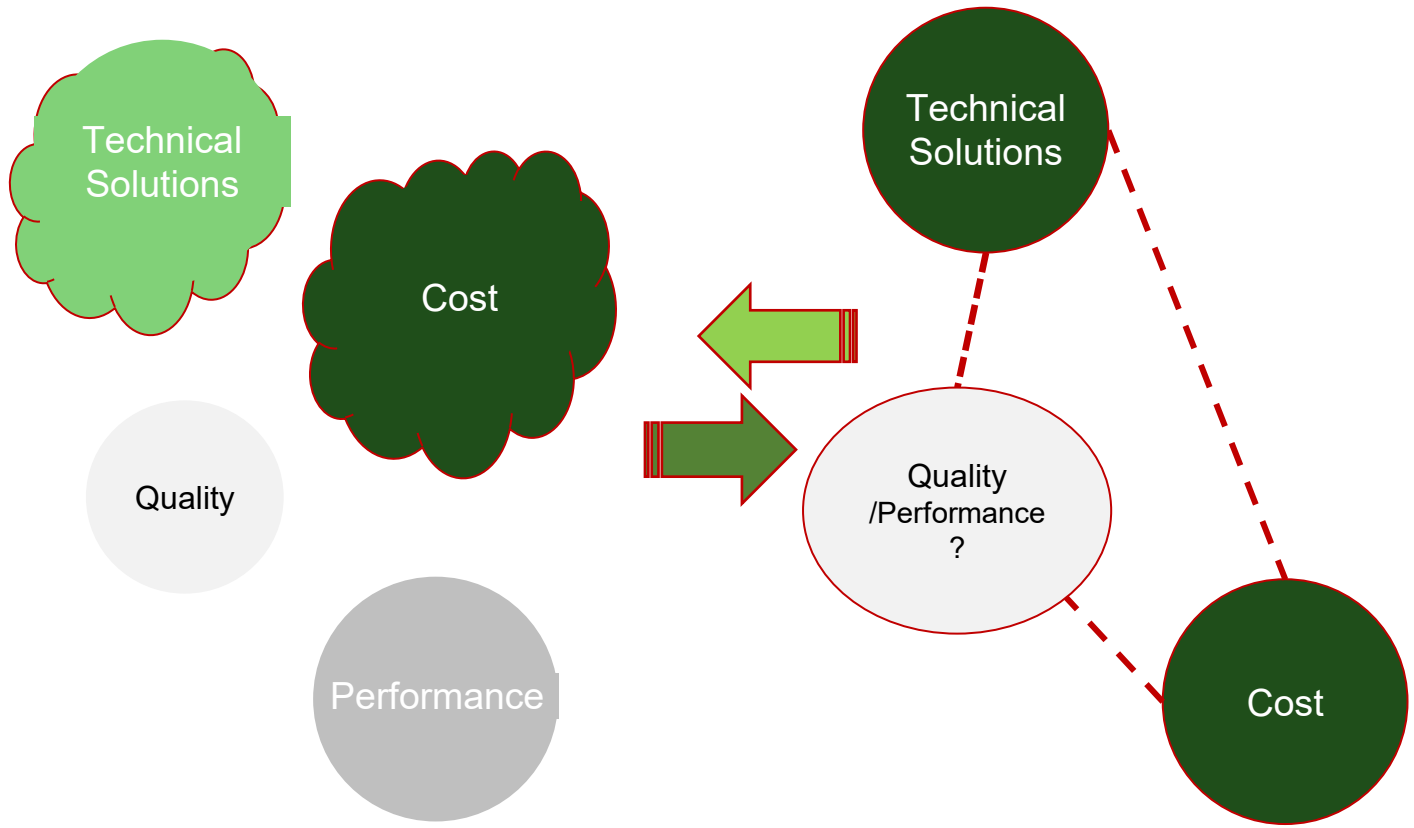
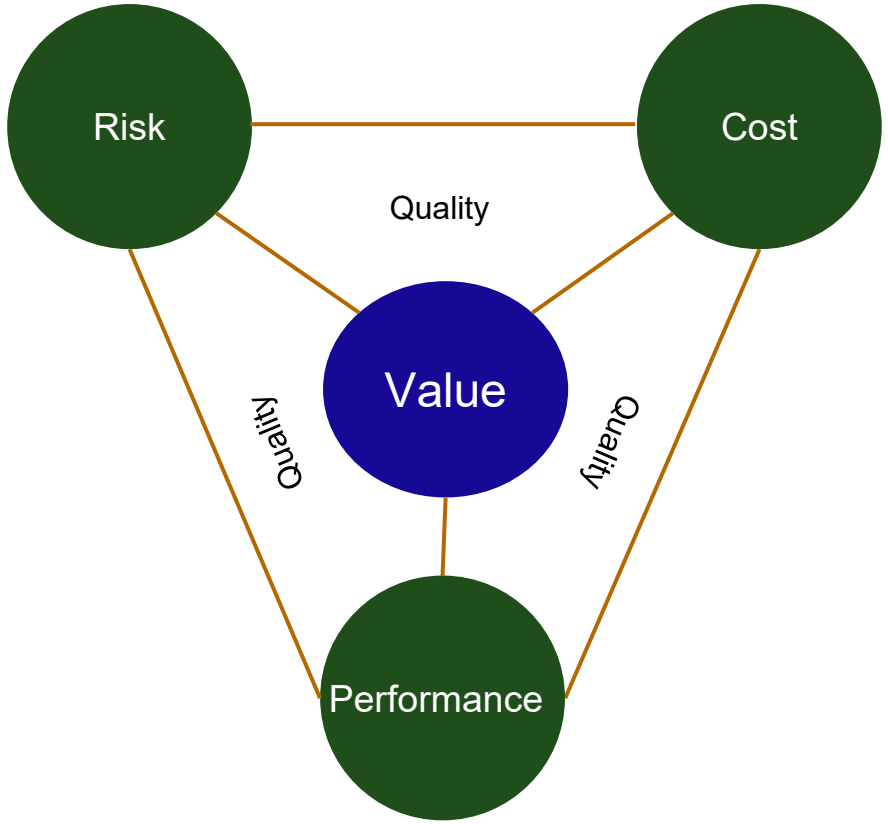
As-Is state


Technical Solutions
Cost
Quality
Performance
Technical Solutions
Quality /Performance ?
Cost

