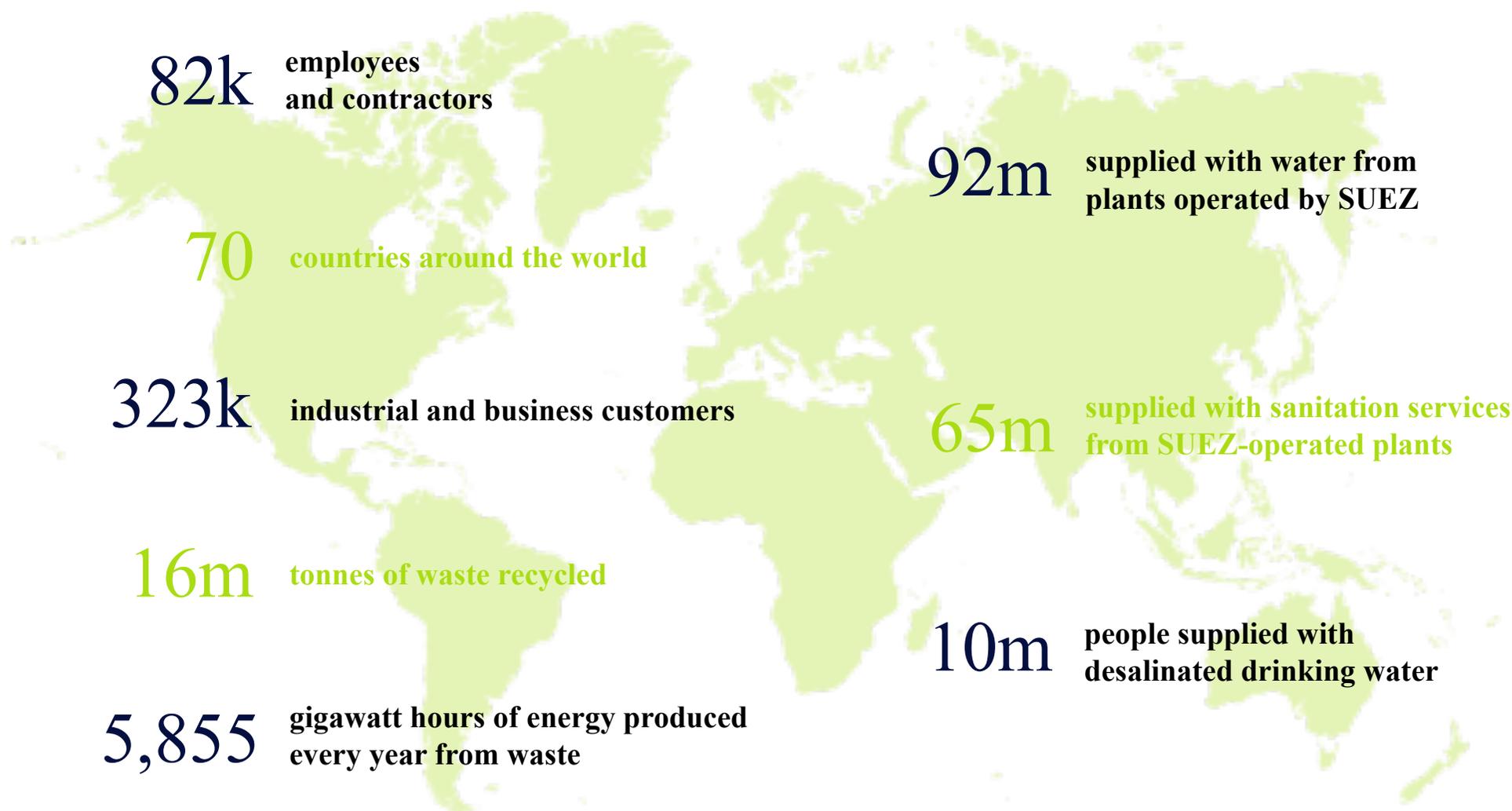




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SUEZ around the world



2. SUEZ ASIA

Our presence in Asia



Key facts and figures

CHINA

8,000+ 
employees

20  **36** 
managing 36 water contracts
in more than 20 cities

240 
building over 240 water or
wastewater treatment plants

HONGKONG 
operating and managing
two of the world's largest landfills in Hong Kong

SHANGHAI 
operating and managing
Asia's largest hazardous waste incinerator in Shanghai

11 
providing environmental services
to 11 China's industrial parks

SOUTH EAST ASIA

60+ 
years presence in Southeast Asia

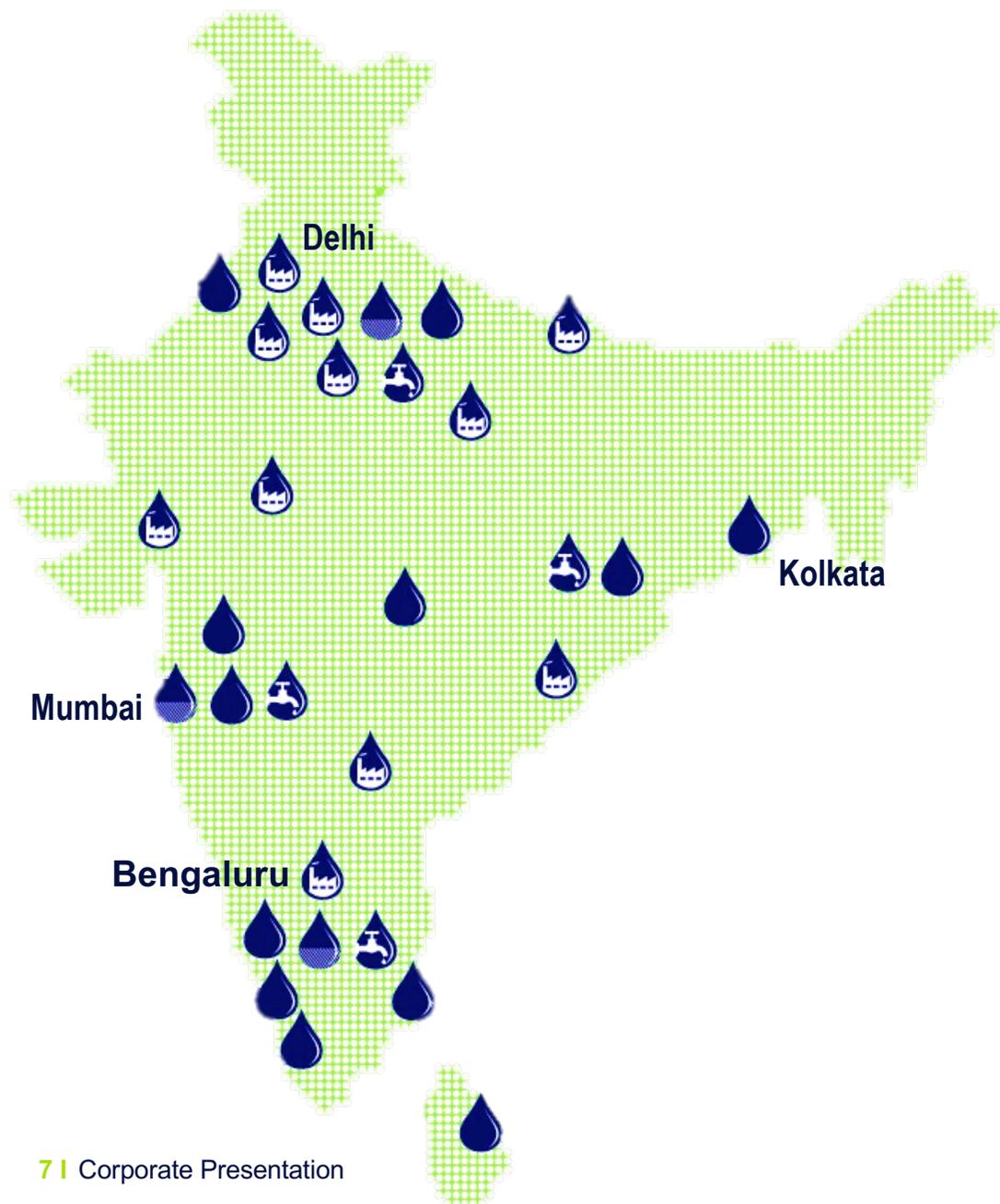
1,500+ 
employees

180 
water / wastewater plants built

20 million+ 
inhabitants with
drinking water provision

3. SUEZ INDIA

Our presence in India



Turning
global knowledge
into local solutions,
for more than
30 years

-  Water Treatment
-  Wastewater Treatment
-  Industrial Water
-  Water Services

Key facts and figures

INDIA

5.5 billion 
liters of drinking water
produced everyday

15 million 
people serviced by SUEZ's
expertise in improving water network
and distribution

3,500 billion
liters of water distribution improved
through specialised services

26 million 
people benefit from the wastewater
treatment

30+ 
years presence

1,000+ 
employees

30+
years of presence
255 
water & wastewater treatment
plants designed and built

44 million+ 
inhabitants with
drinking water provision

4. SUEZ OCEANIA

Our presence in Oceania



Key facts and figures

AUSTRALIA

2,600+ 
employees and contractors

3.7m 
Australians serviced weekly

7m 
inhabitants supplied with water

3.3m 
tons of waste recycled or disposed

56k 
waste commercial and industrial customers

55 
water & treatment operations across Australia
and New Zealand

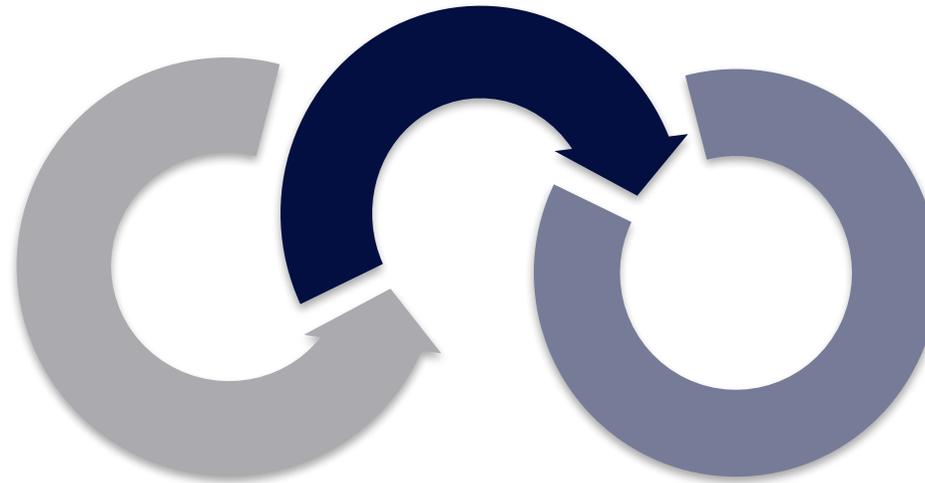
II. WIKTI

ORIGINS & EXAMPLES IN OPERATIONS

What is WIKTI®?

A method enabling target and action plan to be defined

An objective evaluation of the level maturity of all business processes

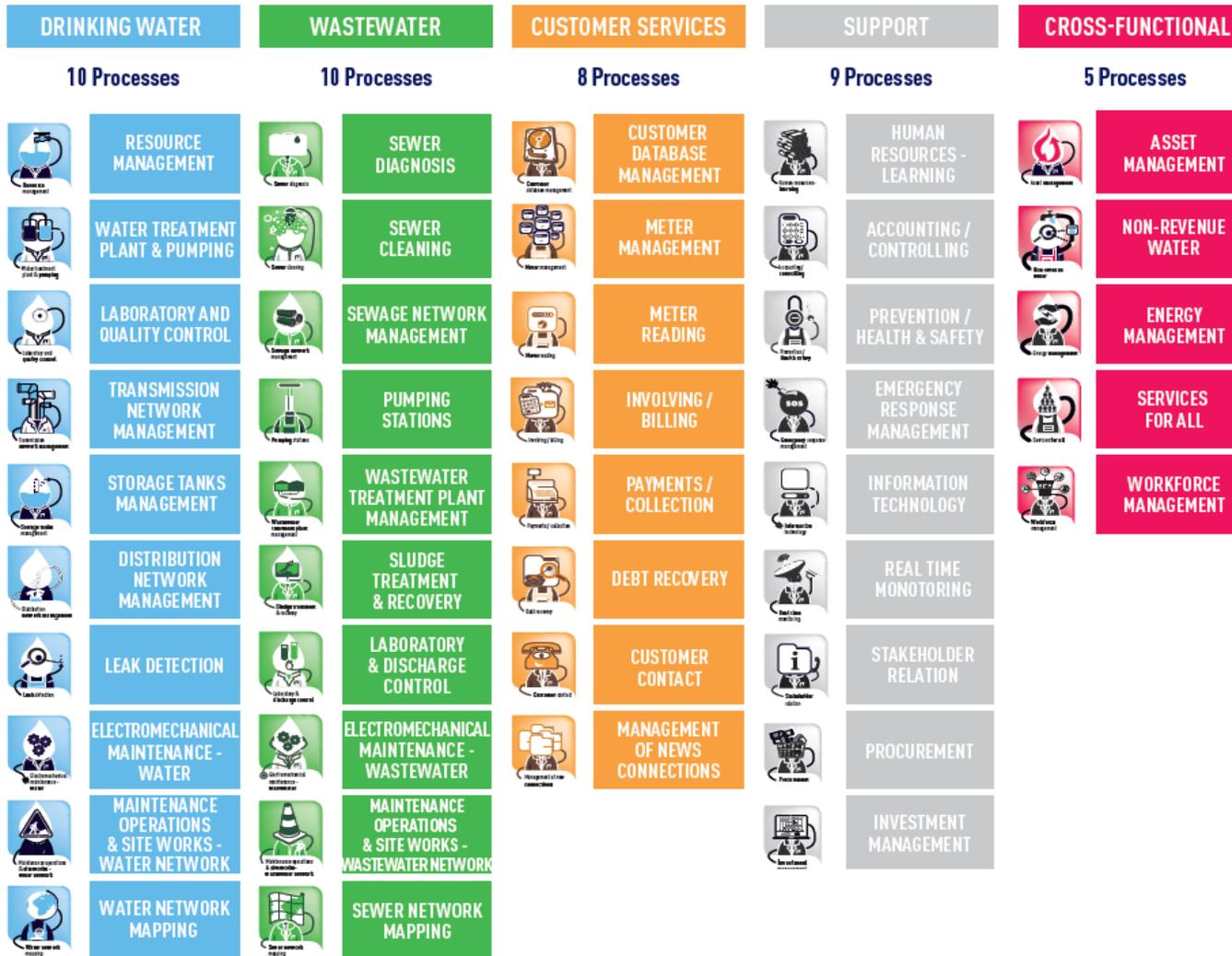


Access to SUEZ know-how in a simple and structured way

WIKTI® is a performance management tool leading a water utility towards excellence

Principle: A 3-step method

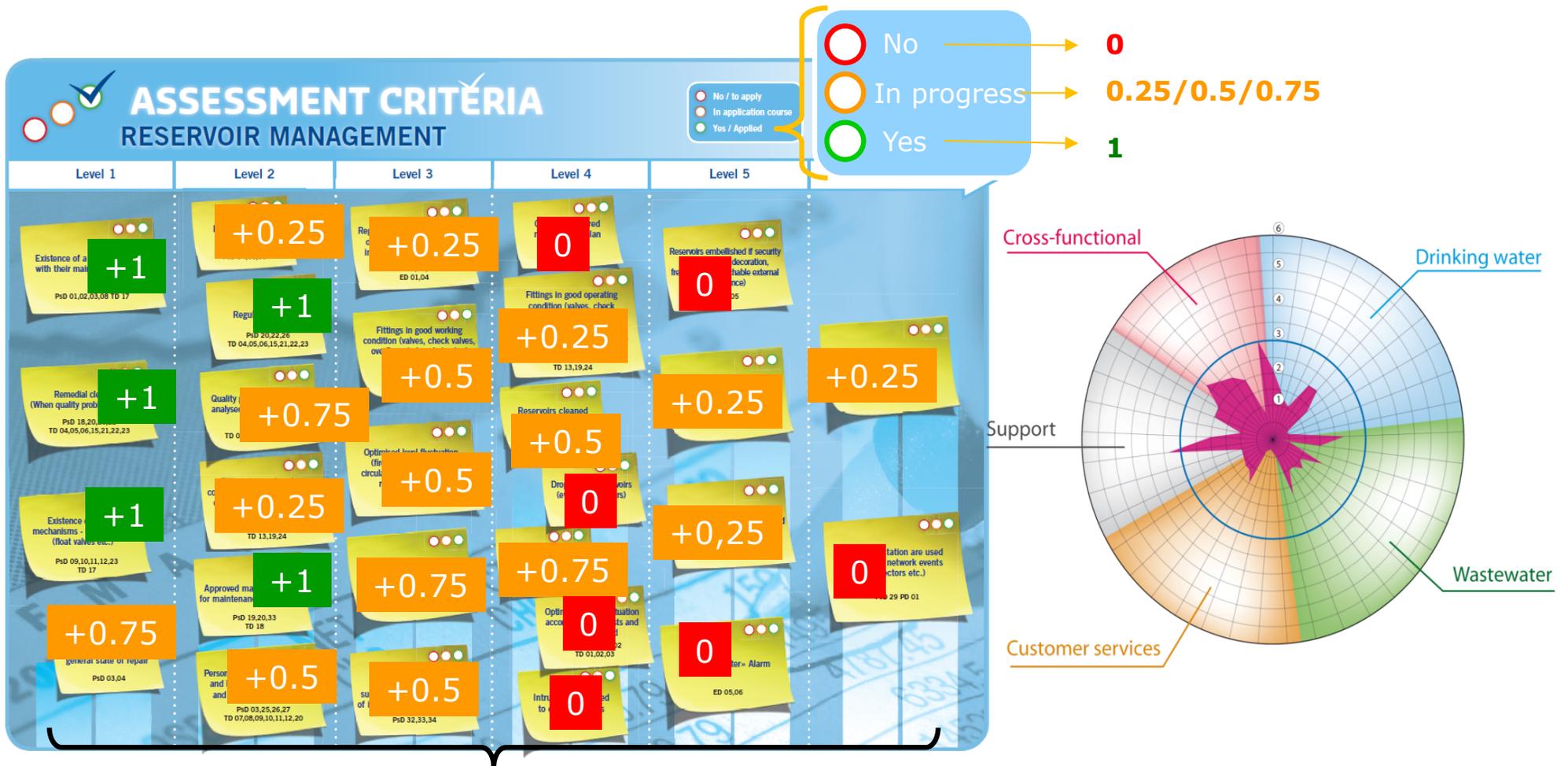
Step 1: Segmentation



Company's activity is divided in 5 business lines comprising 42 business processes