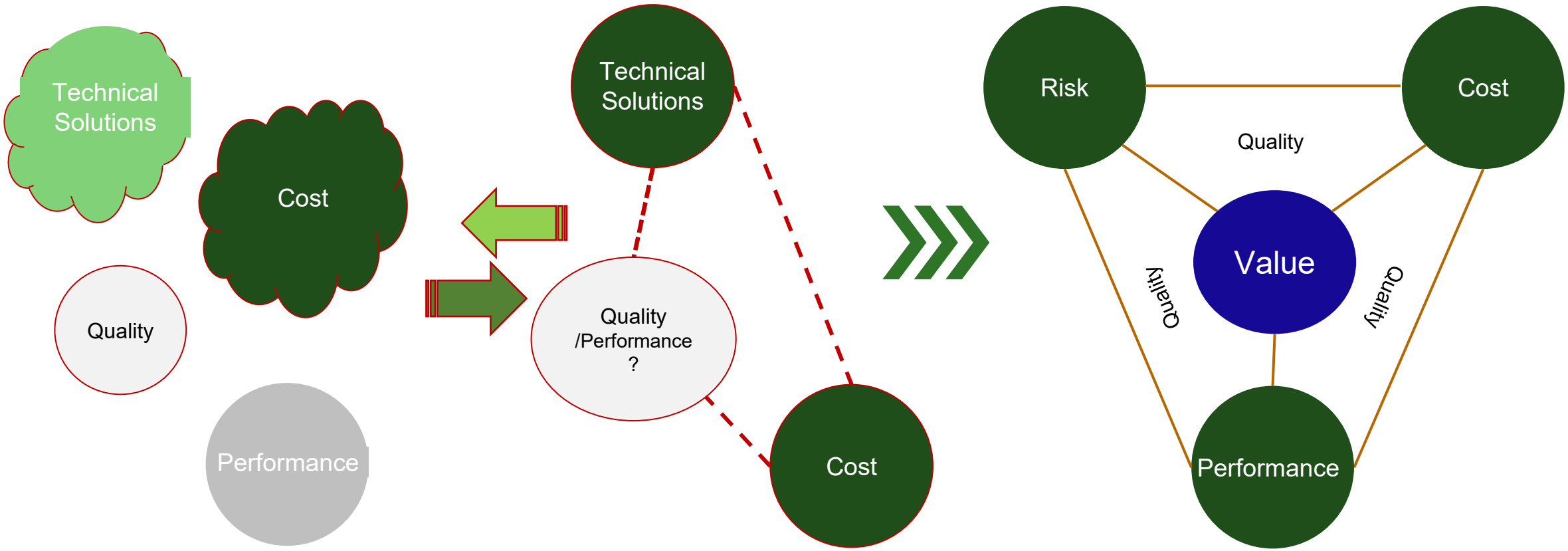
As-Is state

To-Be state


Megger seba
Generator Set
CABLE TEST VAN


Risk
Cost
Quality
Value
Quality
Quality
Performance

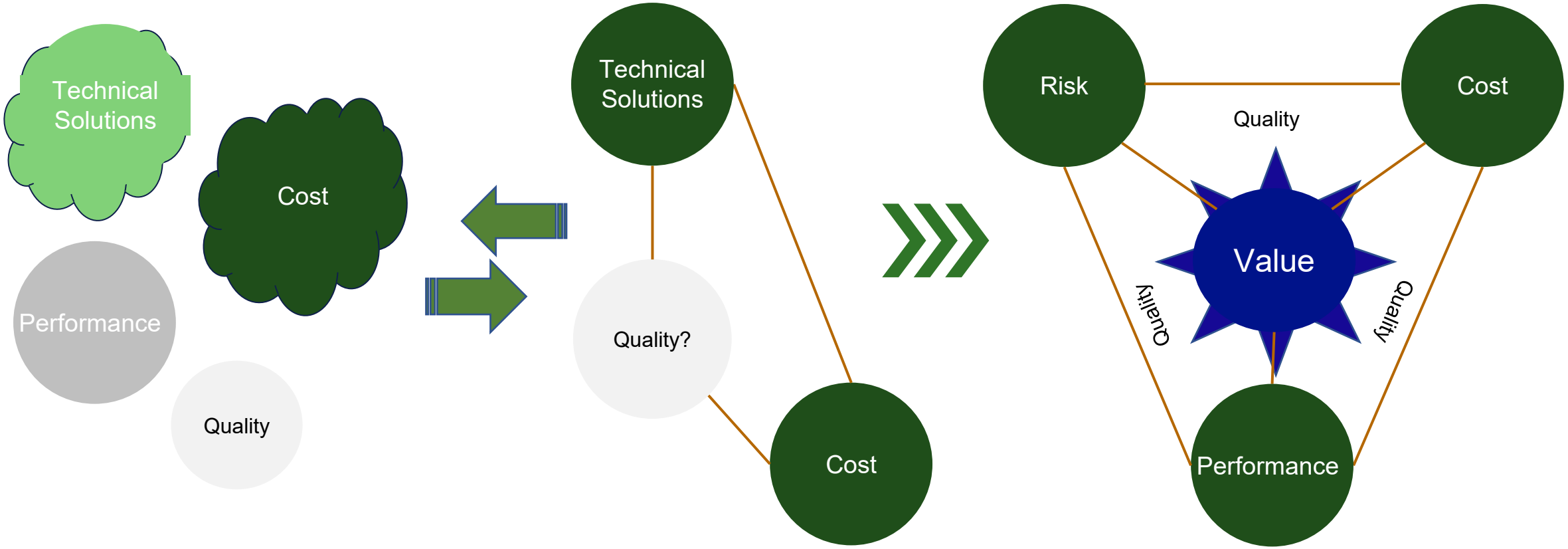
As-Is to To-Be state



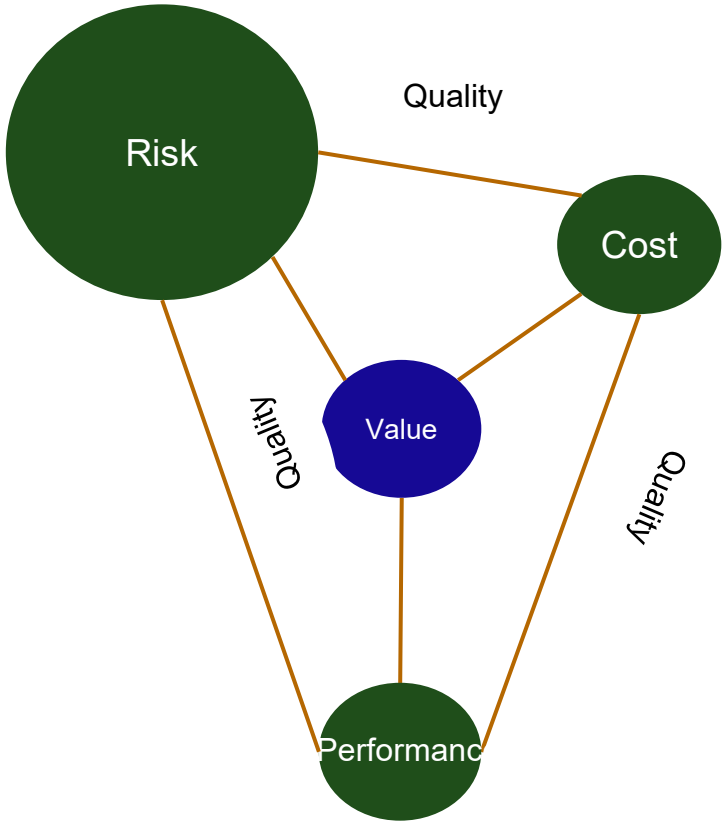
As-Is to To-Be state

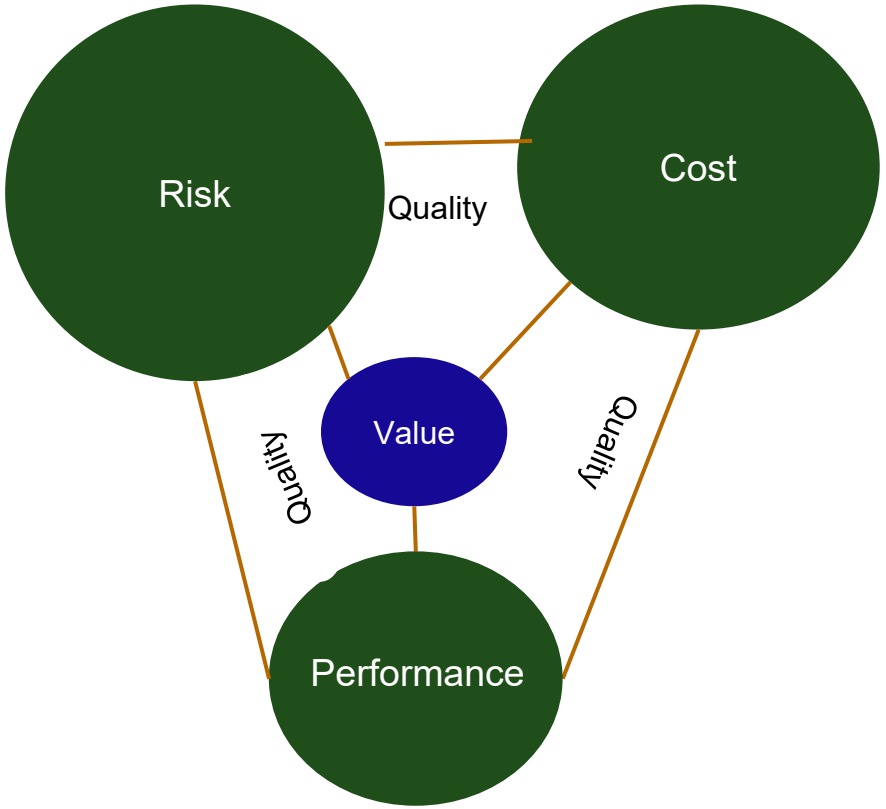
As-Is state

To-Be state



Q&A

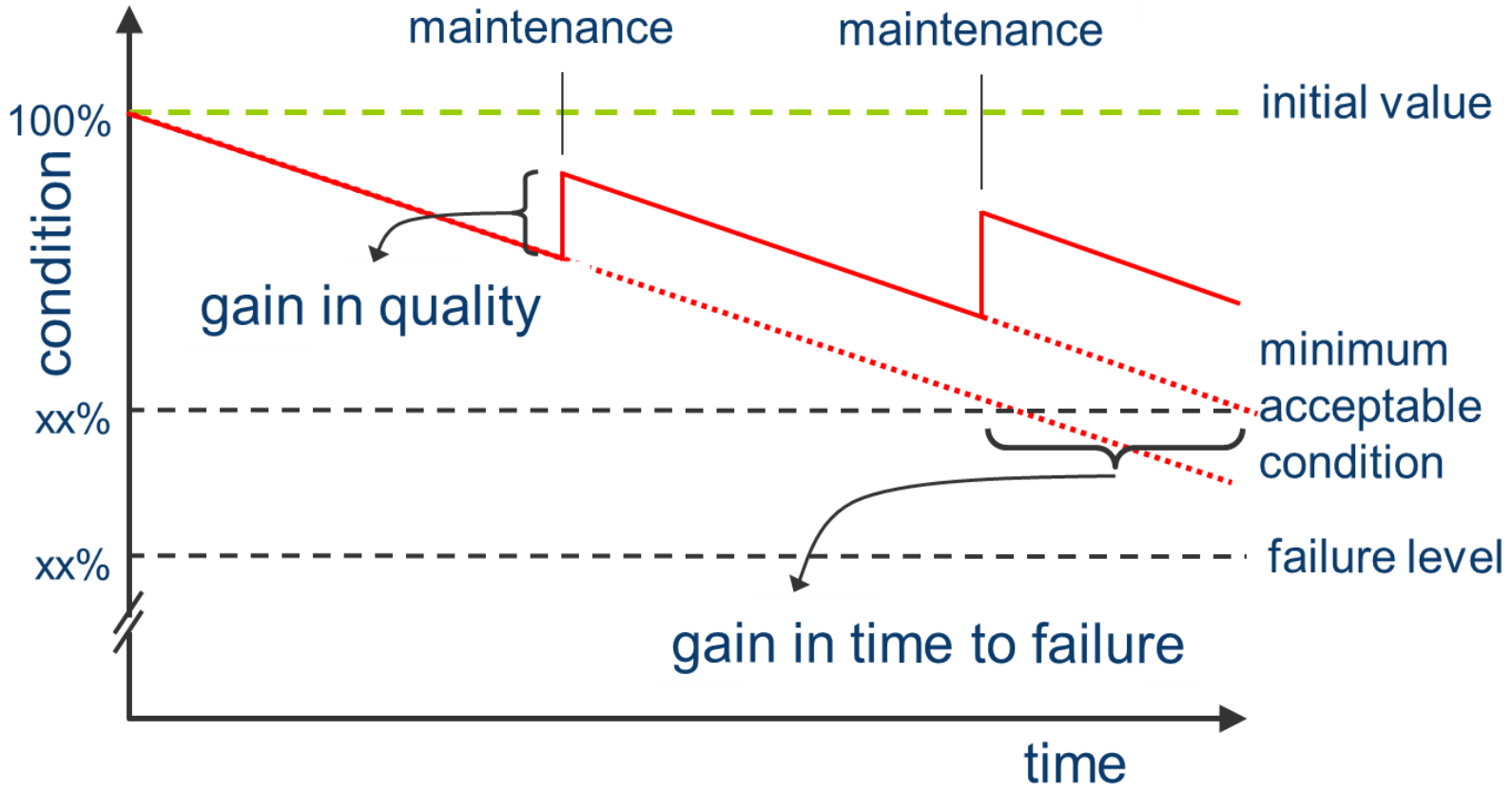

Risk
Quality
Cost
Quality
Value
Quality
Performanc


Risk
Quality
Cost
Quality
Value
Quality
Performance

A Illustration of Gain in Value

Typical situations and improvements for maintenance

- *Much data available in various systems and formats*
- *Different PM plans in different areas, different levels (good, fair, poor) assessed by different inspectors*
- *Collate and deploy equipment inspection data, failure data, condition data, operational data (switching, loading) to determine asset condition.*
- *Gain in quality (equipment integrity) depends on:*
  - ✓ *Maintenance tasks (what is being done)*
  - ✓ *Maintenance procedures (how to work is being done)*
  - ✓ *Timing of the tasks.*
- *Determine both maintenance tasks and timing by equipment condition (analyze inspection data, failure data, condition data, operational data; DNV has all the algorithms)*
- *Review existing PM plan against equipment conditions, against work order backlog and trend, against equipment failure rate trends, against resources (OPEX).*
- *Substantiate the PM plans, review them by area and set thresholds for what really is minimum acceptable level of condition (before another maintenance task or replacement)*
- *Add in Consequence of Failure and prioritize the work based on condition and/or risk.*
- *Implement a system and process that does just this on a continuous/regular basis….*



Roadmap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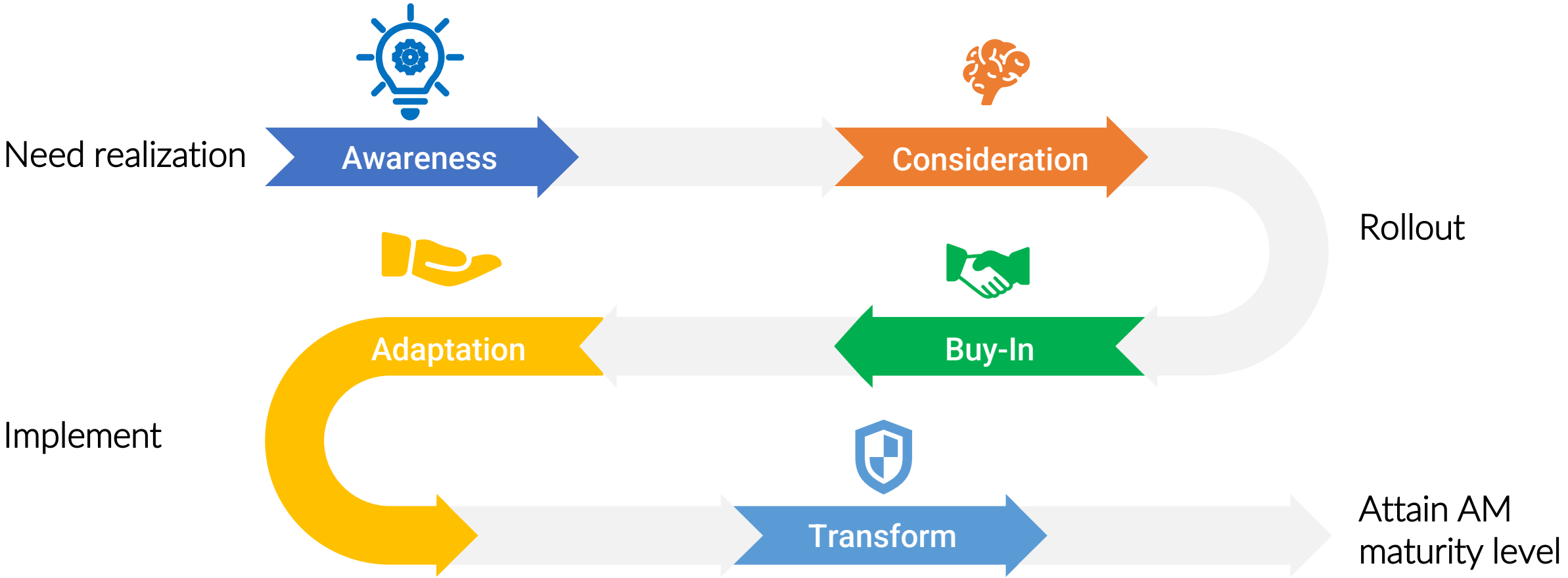
Roadmap Key Contents

A roadmap shows a path to attain mature level of asset management – How to achieve the most value from assets