Principle: A 3-step method

Step 1: Initial assessment

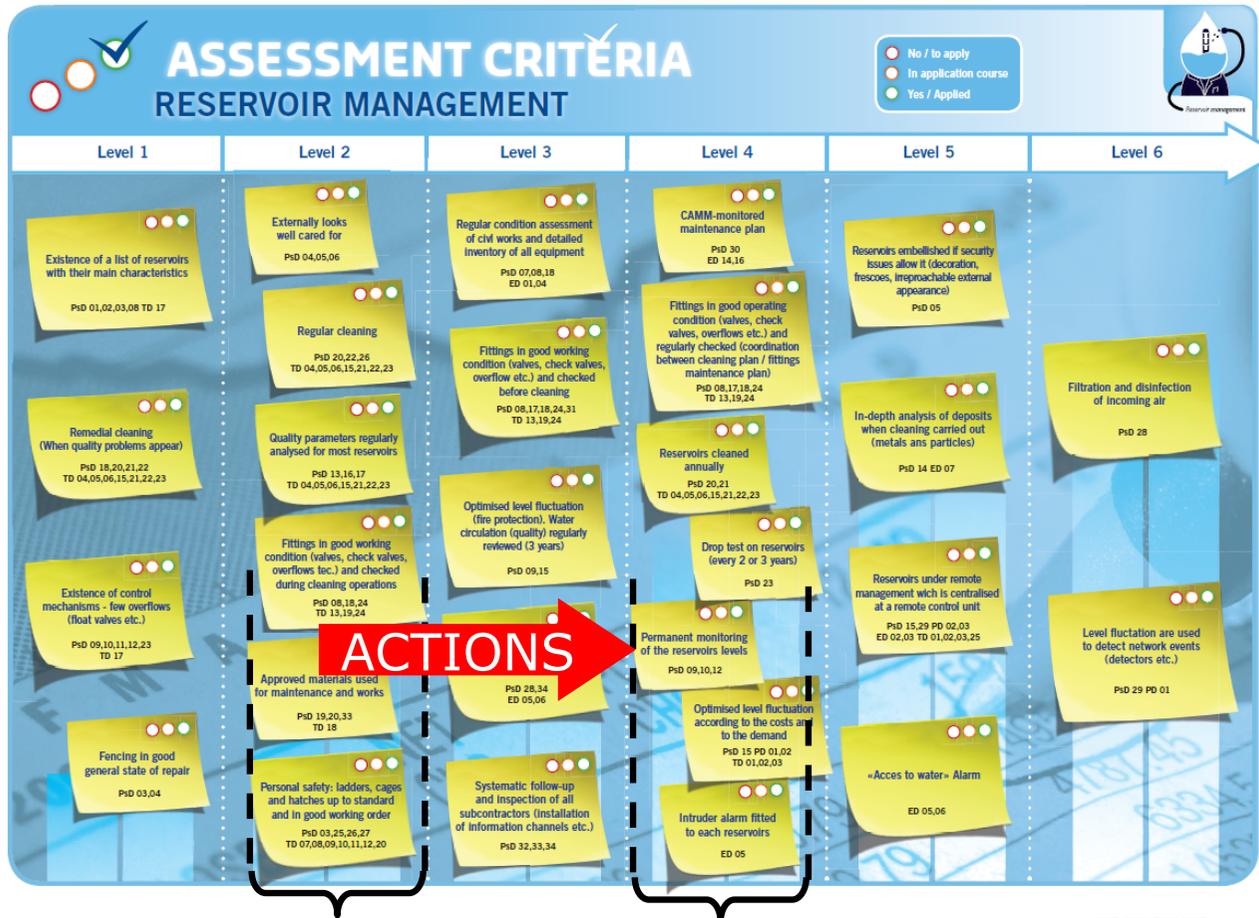


Starting level = 2.53 **x 42** **360° Assessment**

Objective assessment criteria for each business process

Principle: A 3-step method

Step 2: Define the target and an action plan



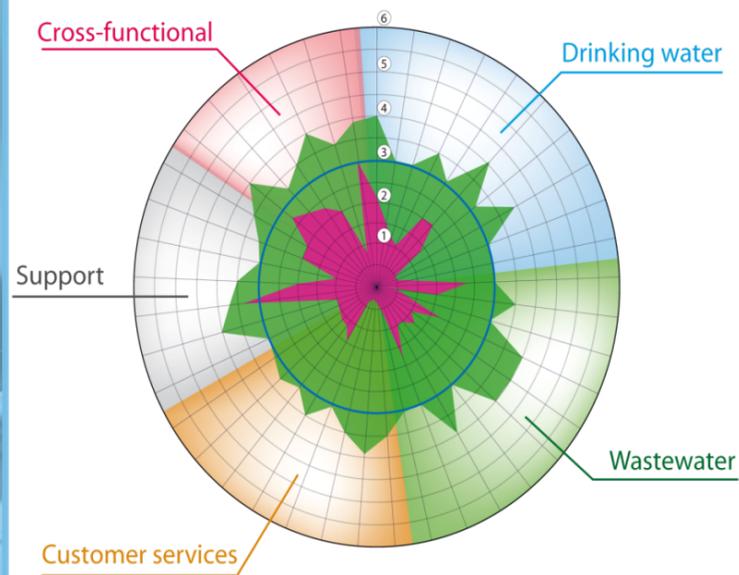
Starting level

Targeted level

x 42 Vision 360°

A target is set according to the initial action plan

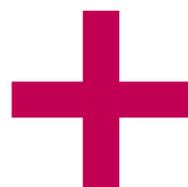
Level 3 : international standard



Principle: A 3-step method

Step 2: Implement the action plan

Process Officer



Process kit



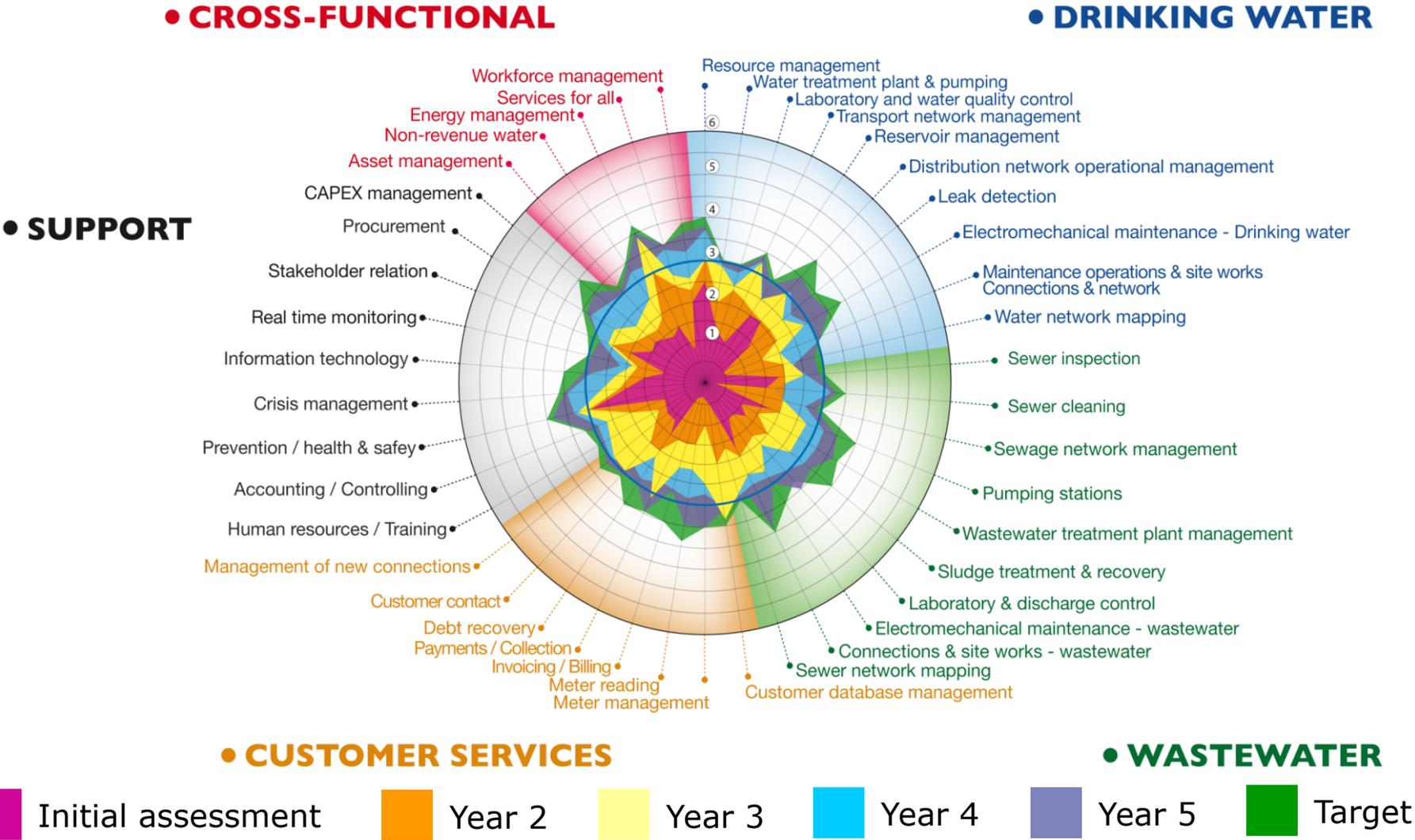
Process Datasheets



38 process kits for an accelerated implementation of the action plan (4 more kits under progress)

Principle: A 3-step method

Step 3: Follow-up of the evolution of maturity



WIKTI® in the world



Case study Algiers



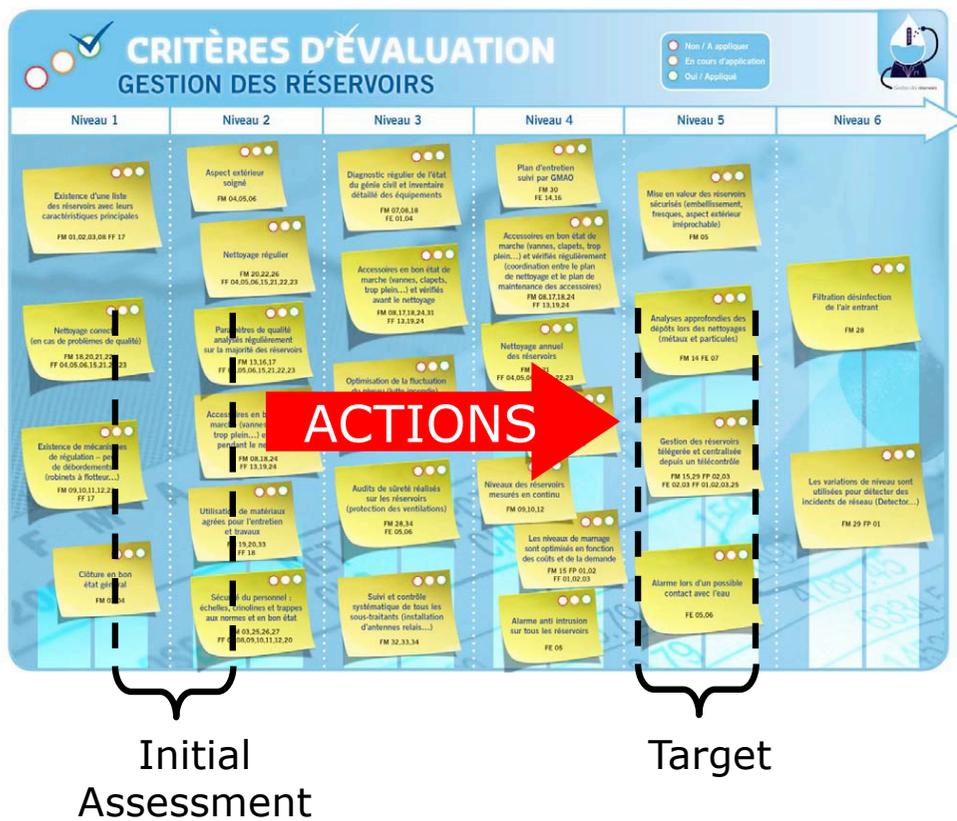
- To achieve ambitious technical objectives
- To transfer and develop all Knowledge required to take the company to a World Class level

**500 Million US\$ in 5
years**

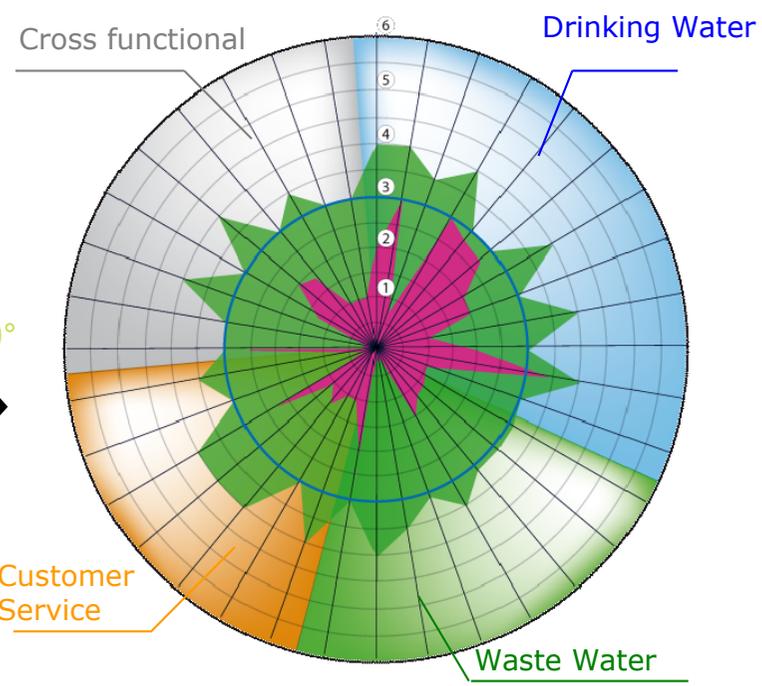
4 400 employees

Where do we start ?