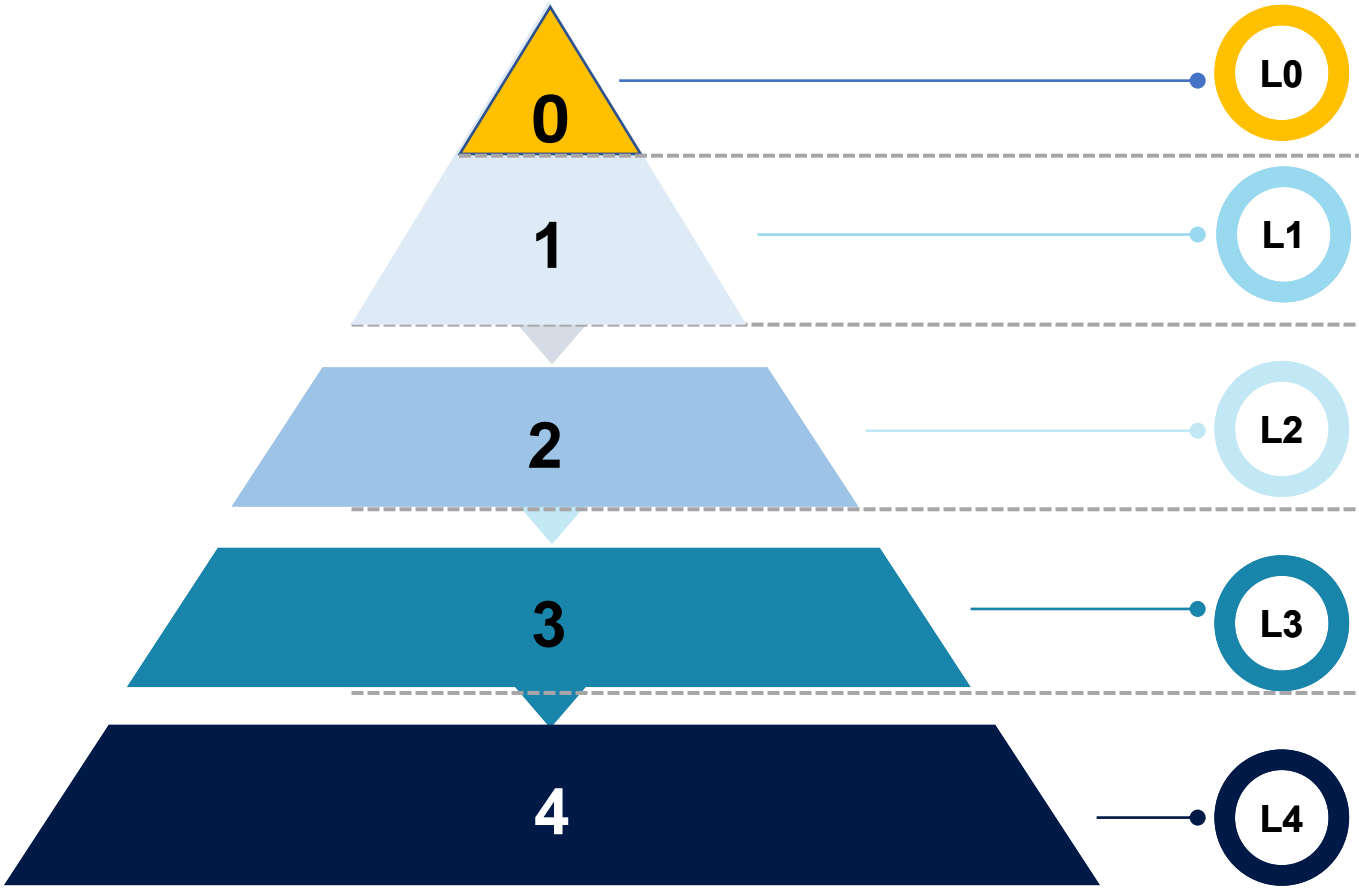
Provides answers to the following questions -

- ✓Who are the actors; Country level, state level and at DISCOM level
- ✓What are the action points
- ✓When to act?
- ✓What shall be done?

Roadmap pathway



AM roadmap implementation steps at DISCOMs



L0 — Map As-Is state (Self check/External expert check)

L1 — Establish basic requirements

L2 — Adopt a basic level of asset management

L3 — Transformation to a learning organisation

L4 — Establish an advanced level of asset management

Asset Management Maturity

Let us do a Self check

Self check questions	No	Yes
1. I have a centralised data depository of capital assets	O	O
i. 33kV Assets		
a. Transformers	O	O
b. Switchgears	O	O
c. OHL and Cables ……	O	O
ii. 11kV Assets		
a. ……	O	O
2. I procure capital assets following a standardised specification tailored to	O	O
i. Standards	O	O
ii. my functional requirements	O	O
iii. My quality requirements ……	O	O
3. I install and commission capital assets following my standardised specification	O	O
4. I monitor operational parameters of capital assets	O	O
5. I follow a scheduled maintenance plan for capital assets	O	O
6. I plan and perform replacement, refurbishment or disposal of capital assets	O	O
7. My all above activities follows the four steps – Plan > Perform > Check > Correct	O	O

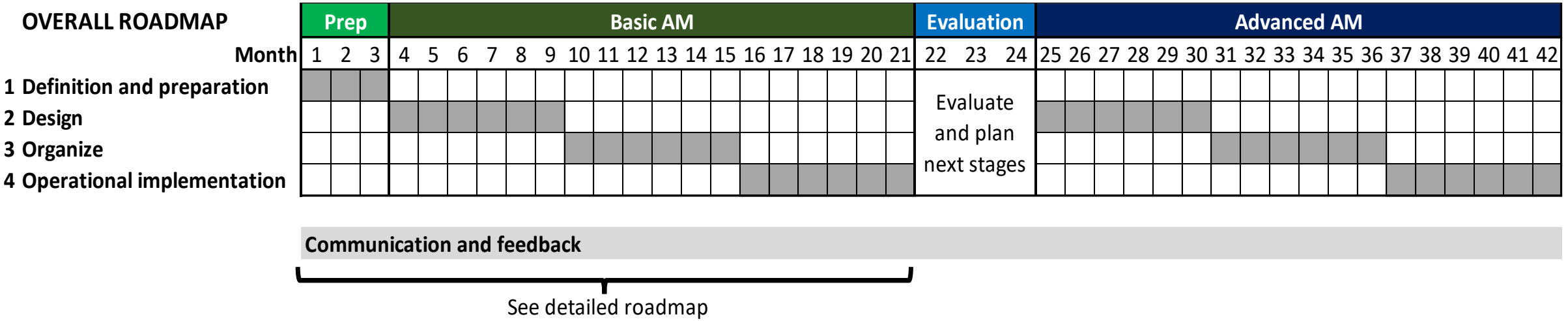
Basic level

Self check

Main Process	Key Questions- Do you have?	Answer- Yes/No
	Mission and Vision statement	
AM Governance	Documented business value and KPIs	
	Risk management policy	
	Asset Management policy	
	Defined Continual improvement process	
	Defined roles of the asset owner, asset manager and service provider	
AM Decision Process	Established process condition assessment of assets	
	Process for risk identification	
	Risk register	
	Asset Management decision-making process with decision criteria	
	Documented process for asset lifecycle management and related procedures	
AM Lifecycle Processes	Documented process for planning and asset management	
	Documented process for procurement with technical vetting	
	Documented process for quality assessment during manufacturing	
	Documented process for installation	
	Documented process for commissioning	
	Documented process for disposal	
	Asset register	
AM System	Process of assessing the quality of data (complete, correct, available)	
	IT systems for asset management	
	Documented Asset Information model	

Scale	Description	Definition
0	**Innocent**	The organisation has not recognised the need for this requirement and/or there is no evidence of commitment to put it in place.
1	**Aware**	The organisation has identified the need for this requirement, and there is evidence of intent to progress it.
2	**Developing**	The organisation has identified the means of systematically and consistently achieving the requirements, and can demonstrate that these are being progressed with credible and resourced plans in place.
3	**Competent**	The organisation can demonstrate that it systematically and consistently achieves relevant requirements set out in ISO 55001.
4	**Optimising**	The organisation can demonstrate that it is systematically and consistently optimising its asset management practice, in line with the organisation's objectives and operating context.
5	**Excellent**	The organisation can demonstrate that it employs the leading practices, and achieves maximum value from the management of its assets, in line with the organisation's objectives and operating context.

Implementation duration for a typical DISCOM



An International case study

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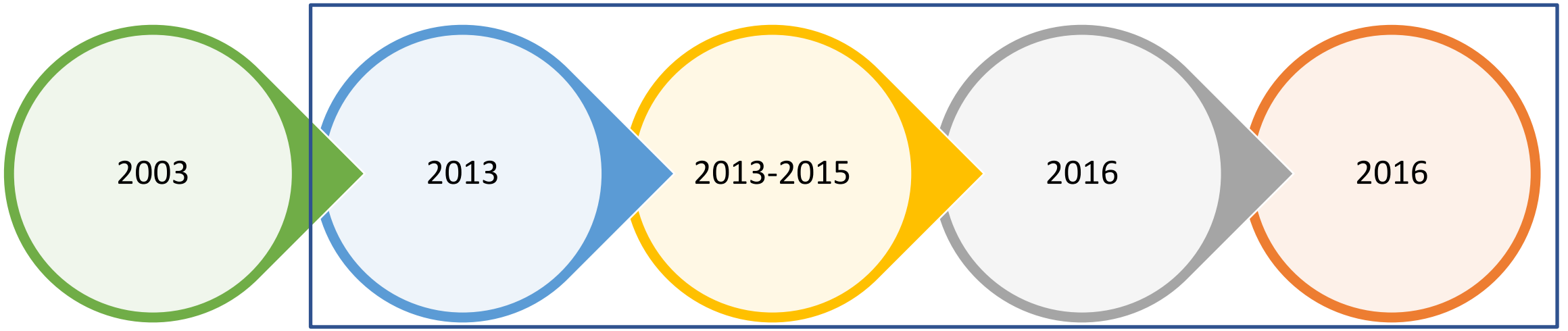
Timeline Till Accreditation



- Set vision to be best DSOs in Sultanate of Oman
- Started exploring the challenges within the company
- addressed them into aspects for improvements

- Set objective to attain ISO55000 accreditation in 3 years
- Established Asset Management department
- Identified stakeholders
- Established KPIs
- Share learnings with other DSOs of Oman
- Engaged consultant to support

- Identified the requirements of ISO 55001
- Started gradually fulfilling the requirements , change management and culture
- Regular internal and external Independent Auditing to map As-Is state and gap analysis

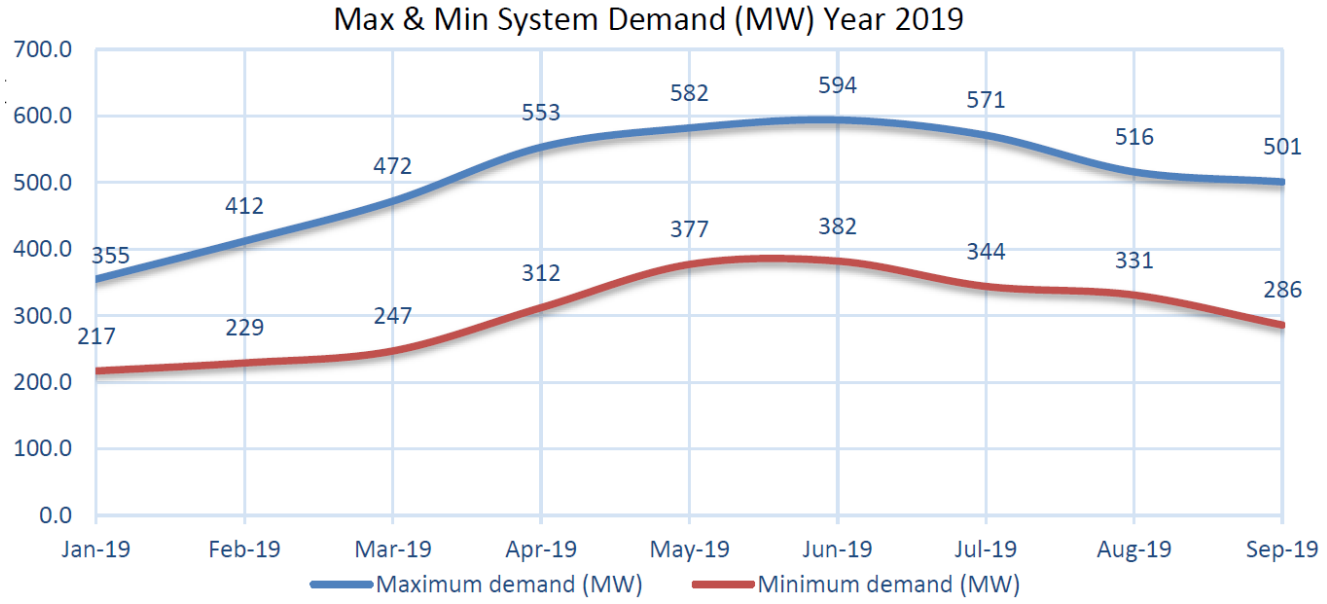
- Continued to improve the asset management processes and procedures
- A number of stage assessments were conducted by an Independent Auditing Body against the requirements of guideline ISO 55001:2014

- ISO Accreditation

Dhofar Integrated Services Company

DISC Electricity Distribution Grid*

- 33kV Network ~ 260 km OHL; 790 km Cables
- 11kV Network ~ 1220 km OHL; 1350 km Cables
- 0.4kV Network ~ 1600 km OHL; 1600 km Cables
- 11/0.4kV Pole mounted transformers ~
- 124,000 customer accounts in 2020



*2019/2020 data

DISC Motivation and Benefits from AM System

Vision Mission and Values

Mission

Providing safe, reliable and efficient electricity, water and wastewater services that create added value for our customers and stakeholders.

Vision

Exceed customer expectations and create a name among the region's leading utilities companies through a dedicated and competent team and adherence to international best practices.

Values

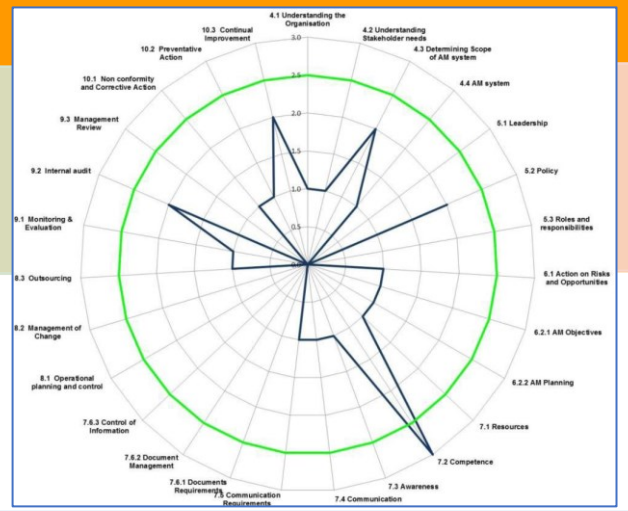
- Integrity
- Professionalism
- Respect
- Customer service

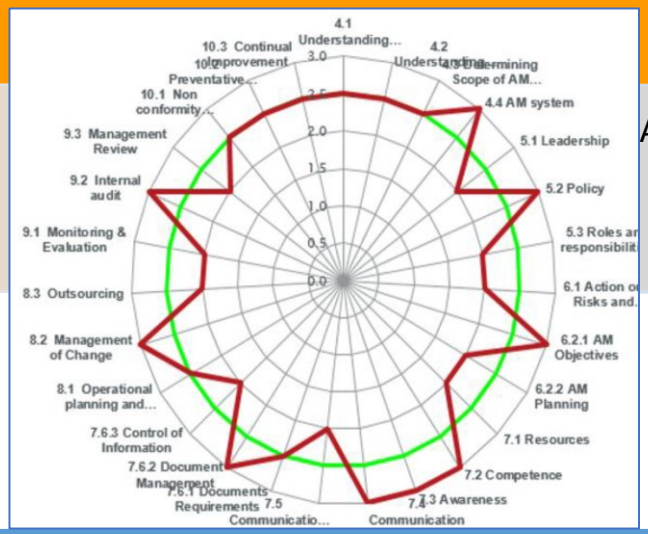
Journey of DISC Towards an Accredited AM System