Case study Algiers



x 38
Vision 360°



Case study Algiers

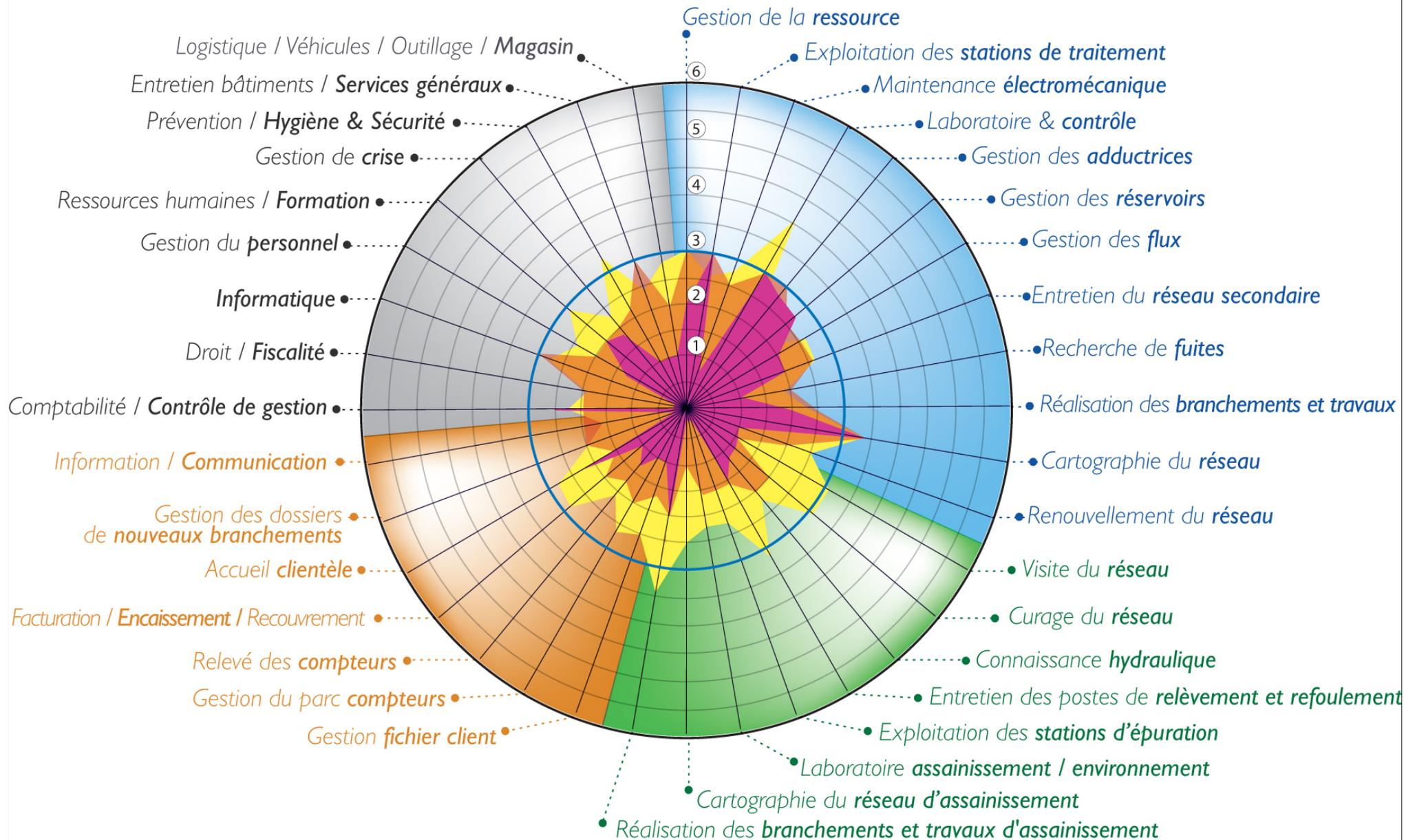


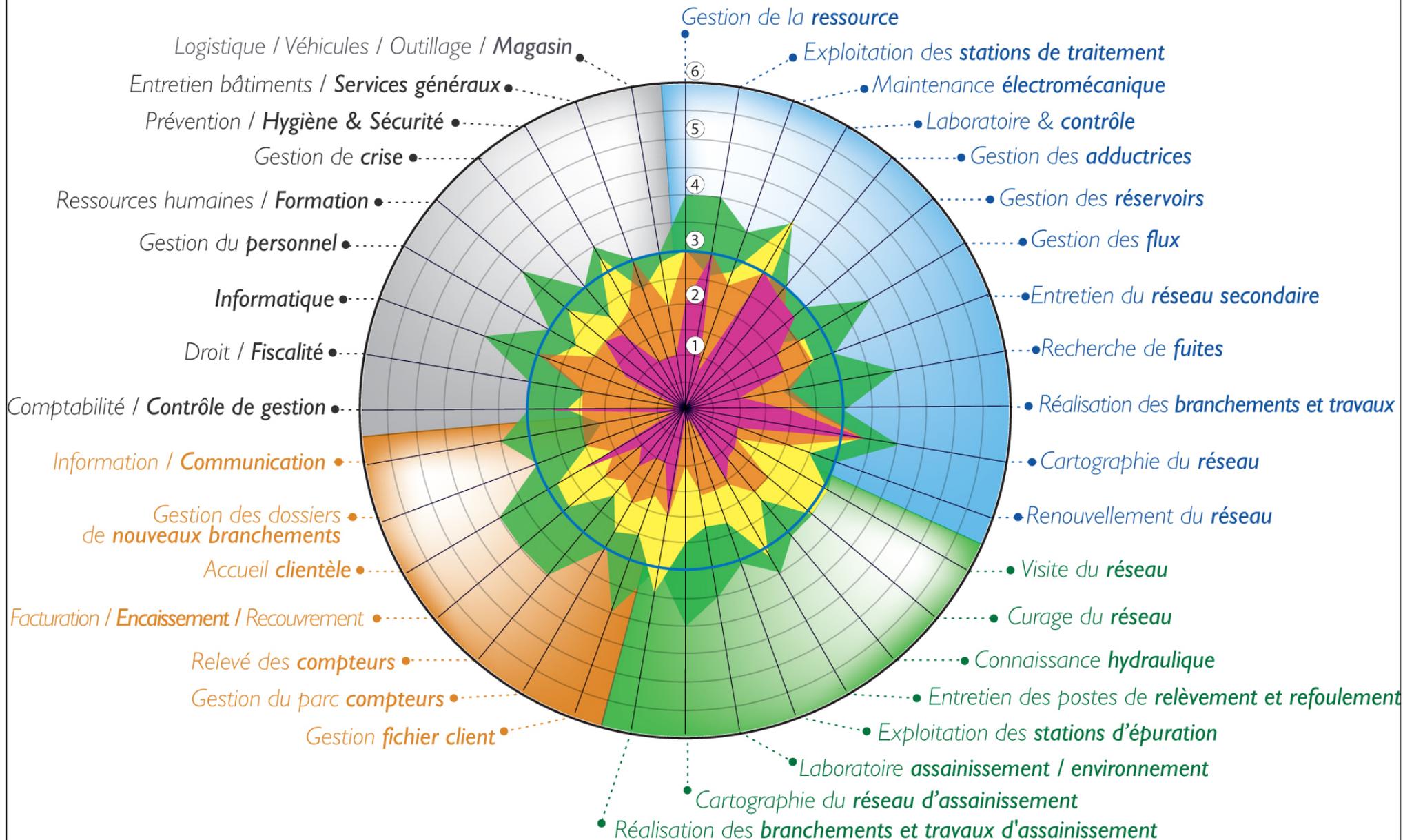
Every year:

- 800 days of Technical Assistance
- 25 000 days of training
- Key positions covered full time by Suez's experts and shadows









Case study Adelaide (Assessment and Action Plan)

18 processes assessed

20 workshops

> 600 criteria assessed

48 people involved across the business

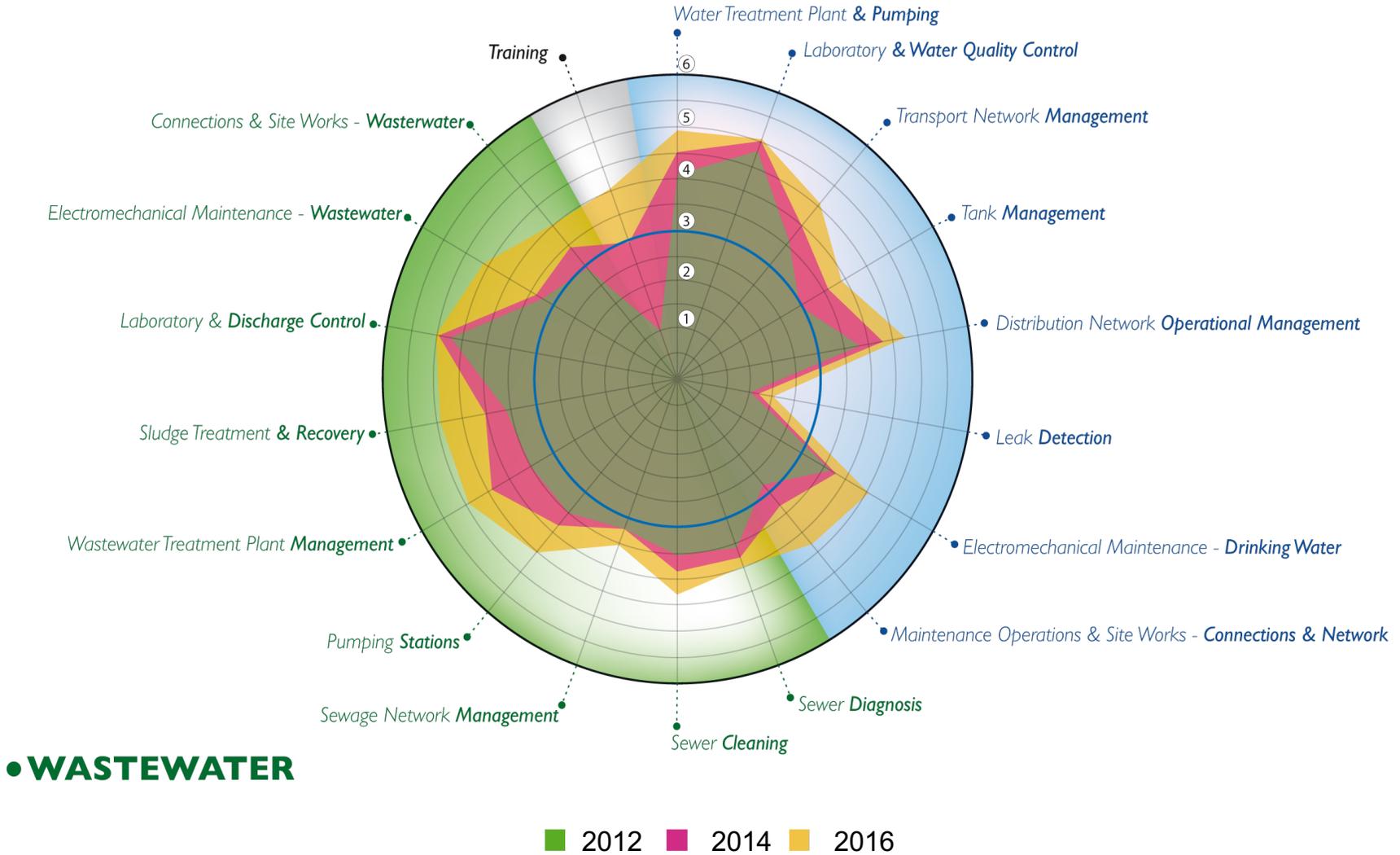
| Drinking Water | | Wastewater | | Customer Services | | Support | |
|---|--|---|---|-------------------|--|---------|--|
|  RESOURCE MANAGEMENT |  SEWER DIAGNOSIS |  CUSTOMER DATABASE MANAGEMENT |  HUMAN RESOURCES / TRAINING | | | | |
|  WATER TREATMENT PLANT & PUMPING |  SEWER CLEANING |  METER MANAGEMENT |  ACCOUNTING / CONTROLLING | | | | |
|  LABORATORY AND WATER QUALITY CONTROL |  SEWAGE NETWORK MANAGEMENT |  METER READING |  PREVENTION / HEALTH & SAFETY | | | | |
|  TRANSPORT NETWORK MANAGEMENT |  PUMPING STATIONS |  INVOICING / BILLING |  CRISIS MANAGEMENT | | | | |
|  RESERVOIR MANAGEMENT |  WASTEWATER TREATMENT PLANT MANAGEMENT |  PAYMENTS / COLLECTION |  INFORMATION TECHNOLOGY | | | | |
|  DISTRIBUTION NETWORK OPERATIONAL MANAGEMENT |  SLUDGE TREATMENT & RECOVERY |  DEBT RECOVERY |  REAL TIME MONITORING | | | | |
|  LEAK DETECTION |  LABORATORY & DISCHARGE CONTROL |  CUSTOMER CONTACT |  ASSET MANAGEMENT | | | | |
|  ELECTROMECHANICAL MAINTENANCE - DRINKING WATER |  ELECTROMECHANICAL MAINTENANCE - WASTEWATER |  MANAGEMENT OF NEW CONNECTIONS |  LOGISTICS / VEHICLES / TOOLS / WORKSHOP | | | | |
|  MAINTENANCE OPERATIONS & SITE WORKS - CONNECTIONS & NETWORK |  CONNECTIONS & SITE WORKS - WASTEWATER |  EXTERNAL COMMUNICATION |  BUILDING MAINTENANCE / GENERAL SERVICES | | | | |
|  WATER NETWORK MAPPING |  SEWER NETWORK MAPPING | | | | | | |

Actions are a part of employees' performance objectives

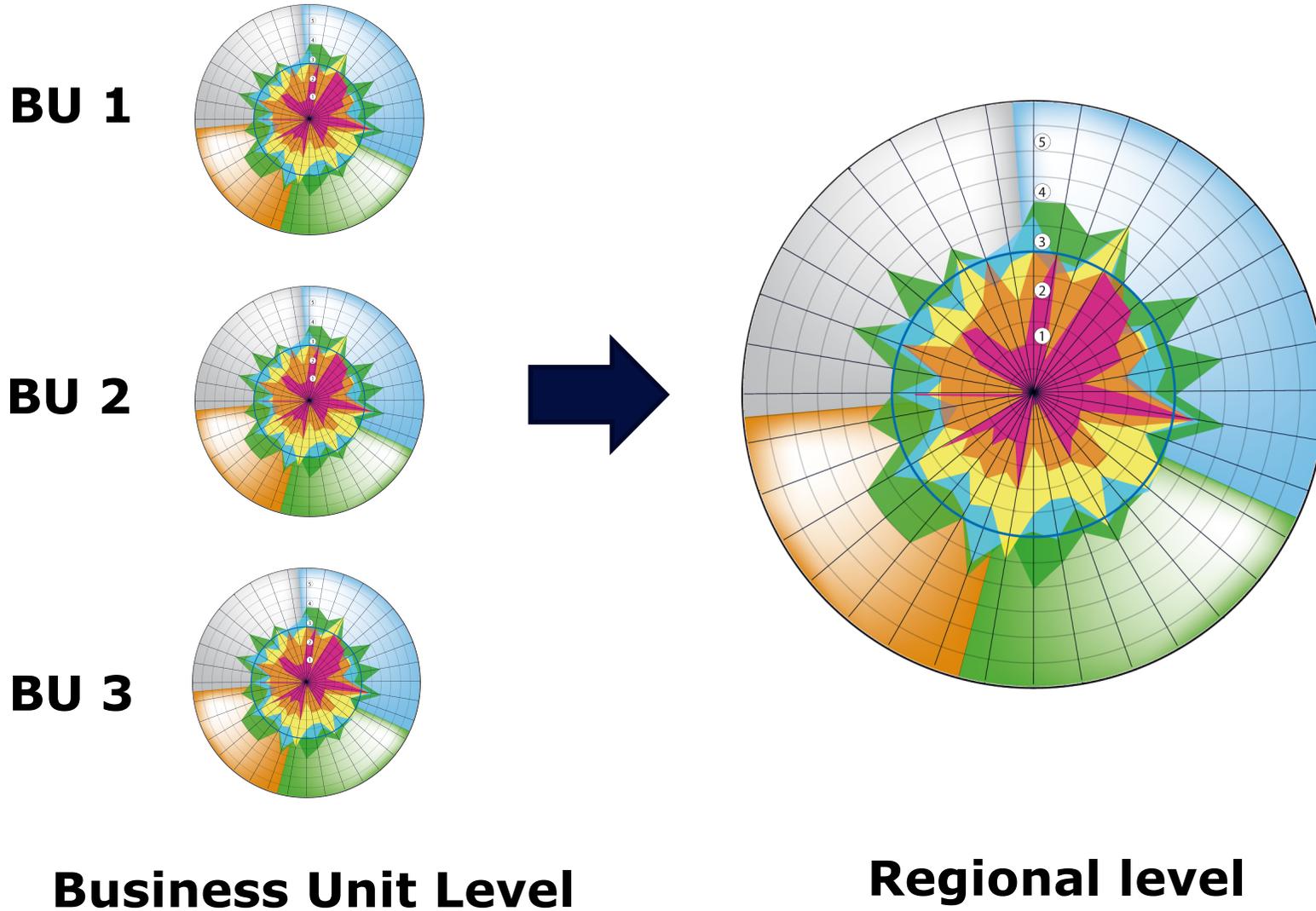
Case study Adelaide (Assessment and Action Plan)

● TRANSVERSAL

● DRINKING WATER



Case study Water France and China (Multiple assessments)



Case study Water France and China (Multiple assessments)

Domain: Drinking water production

Process: Reservoir Management

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---------|------|------|------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|
| JVs | CQ | CS | SY | TJ-TG | TZ | BD | CT | NC | PJ | QD | TJ-JY | XC | ZS | ZZ | SCIP | Spark |
| Level 1 | | | | | | | | | | | | | | | | |
| 1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1.2 | 1 | 0.75 | 1 | 0.75 | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5 |
| 1.3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1.4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Level 2 | | | | | | | | | | | | | | | | |
| 2.1 | 0.75 | 0.75 | 0.75 | 0.5 | 0.75 | 0.75 | 0.75 | 0.75 | 0.25 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| 2.2 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.75 | 0 | 0.25 | 0.75 | 0.75 | 0.75 | 0.25 | 0.25 | 0.25 | 0.25 | 0 |
| 2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.4 | 0.75 | 0.75 | 0.5 | 0.5 | 0.5 | 0.75 | 0 | 0.5 | 0.5 | 0.75 | 0.75 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 2.5 | 0.25 | 0.75 | 0.75 | 0.5 | 0.5 | 0.75 | 0.5 | 0.5 | 0.5 | 0.5 | 0.75 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 2.6 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Level 3 | | | | | | | | | | | | | | | | |
| 3.1 | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.5 | 0.25 | 0.25 | 0 | 0.75 | 0.75 | 0 | 0.75 | 0.25 |
| 3.2 | 0.25 | 0 | 0.25 | 0.25 | 0.25 | 0.75 | 0 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| 3.3 | 0.25 | 0.25 | 0.25 | 0 | 0.25 | 0 | 0 | 0 | 0.25 | 0.25 | 0.5 | 0.5 | 0.5 | 0 | 0.25 | 0.25 |
| 3.4 | 0.75 | 0.75 | 0.5 | 0.5 | 0.75 | 0.75 | 0.5 | 0.25 | 0.25 | 0.5 | 0.25 | 0.25 | 0.75 | 0.25 | 0.5 | 0.5 |
| 3.5 | 0.5 | 0.5 | 0.25 | 0.25 | 0.5 | 0.5 | 0.5 | 0.5 | 0.25 | 0.5 | 0.75 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

• L 2 – basic and critical;
 • commonly weak;
 • Opex focused;

Wikti_Evaluation/Evaluation_20160616_115...