Gaps and Adopted Mitigation Measures

Start

As-Is state





After transforming in learning organisation

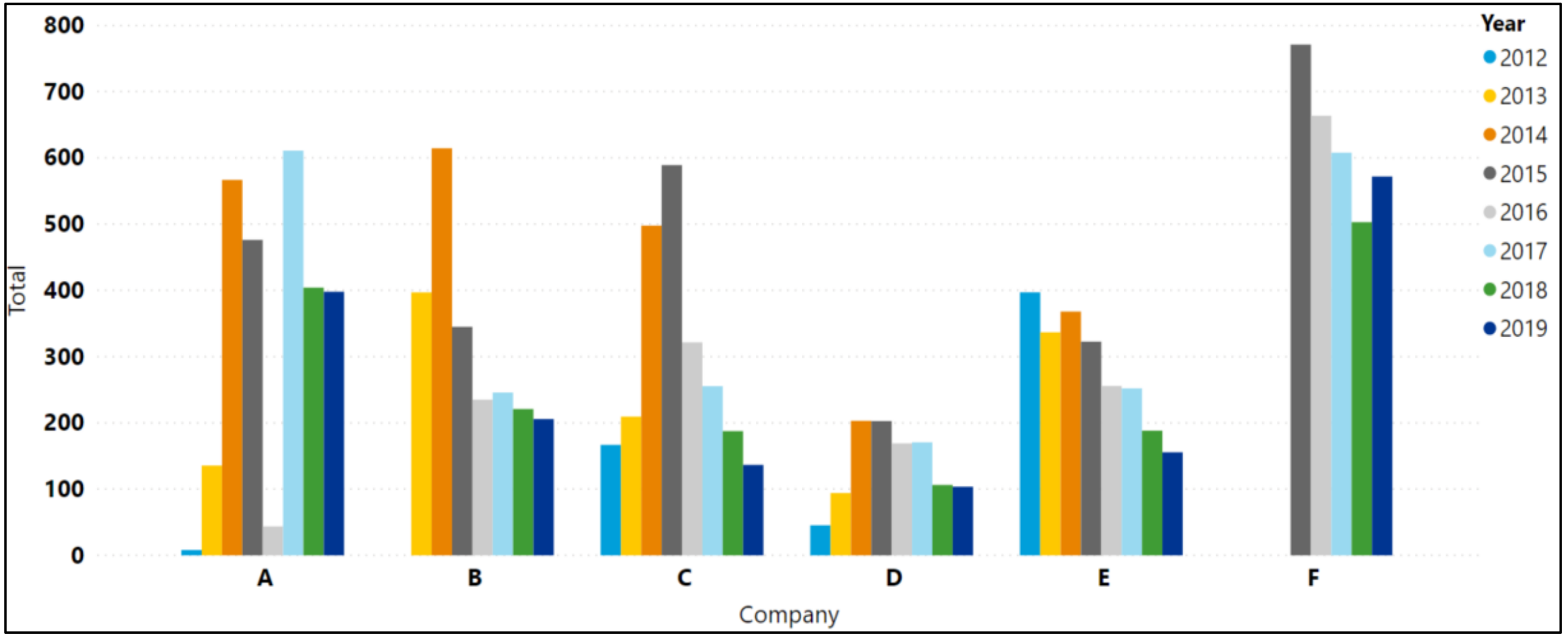
Incremental steps taken during the journey

Resources and capability	Competence	Awareness	Information requirements

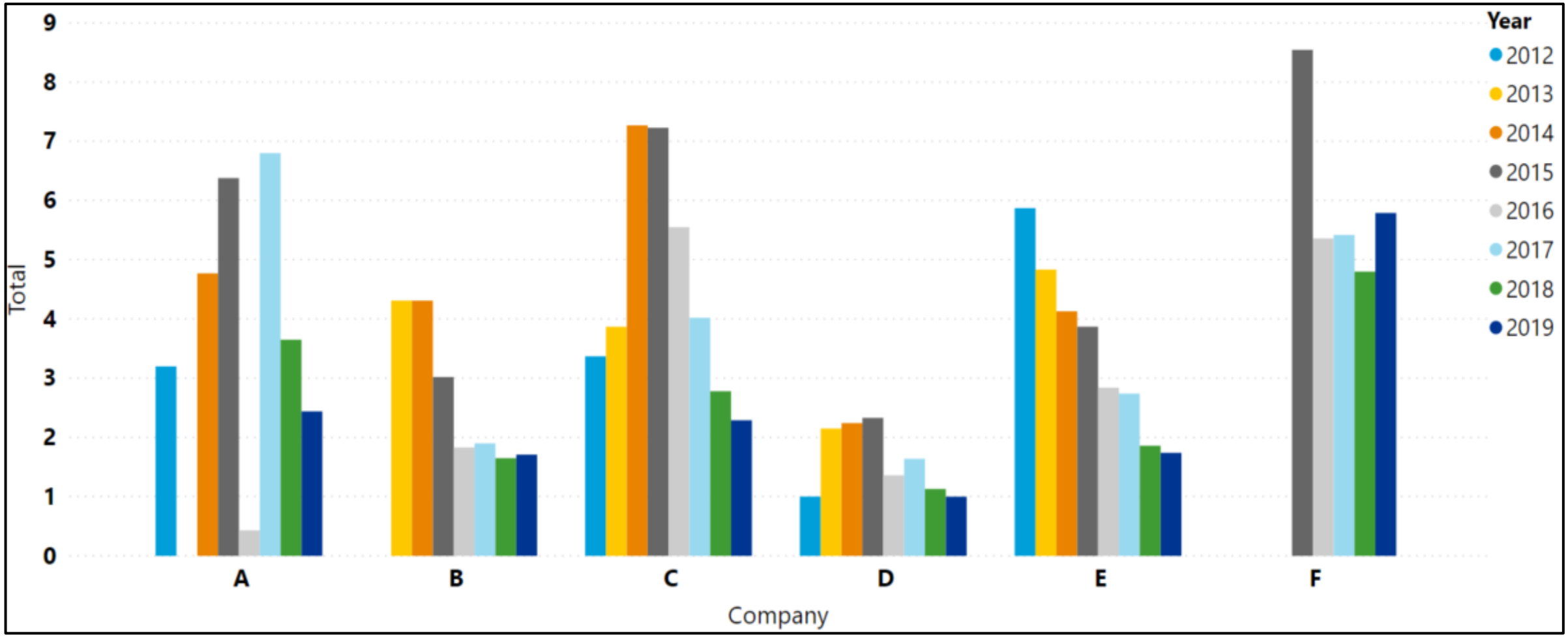
Challenges During The Journey

- Inherited assumptions
- Task of improvement
- Behavioral issues
- Limited Competency
- Lack of understanding
- Work methods
- Safety work practices