Wikti_ValiderEvaluationCWO > Wikti_Evaluation/Evaluation_20...

Wikti_ValiderEvaluationCWO

Campaign Label Campaign 2016

Organisational entity TourCB21

Business line Information Technology

Overall Rating 3.08

Level 1

Score

0.50

CWO

Validated

4/5

1.1 There are work stations on the main sites, they are listed in an inventory. The computers are on a local network and share basic resources (files, printers, etc.)



N/A 0 0,25 0,5 0,75 1

Yes



1.2 The existing applications covering the company's needs are known and listed (mapping)



N/A 0 0,25 0,5 0,75 1

Yes



1.3 An Information Systems department (ISD) is responsible for most IT staff and its functions are specialised



N/A 0 0,25 0,5 0,75 1

No



1.4 The ISD notes the requirements expressed by the functional departments



N/A 0 0,25 0,5 0,75 1

Yes



1.5 The company is familiar with the supplier market for the main products and services, it issues calls for tender and enters into formal contracts with suppliers



N/A 0 0,25 0,5 0,75 1

Yes





Wikti_DefinirObjectifsEtActions

Campaign Label Campaign 2016

Organisational entity TourCB21

Business line Information Technology

Overall Rating 3.08

Target Level 3.08

Level 1

Score 0.50

Goal 0.50

Actions 0

1.1 There are work stations on the main sites, they are listed in an inventory. The computers are on a local network and share basic resources (files, printers, etc.)



0,75



Action



1.2 The existing applications covering the company's needs are known and listed (mapping)



0,5



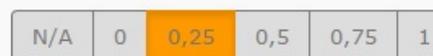
Action



1.3 An Information Systems department (ISD) is responsible for most IT staff and its functions are specialised



0,25



Action



1.4 The ISD notes the requirements expressed by the functional departments



0



Action



1.5 The company is familiar with the supplier market for the main products and services, it issues calls for tender and enters into formal contracts with suppliers



1



Action





Wikti_Action/Action_20160617114340

Wikti_Realisation_Action > **Wikti_Action/Action_20160617114...**

Wikti_Realisation_Action

Business line

Informatique

Criterion

1.3 an Information Systems departement (ISD) is responsible for the most IT staff and its functions are specialized

Action name

The are specialized functions

Progress (%)

Comment

✕ Cancel

✓ Confirm

III. Use of WIKTI in Consulting Services

*Gary Moys,
Country Manager
Myanmar*



SUMMARY

Overview

Case Studies

- **Myanmar MCDC**
- **Sri Lanka NWSDB**
- **Cambodia PPWSA**

**Comparison of Maturity/
Performance**

Use of WIKTI in Consulting Assignments

Diagnostic of Utility

- Utility Organization
- Utility Performance and Processes

Improvement Action Plans

- Overall organization of the IAPs and Institutional Strengthening

Guiding & Mapping Implementation

- Overall utility strengthening
- Specific contracts
- Knowledge Management

Evaluation & Strategies

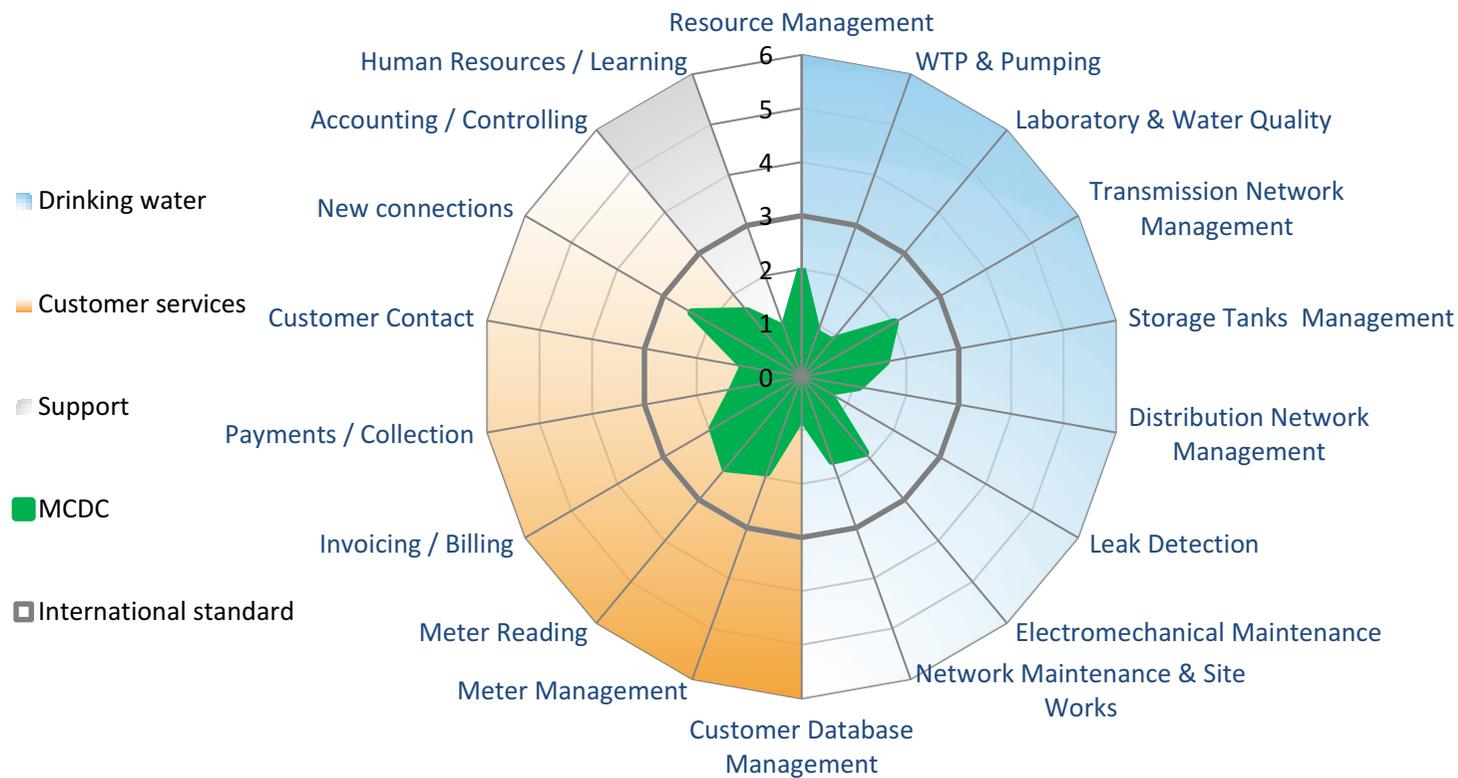
- Utility Evaluation



Example 1: MCDC, Mandalay, Myanmar 2014-15

Diagnostic of Utility

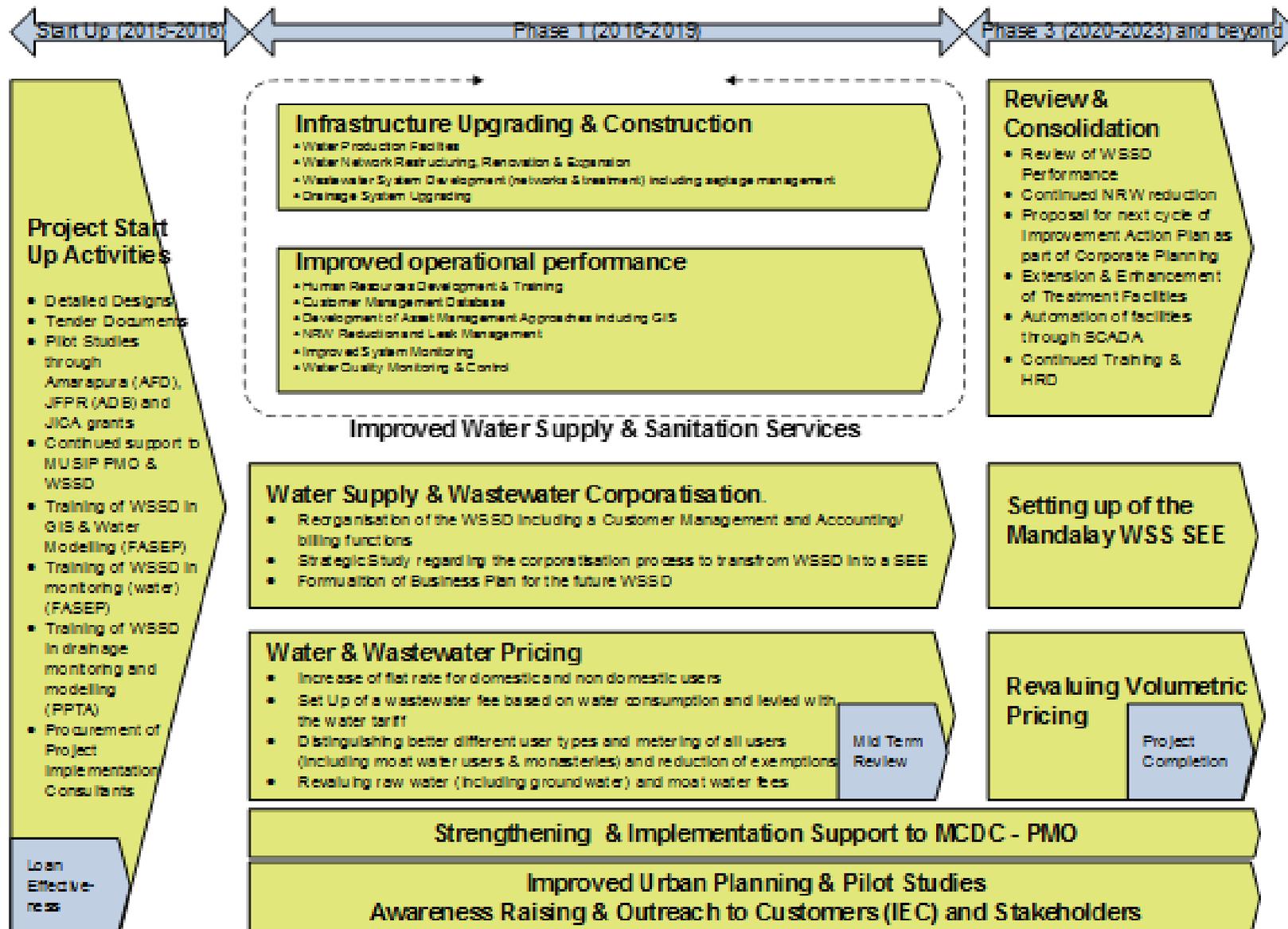
- Very “immature” organization largely due to the closure of Myanmar and the lack of exposure of MCDC to modern utility operations
- Decided only relevant to study 19 processes, not including wastewater nor cross cutting processes.
- Average score not surprisingly very low – 1.5 average and many processes significantly lower



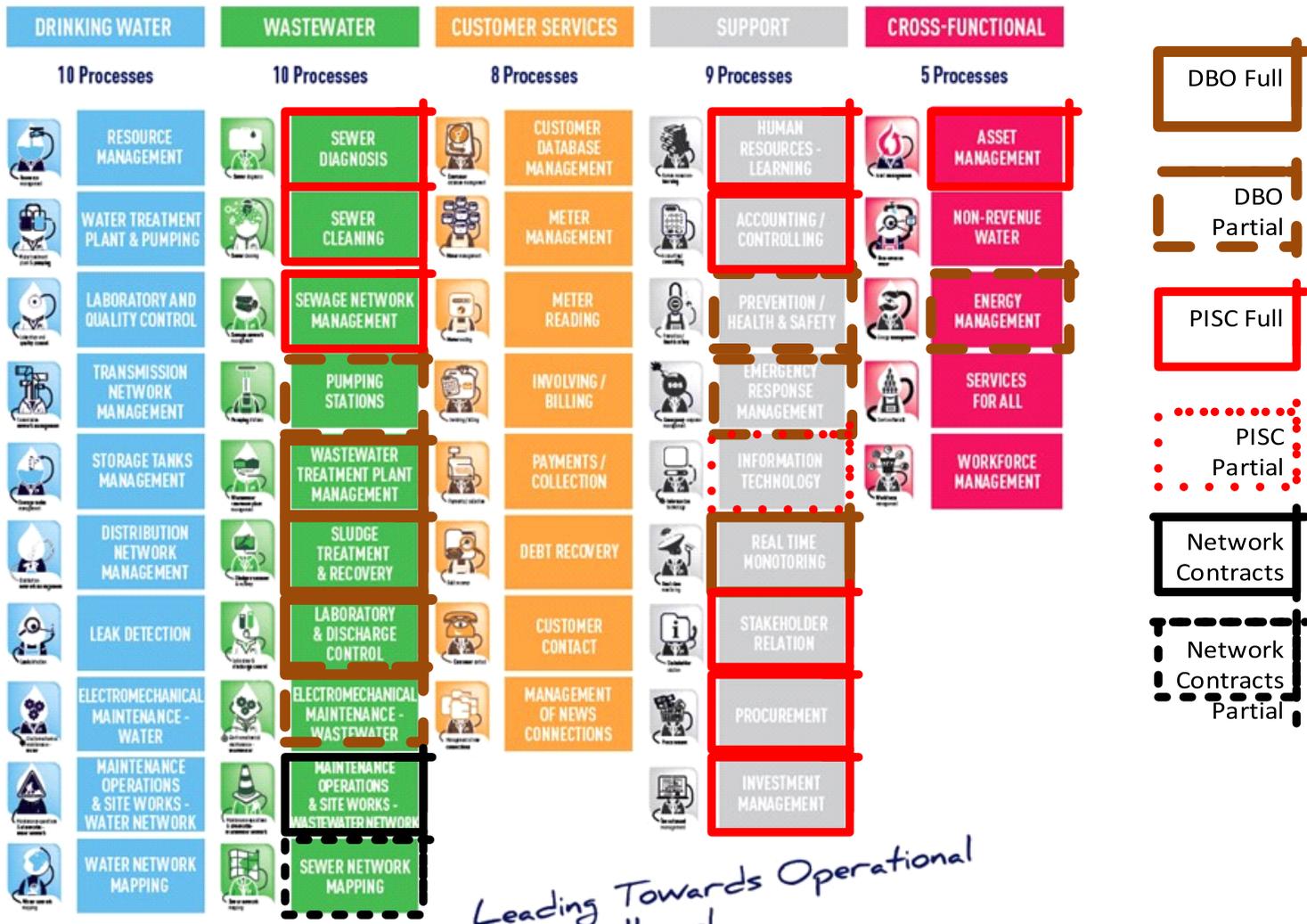
For such a utility WIKTI can be used as a guide for mapping and following the development of the utility

MCDC: Road Map for MCDC development

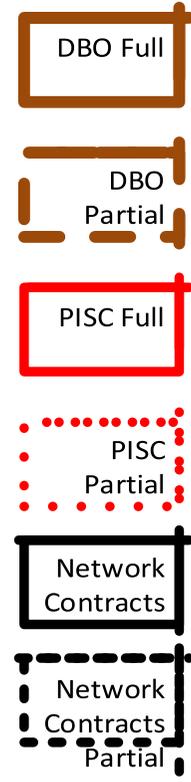
Outline of MUSIP 1 Implementation & Road Maps



Mapping of Waste Water Technical Assistance (essentially MUSIP ADB)



Leading Towards Operational Excellence!