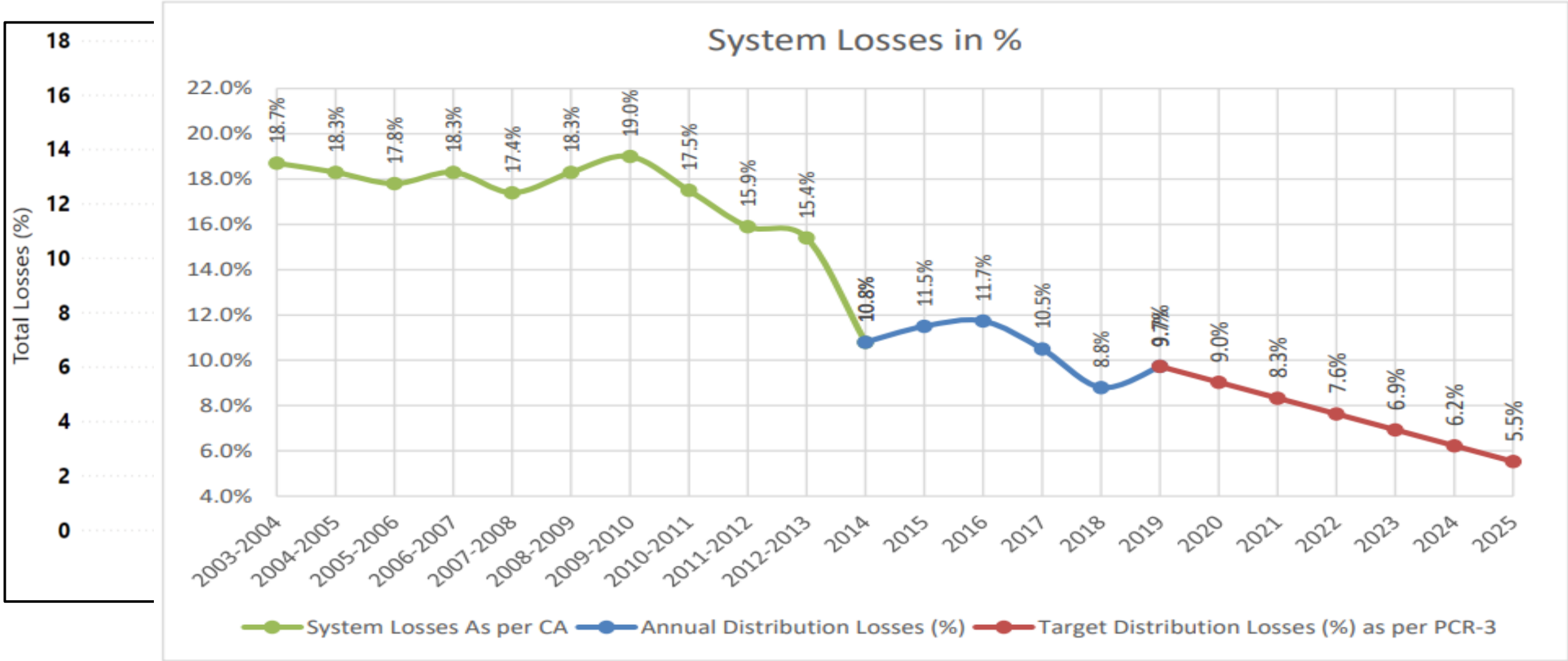
Network Reliability SAIDI



Network Reliability SAIFI

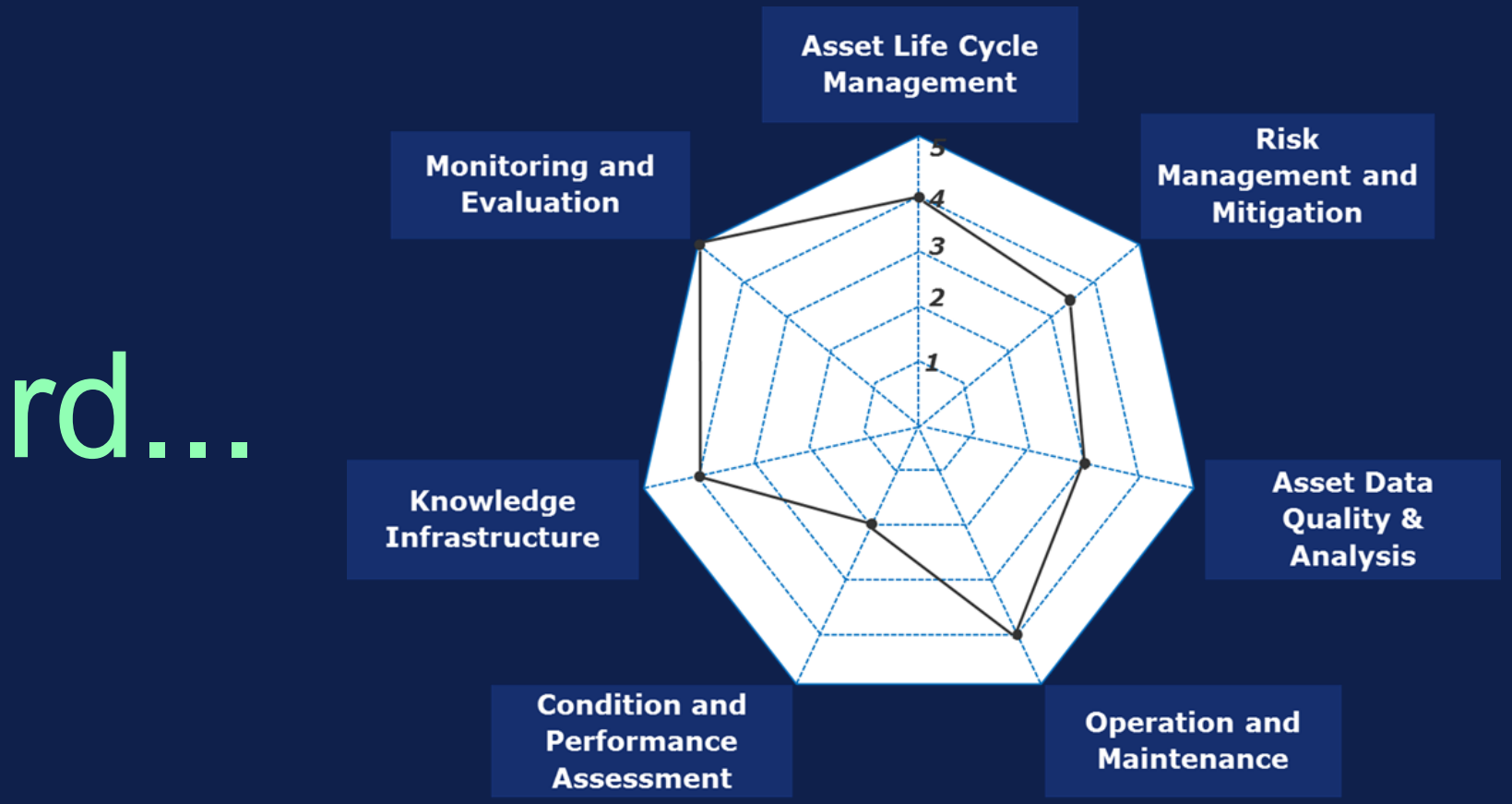


Network losses



http://dpcoman.com/Capability/R2%20DPC-NPD-08-CPSR-1900%20Capability%20Statement%202020-2022.pdf