Mapping of Water Supply Technical Assistance (a variety of actors)

Vitens & Evides
WOP

DB Full

DB Partial

PBMC Full

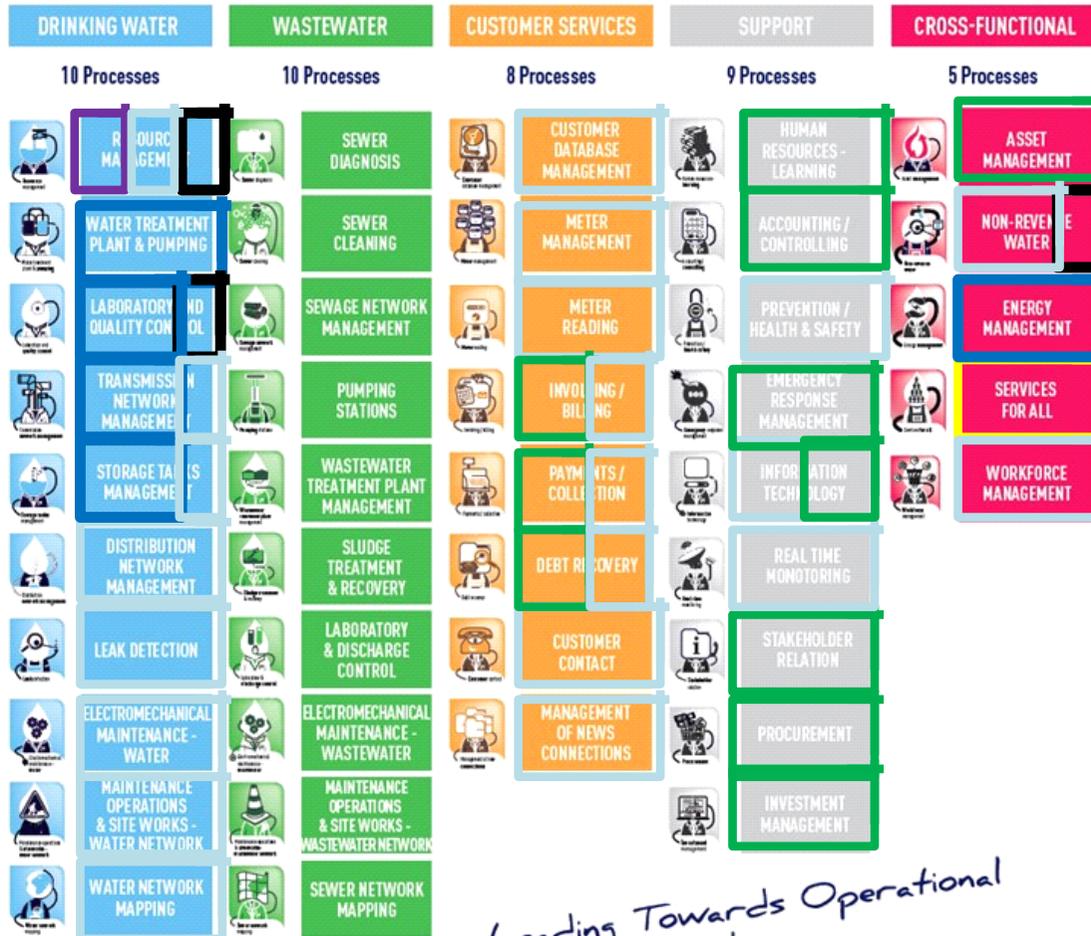
PBMC Partial

PISC AFD Full

PISC AFD Partial

Amarapura + EU Grant

Kitakyushu



Leading Towards Operational Excellence!

Scope of PBMC

WSSD AFD PISC

Example 2: NWSDB, Sri Lanka

Undertaken as part of CDTA 8835

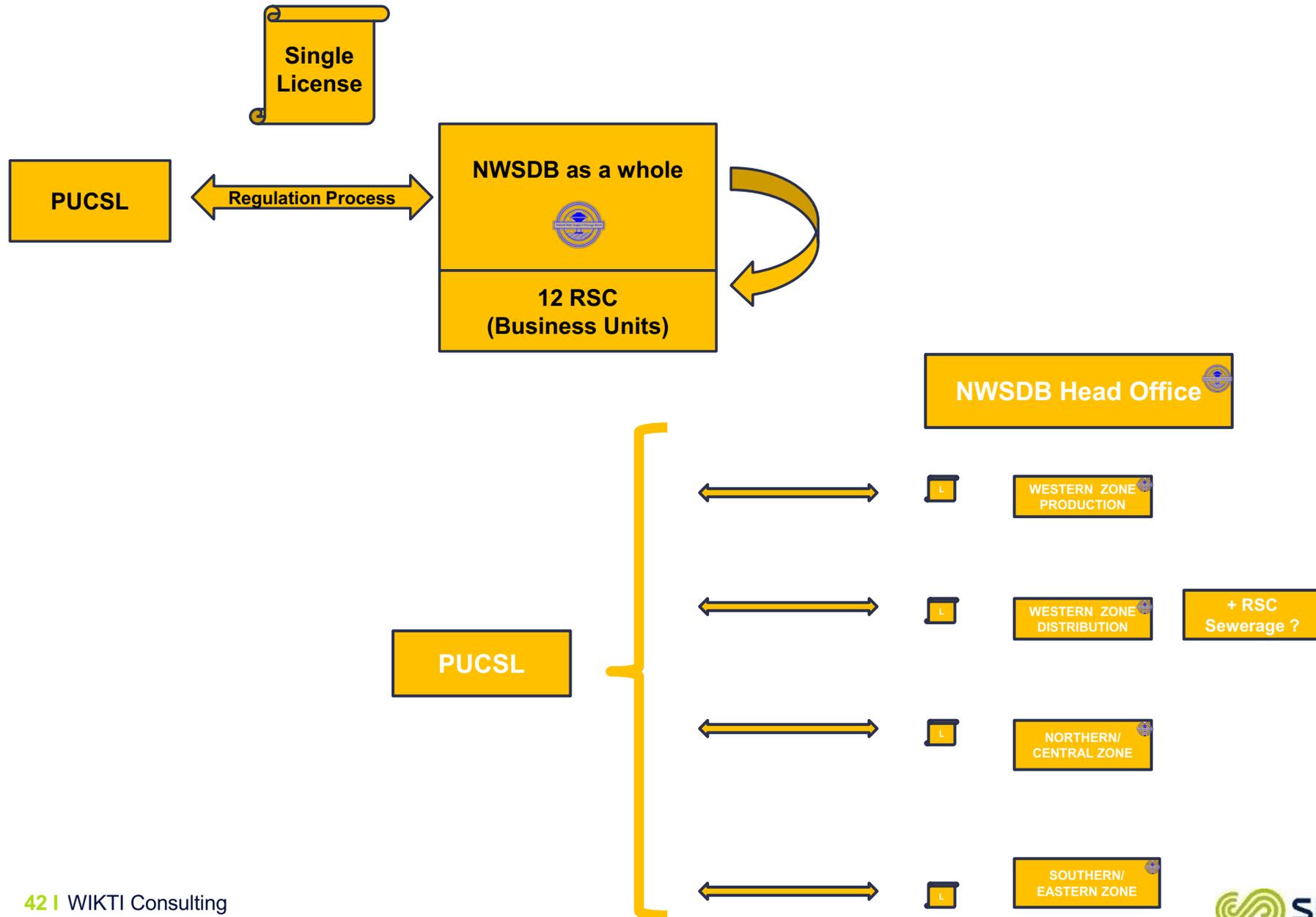
- Setting Up of Independent Regulator of NWSDB
- Enhanced NWSDB Institutional Structure (including NRW, Asset Management, ...) and reinforced autonomy
- Enhanced P&D function and development of E&S Division

Scope

- Link the analysis to the setting up of the regulation scheme for the NWSDB - readying the NWSDB for regulation
- All of the distributed operations of the NWSDB – the so-called Regional Support Centres. Covering water supply services only within the three major zones of NWSDB
 - Western Zone (4 RSCs)
 - South Eastern Zone (4 RSCs)
 - Northern Central Zone (4 RSCs)
- Wastewater evaluated for the : wastewater operations elsewhere considered to be insufficiently developed to warrant application.



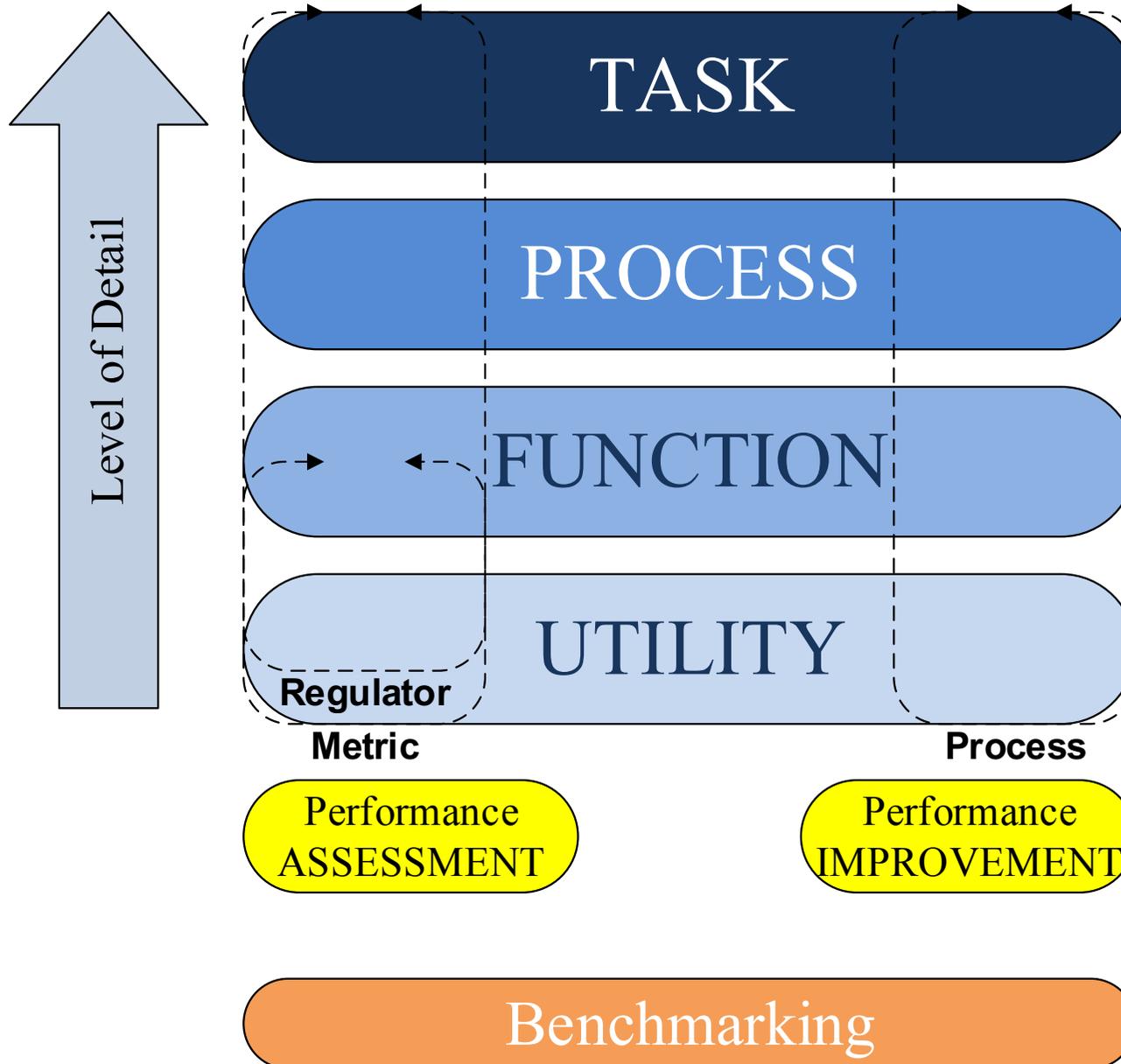
Regulation of NWSDB – Two Phases



Proposed Strategy for NWSDB

- NWSDB readies itself for regulation by beginning of 2018 with continued assistance of ADB
 - Initiates short term IAPs
 - Business Planning (per RSC, per Zone and as whole) inc Capital Investment Plans
 - Reorganisation in response to regulation
- Phase 1: Initial regulation with provisional license of NWSDB as a whole permitting a transparent tariff evaluation and setting by end of 2018
- Phase 2A: Regulation of Zones as they become ready permitting tariff evaluation and setting beyond 2020 with objective to achieve full regulation by 2022
- Phase 2B: Regulation extended to local authorities, CBOs (or collections thereof) and possible other service providers in the water sector.

Readying the NWSDB for regulation

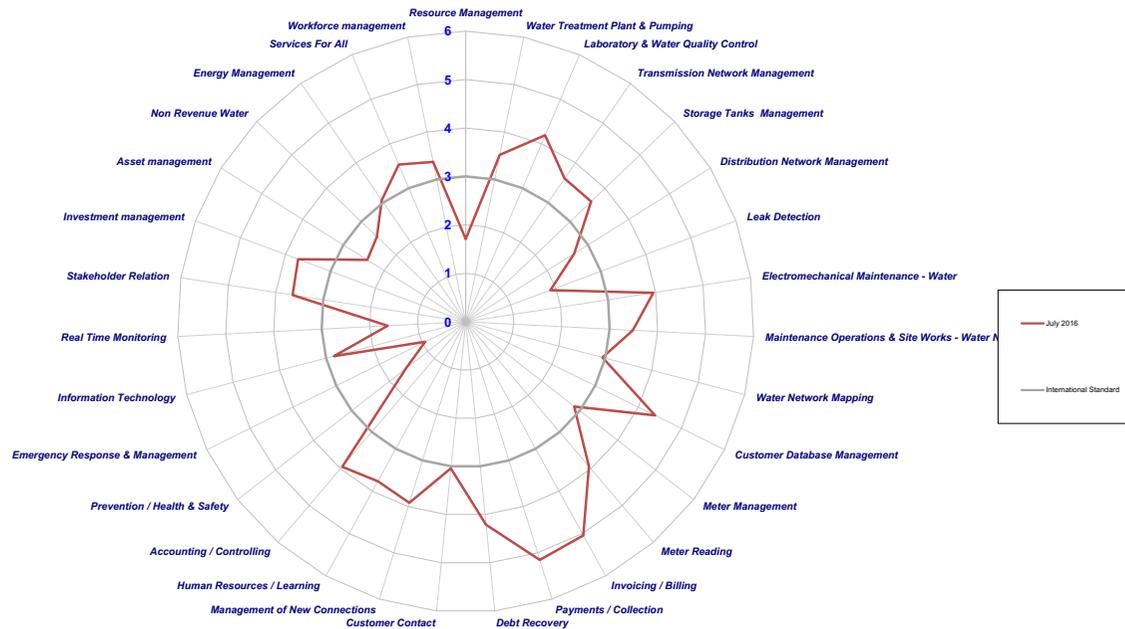
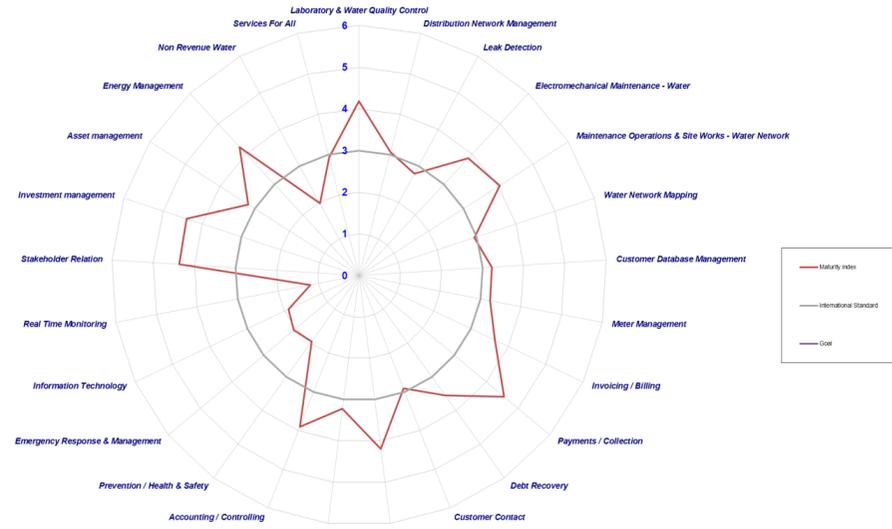
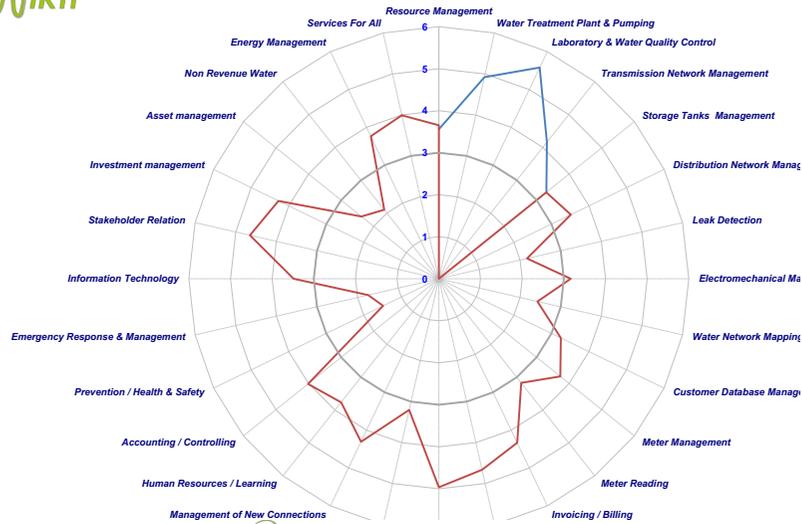


Pilot undertaken in North Central RSC as part of Inception Period

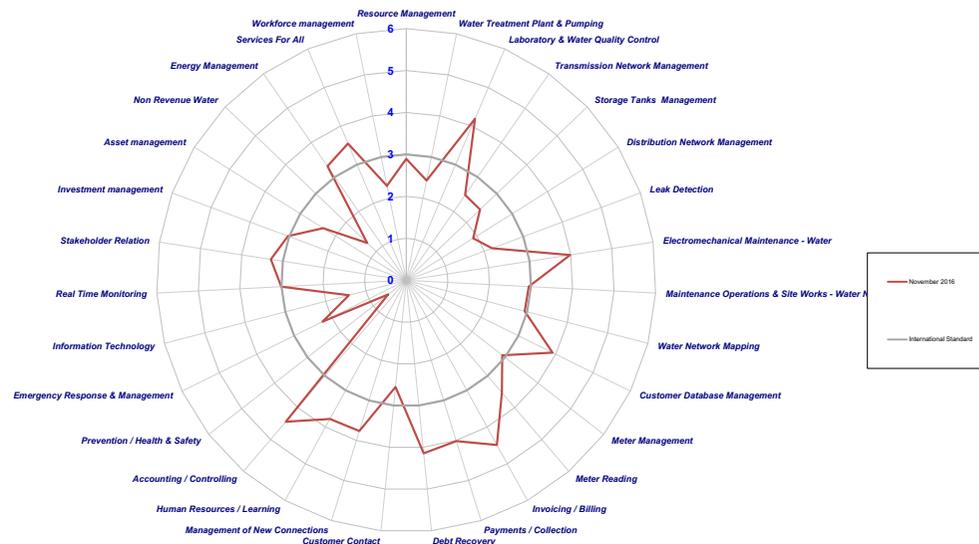
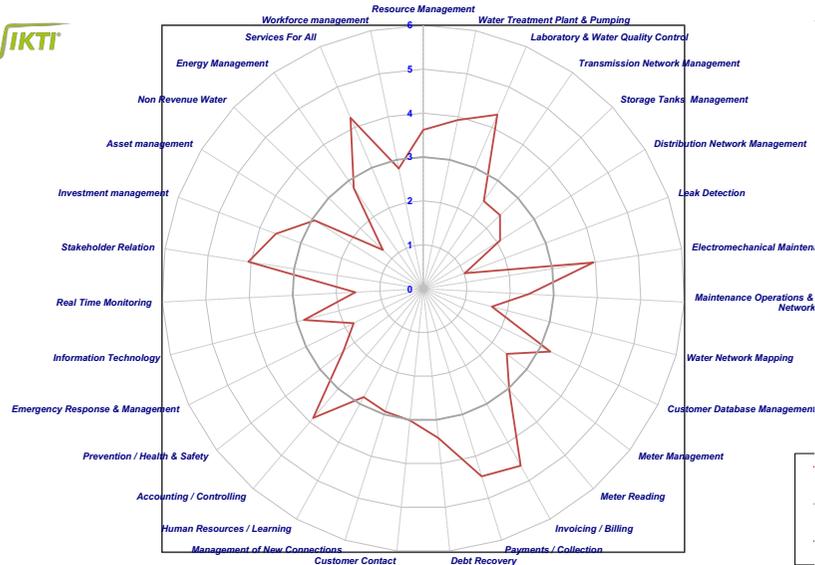
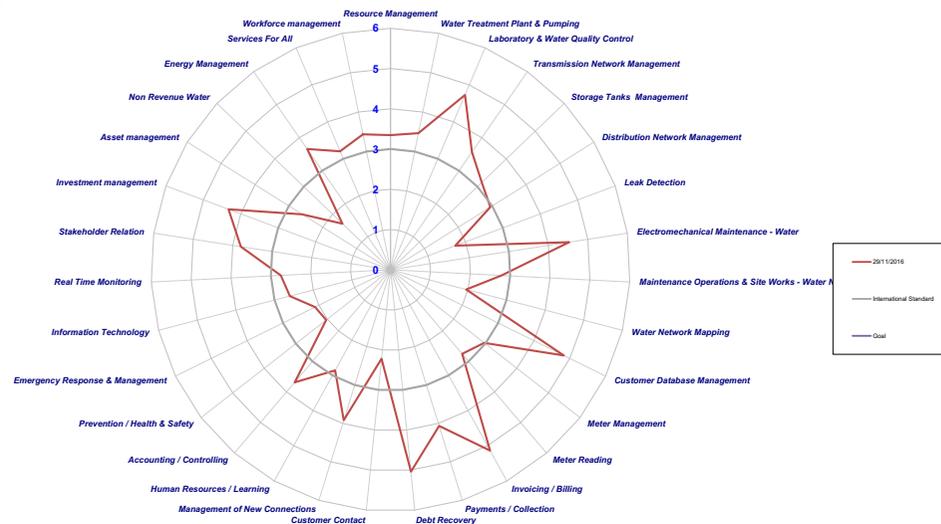
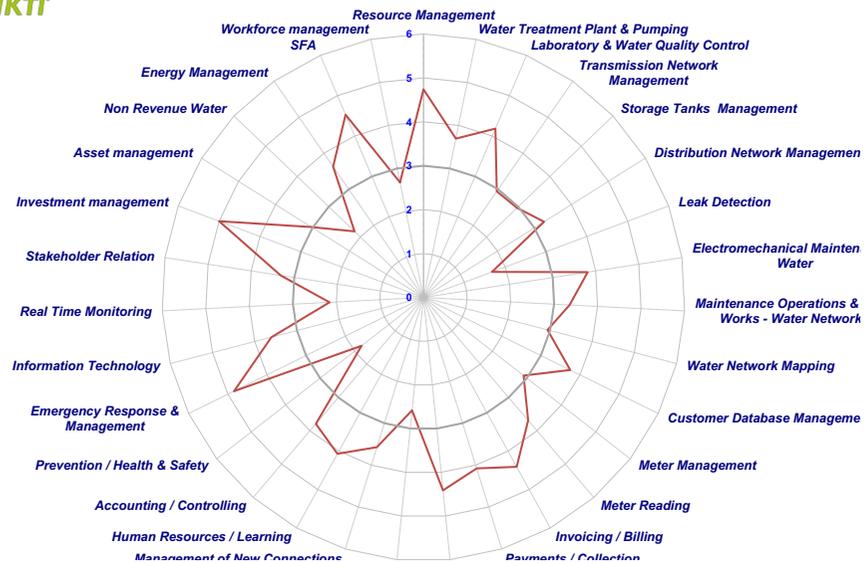
- Initial briefing and data collection ½ day
- WIKTI Evaluation 3 days
- Debriefing with RSC Senior Management (DGM/AGM) + follow up action plan 1 day
- Important to have participation of head office liaison and RSC senior staff
- Team of 2-3 experts ideal to undertake assessment (especially if language difficulties)



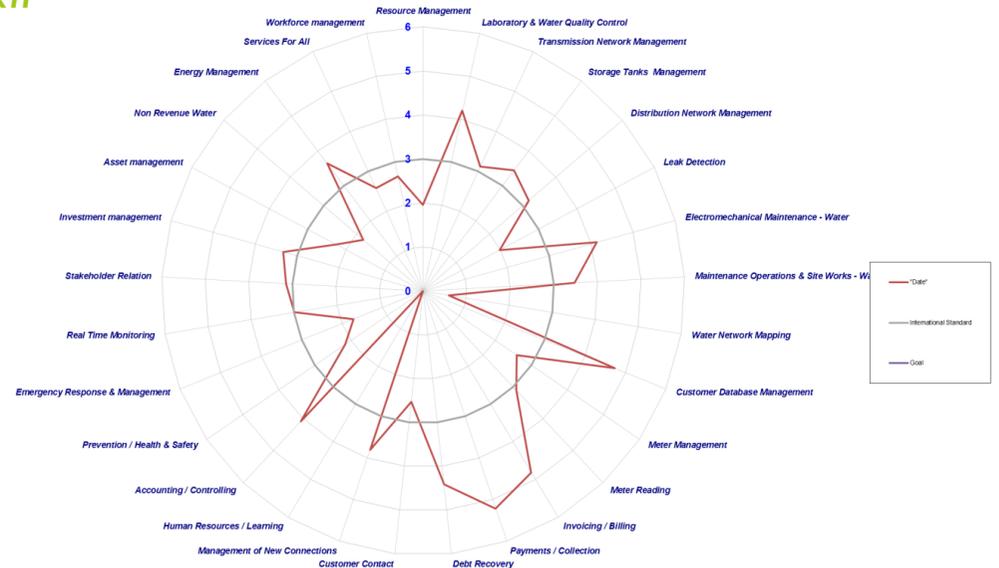
WIKTI Western Zone



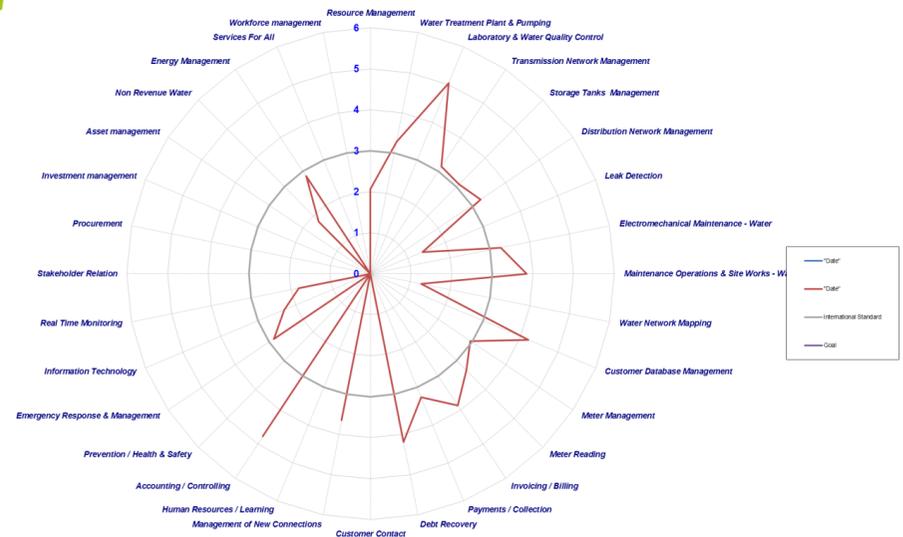
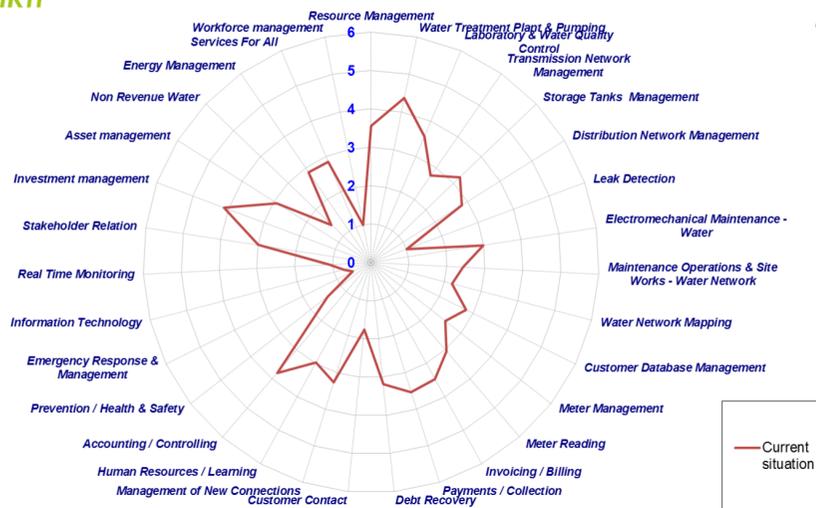
WIKTI South Eastern Zone



WIKTI North Central Zone



Current situation



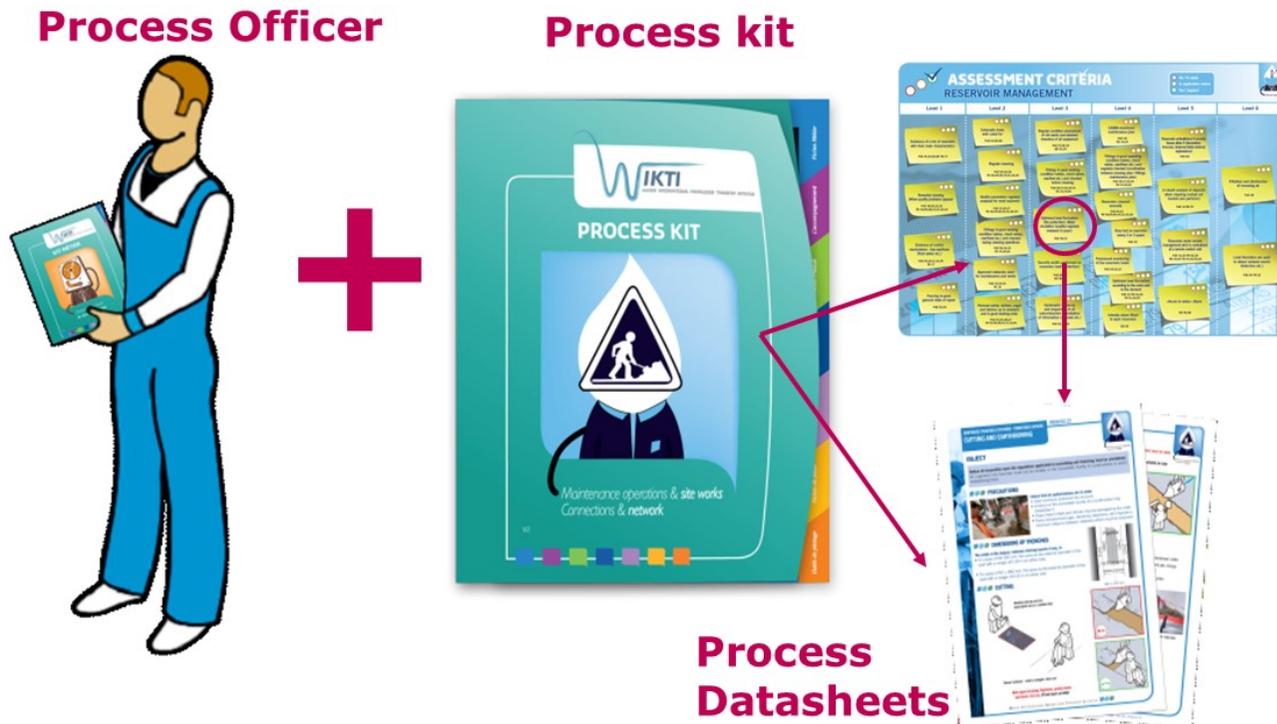
Overall Summary & Business Priorities

| WIKTI | North Central | Sabagaramuwa | Uva | North Western | Northern | Western Central | Central | Eastern | Western North | Western South | Southern | NW/SDB |
|----------------|---------------|--------------|------|---------------|----------|-----------------|---------|---------|---------------|---------------|----------|--------|
| NOTE OF THE BU | 2.62 | 2.96 | 2.98 | 3.11 | 3.13 | 3.21 | 3.21 | 3.29 | 3.28 | 3.42 | 3.47 | 3.15 |
| Min | 0.54 | 1.02 | 0.55 | 1.27 | 0.60 | 1.20 | 1.22 | 1.66 | 0.94 | 1.49 | 1.67 | 1.11 |
| Max | 4.38 | 4.61 | 4.49 | 5.04 | 5.22 | 4.56 | 4.74 | 5.14 | 5.15 | 4.96 | 5.00 | 4.84 |