Way forward…



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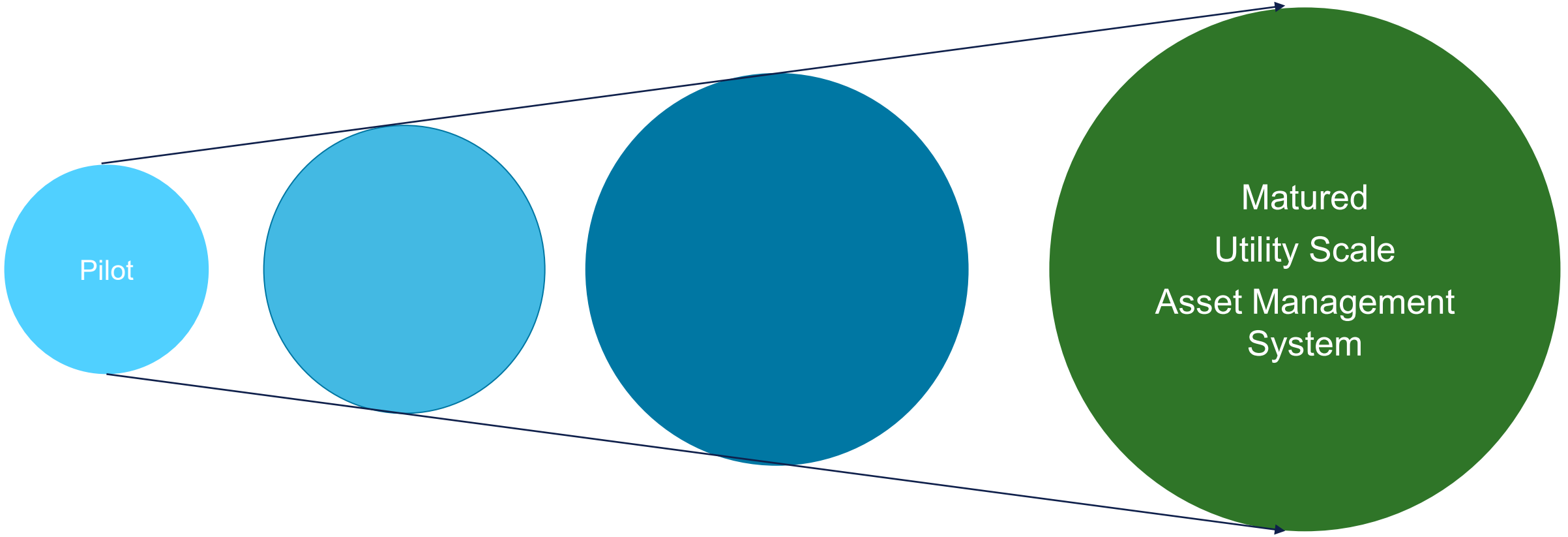
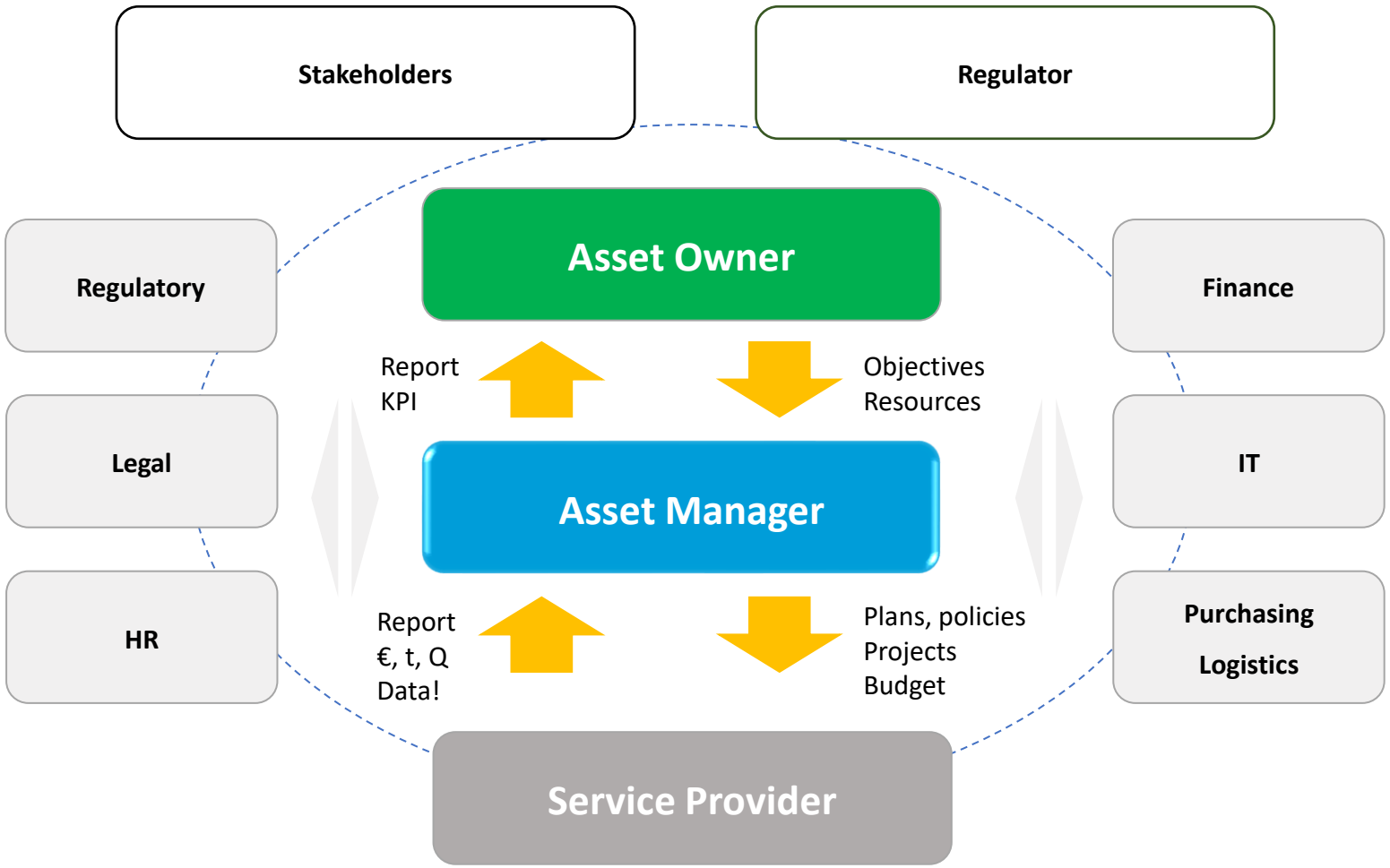
Pilot to Utility Scale Asset Management System

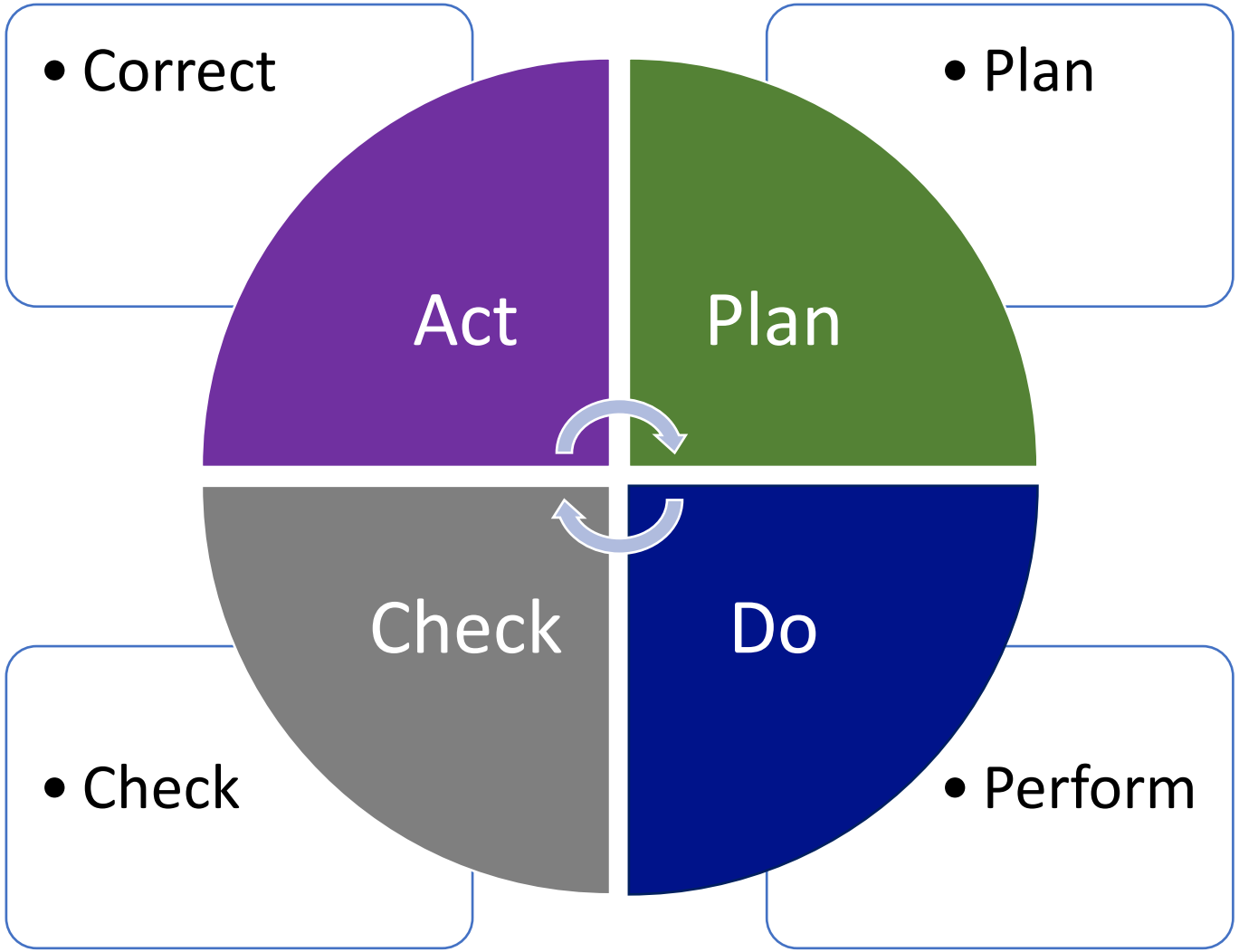


Asset Management Organisation



- **Asset Owner** is responsible for:
  - Business strategy and goals
  - Business values
  - Financing and return on investments
- **Asset Manager** is responsible for:
  - Operational strategy in topics: policies, planning and investment programs
  - Ensure functionality, performance and cost control
  - Decision making on topics as:
    - Asset / service / financial performance
    - Risk management (technical, safety, economical, environmental, legal, …)
- **Service Provider** is responsible for:
  - Implement policies according to agreed specifications relating to security, planning, budget
  - Operational safety
  - Quick response on faults
  - Cost efficiency

PDCA



Q&A

Word of Gratitude

THANK YOU

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