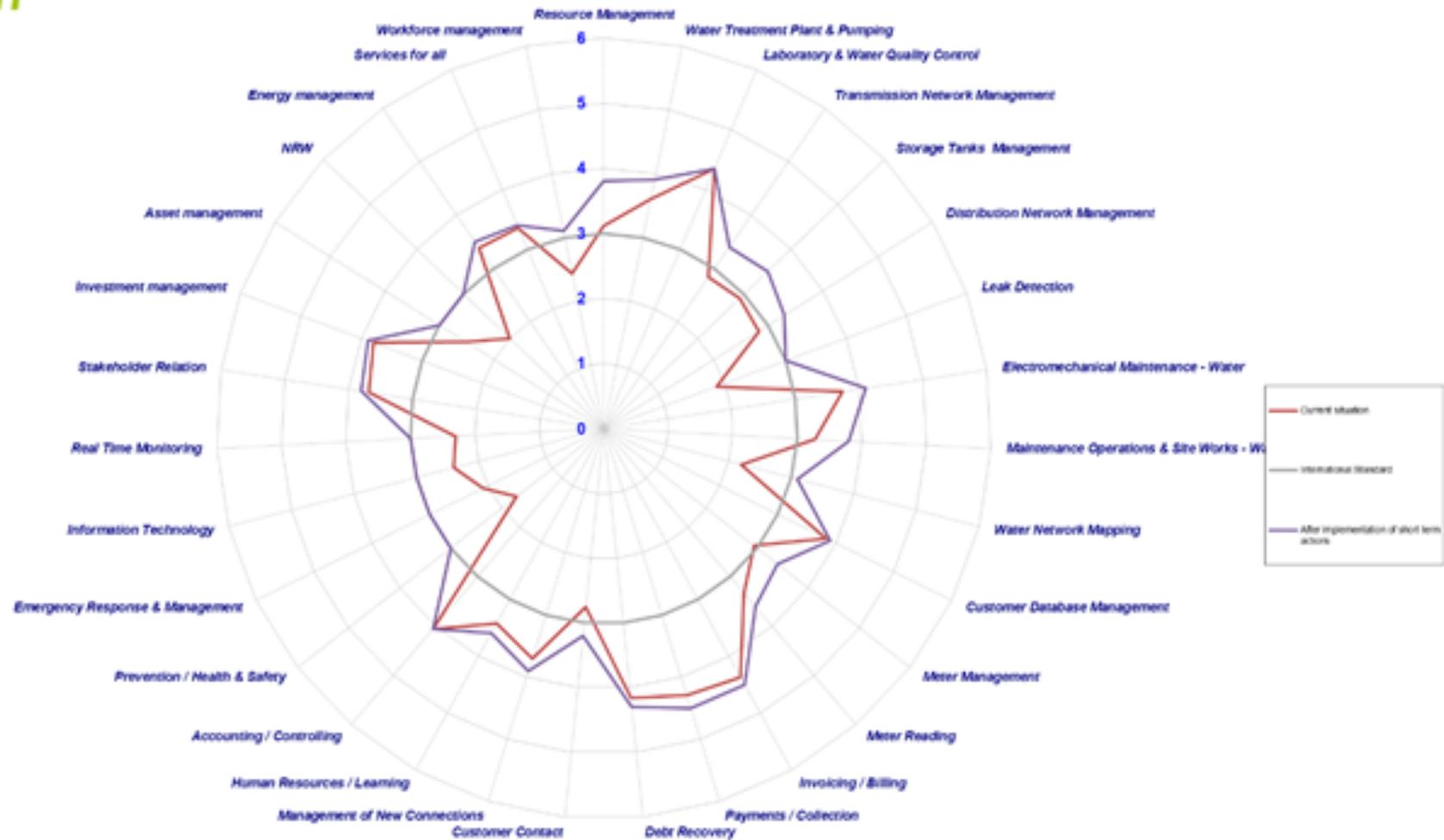
| | Priority 1 | Priority 2 | Priority 3 |
|-------------------|---------------------------------|---------------------------------|---------------------|
| Drinking water | Leak Detection | | |
| | Water Network Mapping | | |
| | | Distribution Network Management | |
| | | Transmission Network Management | |
| | | Storage Tank Management | |
| | | | Resource Management |
| Customer services | | Customer Contact | |
| | | Meter Management | |
| Support | Prevention / Health & Safety | | |
| | Emergency Response & Management | | |
| | | Real Time Monitoring | |
| | Information Technology | | |
| Cross functional | NRW | | |
| | Workforce management | | |
| | | Asset management | |

Next Steps 2017

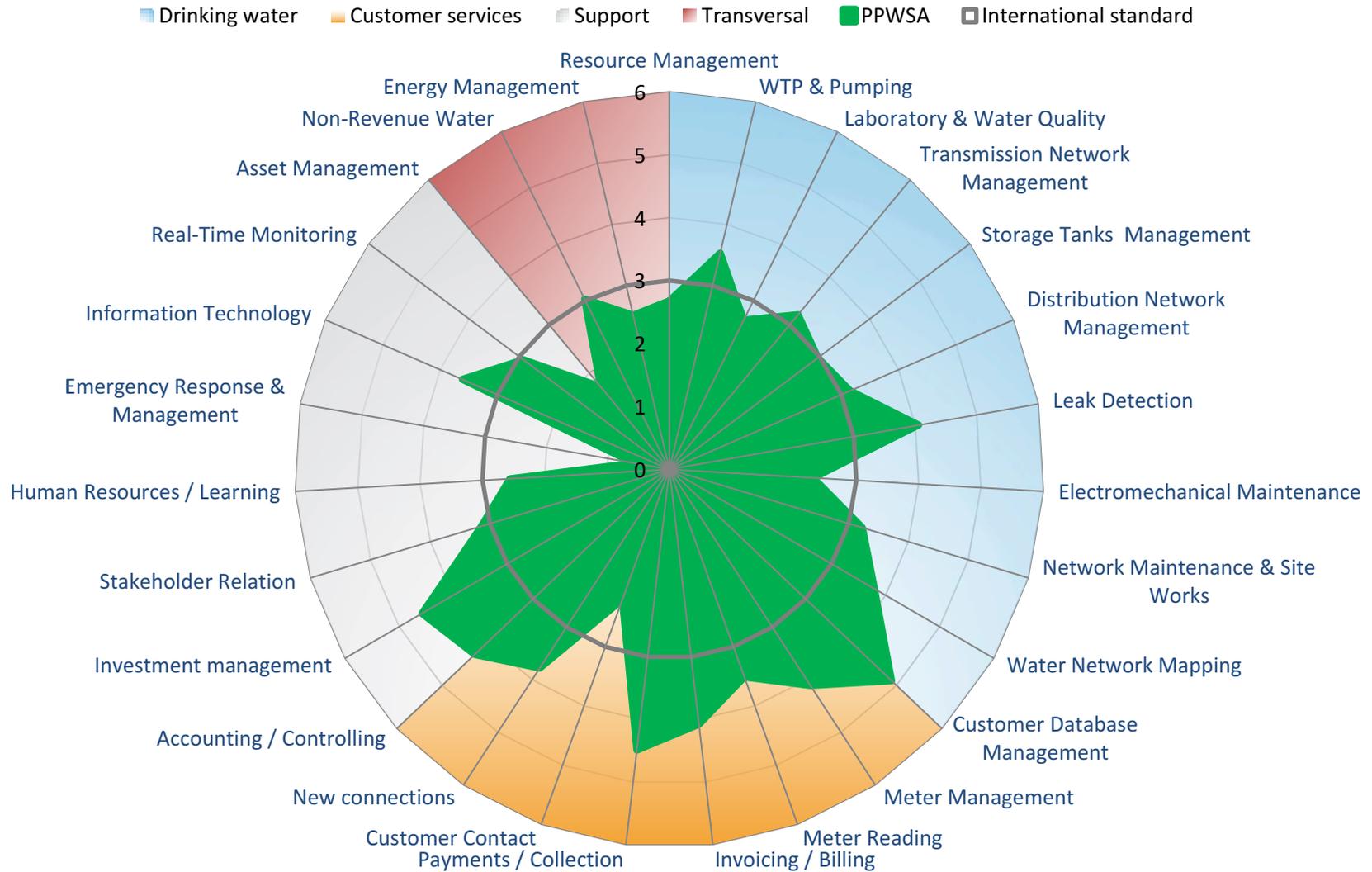
- Formation of thematic working groups within existing departments reporting directly to DGM/AGM and working with CDTA Team from end of 2016 through 2017
- Piloting approach in two RSCs (Southern and North Central)
- Key officer to be identified at Zonal Level to coordinate and follow IAPs
- Reinforced training and technical assistance to RSCs of key BPs



Average Maturity & Projected Maturity after completion of short term IAP



Example 3: PPWSA Cambodia



PPWSA, Cambodia

Part of Masterplan Study of PPWSA

- Conventional SWOT Analysis
- WIKTI Analysis covering 27 processes

Guiding & Mapping Implementation

- Overall Score 3.3 for PPWSA
- For processes affecting NRW score is higher reflecting emphasis of PPWSA on this aspect
- Action required is in Asset Management (currently doesn't affect very significantly NRW as much of network is recent; but will have an impact as network ages)

Improvement Action Plans

- Development of short term IAP covering 10 major measures
- Identification of a “catalogue” of other recommendations

| Level | Activities |
|--|---|
| International leadership (grade > 4) | <ul style="list-style-type: none"> ▪ customer database management ▪ payments & bill collection ▪ accounting / controlling ▪ investment management |
| International performance (grade ≈ 4) | <ul style="list-style-type: none"> ▪ water production ▪ leak detection ▪ water network mapping ▪ meter management ▪ meter reading ▪ invoicing & billing ▪ management of new connections ▪ information technology (IT) |
| International standard (grade ≈ 3) | <ul style="list-style-type: none"> ▪ transmission network management ▪ storage tanks management ▪ distribution network management ▪ network maintenance & site works ▪ stakeholder relation ▪ real-time monitoring ▪ non-revenue water |
| Room for improvement (grade ≈ 2-3) | <ul style="list-style-type: none"> ▪ water resource management ▪ laboratory & water quality control ▪ electromechanical maintenance ▪ customer contact ▪ human resources / learning ▪ energy management |
| Action needed (grade ≈ 1) | <ul style="list-style-type: none"> ▪ emergency response & management ▪ equipment renewal management |

Overall Score 3.3 confirming PPWSA's position as an internationally recognised water operator

Comparison of WIKTI Scores

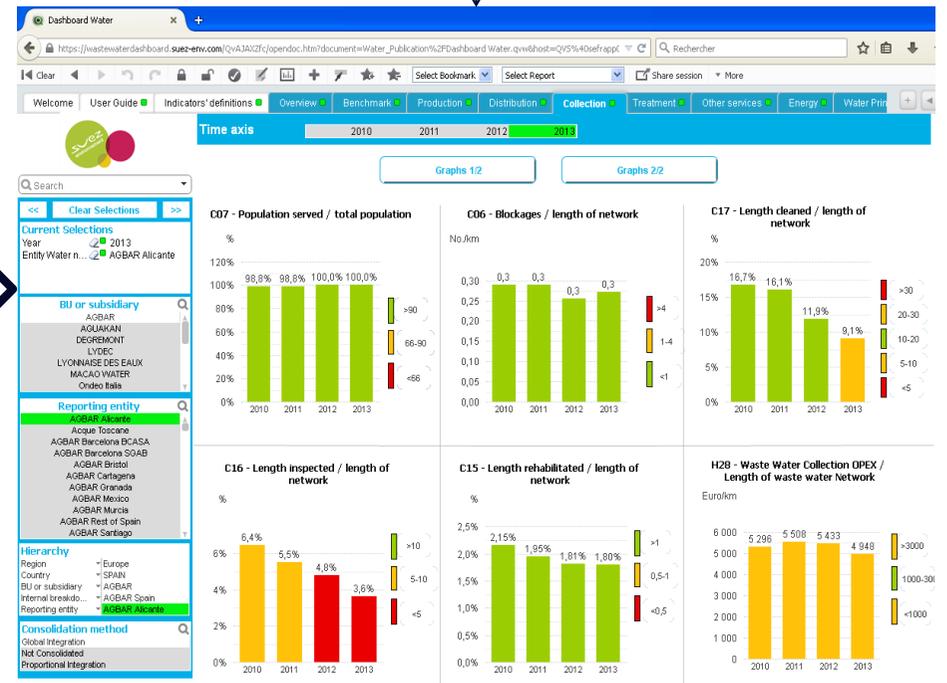
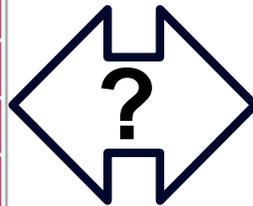
- At first sight WIKTI scores for NWSDB and PPWSA are not so different (3.2 as compared to 3.3).
- Indeed if we compare Greater Colombo/Western Province to PPWSA the WIKTI scores are almost identical
- However, Western Province has a far higher NRW (36% if we look at the whole production distribution system) compared to less than 10% for PPWSA
- Obviously this can relate clearly to the age of the network but can WIKTI reveal other factors which can also help us in improving utilities.

Tools

WIKTI

Water Dashboard

| MÉTIERS | | | | ACTIONS |
|---|---|--|---|---|
| EAU POTABLE | ASSAINISSEMENT | CLIENTÈLE | SUPPORT | TRANSVERSE |
| 10 Métiers | 10 Métiers | 8 Métiers | 9 Métiers | 5 Actions |
| <ul style="list-style-type: none"> GESTION DE LA RESSOURCE STATION DE PRODUCTION & POMPAGE LABORATOIRE & CONTRÔLE QUALITÉ EAU GESTION DES ADDUCTICES GESTION DES RÉSERVOIRS EXPLOITATION DU RÉSEAU DE DISTRIBUTION RECHERCHE DE FUITES MAINTENANCE ÉLECTROMÉCANIQUE INTERVENTIONS & TRAVAUX SUR BRANCHEMENT & RÉSEAU CARTOGRAPHIE DU RÉSEAU EAU | <ul style="list-style-type: none"> DIAGNOSTIC DU RÉSEAU CURAGE DU RÉSEAU EXPLOITATION DU RÉSEAU D'ASSAINISSEMENT POSTES DE RELEVEMENT EXPLOITATION DES STATIONS D'ÉPURATION TRAITEMENT & VALORISATION DES BOUES LABORATOIRE & CONTRÔLE DES REJETS MAINTENANCE ÉLECTROMÉCANIQUE ASSAINISSEMENT RÉALISATION DES BRANCHEMENTS & TRAVAUX ASSAINISSEMENT CARTOGRAPHIE DU RÉSEAU D'ASSAINISSEMENT | <ul style="list-style-type: none"> GESTION DE LA BASE DE DONNÉES CLIENTÈLE GESTION DU PARC COMPTEURS RELEVÉ DES COMPTEURS FACTURATION ENCAISSEMENT RECOURVEMENT CONTACT CLIENT GESTION DES NOUVEAUX BRANCHEMENTS | <ul style="list-style-type: none"> RESSOURCES HUMAINES FORMATION COMPTABILITÉ / CONTRÔLE DE GESTION PRÉVENTION / HYGIÈNE & SÉCURITÉ GESTION DE CRISE INFORMATIQUE TELECONTRÔLE / CONTRÔLE EN TEMPS RÉEL RELATION AVEC LES PARTIES PRENANTES ACHATS GESTION DES INVESTISSEMENTS | <ul style="list-style-type: none"> GESTION DU PATRIMOINE Eaux NON FACTURÉES MANAGEMENT DE L'ÉNERGIE SERVICES POUR TOUS GESTION DES INTERVENTIONS |



Maturity, Processes

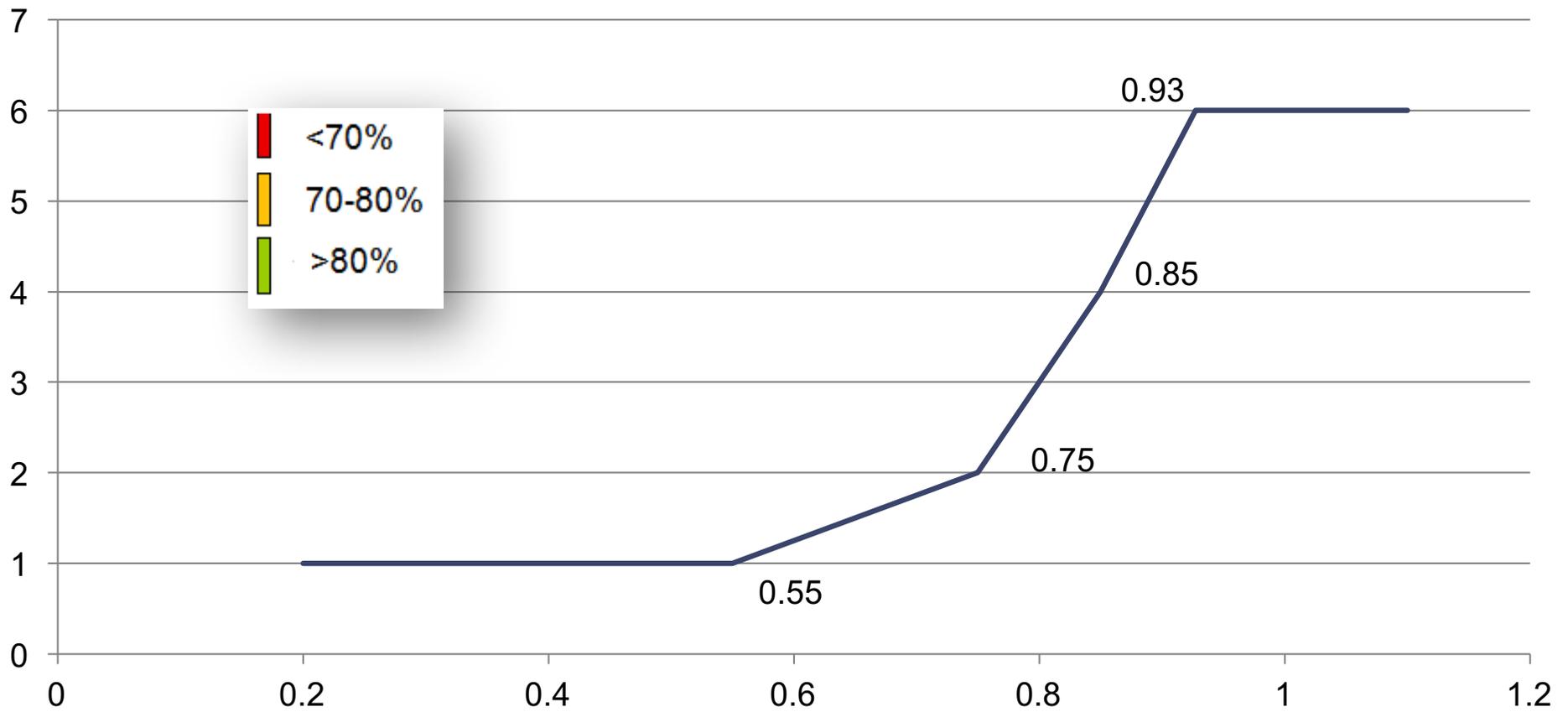
Operational Performance

Maturity Index per KPI

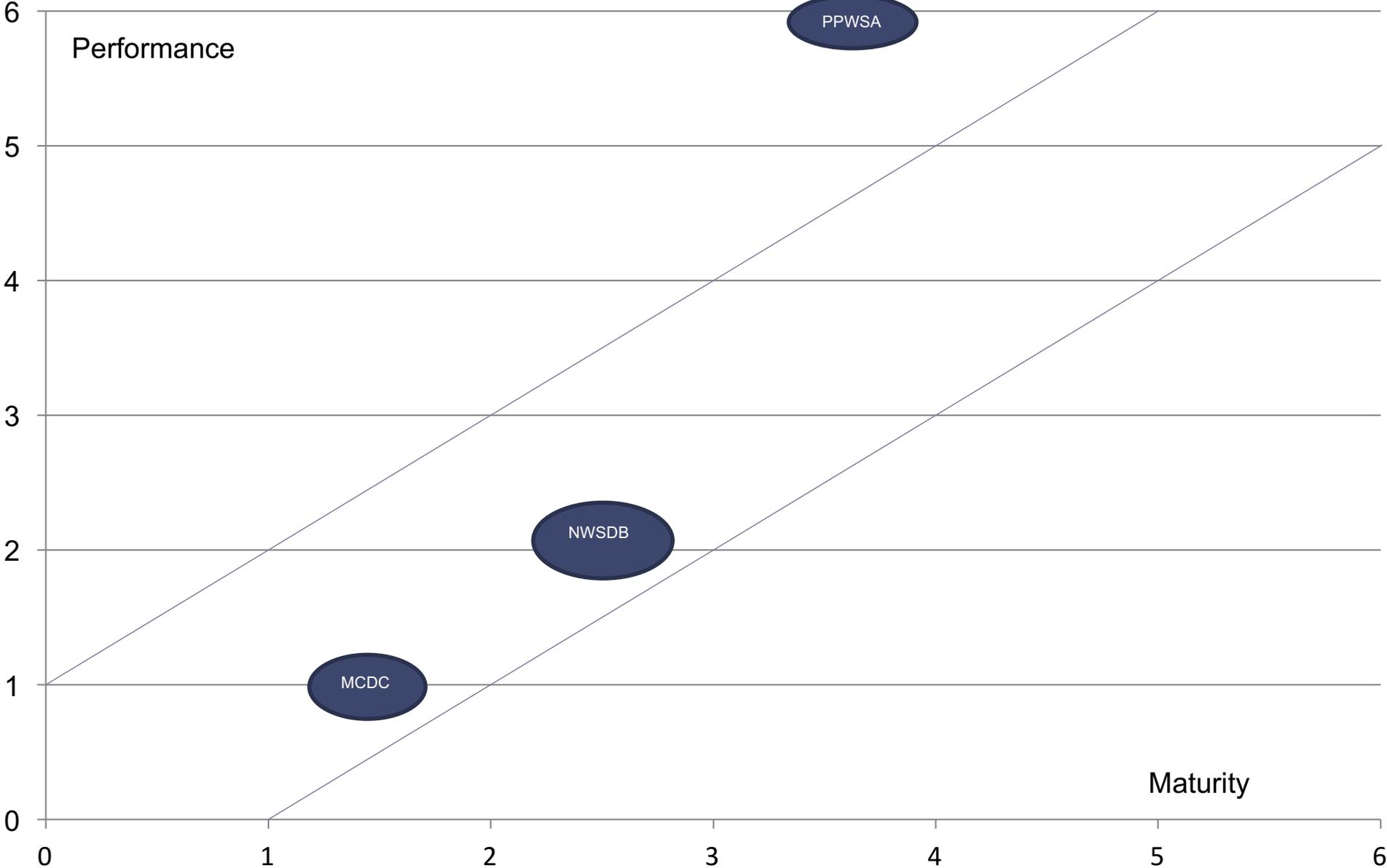
- Select specifically those processes having an impact on the PI
- Average of the maturity notes for this PI = maturity index for the PI

| MÉTIER | | | | ACTIONS | |
|--|---|---|---------------------------------------|---------------------------|--|
| EAU POTABLE | ASSAINISSEMENT | CLIENTÈLE | SUPPORT | TRANSVERSE | |
| 10 Métiers | 10 Métiers | 8 Métiers | 9 Métiers | 5 Actions | |
| GESTION DE LA RESSOURCE | DIAGNOSTIC DU RÉSEAU | GESTION DE LA BASE DE DONNÉES CLIENTÈLE | RESSOURCES HUMAINES FORMATION | GESTION DU PATRIMOINE | |
| STATION DE PRODUCTION & POMPAGE | CURAGE DU RÉSEAU | GESTION DU PARC COMPTEURS | COMPTABILITÉ / CONTRÔLE DE GESTION | EAUX NON FACTURÉES | |
| LABORATOIRE & CONTRÔLE QUALITÉ EAU | EXPLOITATION DU RÉSEAU D'ASSAINISSEMENT | RELEVÉ DES COMPTEURS | PRÉVENTION / HYGIÈNE & SÉCURITÉ | MANAGEMENT DE L'ÉNERGIE | |
| GESTION DES ADDUCTRICES | POSTES DE RELÈVEMENT | FACTURATION | GESTION DE CRISE | SERVICES POUR TOUS | |
| GESTION DES RÉSERVOIRS | EXPLOITATION DES STATIONS D'ÉPURATION | ENCAISSEMENT | INFORMATIQUE | GESTION DES INTERVENTIONS | |
| EXPLOITATION DU RÉSEAU DE DISTRIBUTION | TRAITEMENT & VALORISATION DES BOUES | RECouvreMENT | TÉLÉCONTRÔLE / CONTRÔLE EN TEMPS RÉEL | | |
| RECHERCHE DE FUITES | LABORATOIRE & CONTRÔLE DES REJETS | CONTACT CLIENT | RELATION AVEC LES PARTIES PRENANTES | | |
| MAINTENANCE ÉLECTROMÉCANIQUE | MAINTENANCE ÉLECTROMÉCANIQUE ASSAINISSEMENT | GESTION DES NOUVEAUX BRANCHEMENTS | ACHATS | | |
| INTERVENTIONS & TRAVAUX SUR BRANCHEMENT & RÉSEAU | RÉALISATION DES BRANCHEMENTS & TRAVAUX ASSAINISSEMENT | | GESTION DES INVESTISSEMENTS | | |
| CARTOGRAPHIE DU RÉSEAU EAU | CARTOGRAPHIE DU RÉSEAU D'ASSAINISSEMENT | | | | |

Index for Revenue Water



Revenue Water



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**Thank you for
your attention**

India Experience in improving Operational Efficiency

A. Mahendra
Suez India

ready for the resource revolution



Background

SUEZ in India: Water Distribution Projects

- 1. New Delhi- Client- Delhi Jal Board:** 12-year concession contract covering a population of about 4,00,000 people.
- 2. Bangalore- Client- BWSSB:** 8 year contract for UFW (Un-accounted for Water) reduction in the central zone of Bangalore city, with about 70,000 connections
- 3. Kolkata – Client – KEIIP / KMC:** 6-Year Water Loss Reduction Project in 6 wards in North Kolkata (Cossipore) covering about 25,000 connections
- 4. Mumbai- Client – MCGM:** 5 year Integrated Services contract for Water Distribution Improvement program (WDIP) for the entire Mumbai city. Program focus on integrated service like GIS mapping, Leak control, equitable distribution, water for slum etc. to improve the distribution quality and customer satisfaction.
- 5. Pimpri - Chinchwad (Pune) - Client- PCMC:** Reducing water losses by detecting and repairing of “Invisible Leaks” in the distribution network using Helium as tracer gas technology.
- 6. Bangalore – Client – BWSSB:** Helium leak Detection-Client BWSSB: 1 year contract focused on reducing physical losses in the distribution network length of approx. 1800 Kms using Helium as tracer gas technology

In this Presentation...

- **Focus is on three of our ongoing projects**
 - Outline of Project Scope
 - Pros & Cons of the Project Structure
 - KPIs and Performance Metrics
- **Ignore the usual criticism / negatives ...**
 - Bad Contract
 - Poor baseline data, no drawings about existing assets
 - Political risks
 - Poor Cash flows
 -
 -
- **Present Operator's perspective for future projects**

Malviya Nagar Concession Contract (2013)

KEY Project Features

- 12-year concession contract for an area in south Delhi of 400,000 population
- Tender fixed Capital Cost of Rs 171 Crores (~ \$25 Mn)
 - Bidders didn't quote for Works item rates (fixed by contract)
 - Operator finances \$4 Mn
- DJB supplies about 75 MLD of bulk treated water for distribution to project area
- Operator is in-charge of the O&M - Network as well as all Customer Services (meter reading, billing, collection, complaint handling)
- DJB fixes tariff (same as in rest of Delhi), and Operator collects user charges and deposits in the escrow account
- Operator's O&M Revenue is for only the water billed & collected
 - Operator's Monthly O&M Revenue: $\text{Gross Rate} * \text{Volume billed and collected during the month}$
 - Gross Rate re-adjustment if the business plan assumptions change.

Bid Variable: Gross Rate per m³ of Volume billed & Collected

KPIs / Performance Metrics

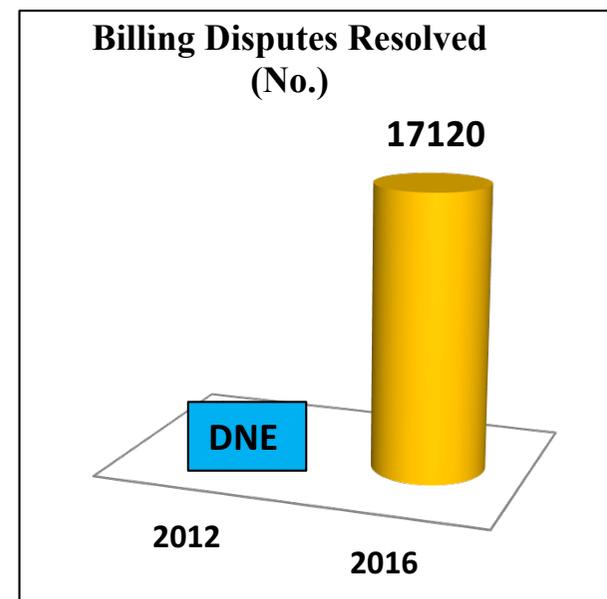
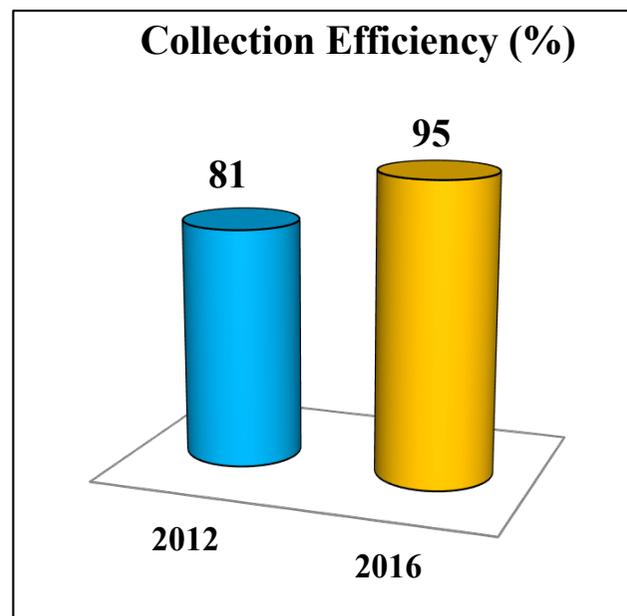
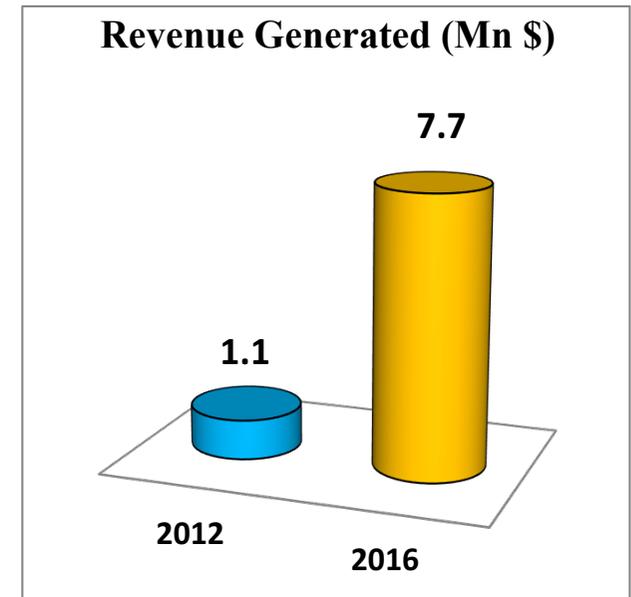
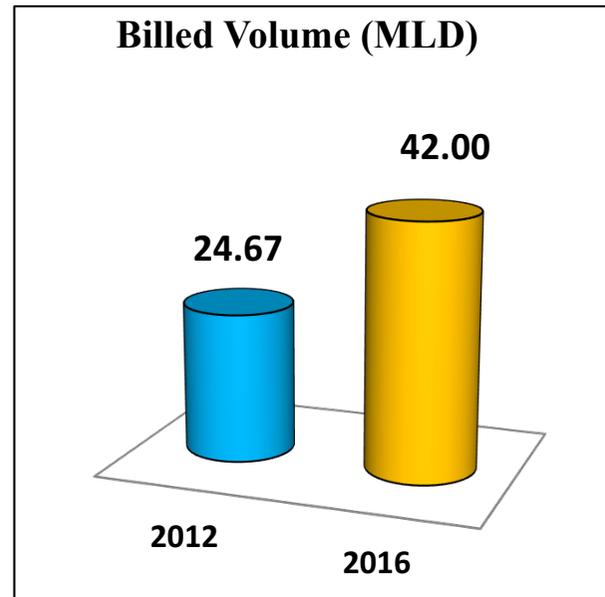
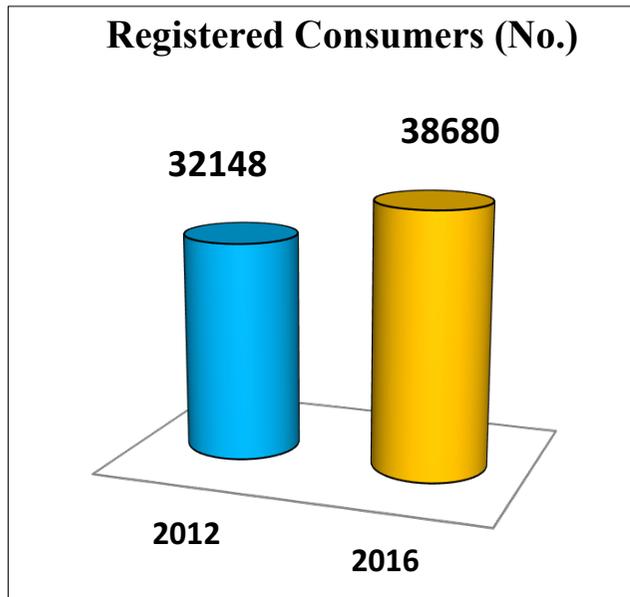
| Sr. No. | Service Level Benchmark | Baseline (2011) | | | |
|---------------------------|-----------------------------|-----------------|--|--|--|
| ASSOCIATED WITH PENALTIES | Coverage of water supply | 84% | | | |
| | Per Capita supply of water | 286 lpcd | | | |
| | Continuity of supply | 3-8 hrs | | | |
| | Extent of metering | 27% | | | |
| | Quality of Water | Not meeting | | | |
| | Redress of complaints | No data | | | |
| ASSOCIATED WITH REVENUE | Efficiency in Collection | 81% | | | |
| | Extent of Non Revenue Water | 67% | | | |

Performance Achieved

| Sr. No. | Service Level Benchmark | Initial (2011) | Current (Jan 17) | Contractual target | Comment |
|---------------------------|-----------------------------|----------------|------------------|--|-----------------------|
| ASSOCIATED WITH PENALTIES | Coverage of water supply | 84% | 95% | 100 % | Unauthorized areas |
| | Per Capita supply of water | 286 LPCD | 173 LPCD | 150 LPCD (ultimate Year) | High Customer wastage |
| | Continuity of supply | 3-8 hrs | 3-8 hrs | 24 hrs (End of Works Period) | 24/7 In two areas |
| | Extent of metering | 27% | 86% | 100 % | |
| | Quality of Water | Not meeting | 100% | 100 % | |
| | Redress of complaints | No data | 81% | 80% | |
| ASSOCIATED WITH REVENUE | Efficiency in Collection | 81% | 95% | 95 % | |
| | Extent of Non Revenue Water | 67% | 39% | <ul style="list-style-type: none"> • 40% (End of Works Period) • 15% (Ultimate Year) | |

Most importantly, Reduced / Optimized Capex from \$ 25 Mn to \$ 12 Mn with better asset management and leak detection / repair programme

Revenue Collection: Achievements



Pros of this Structure

- Project's revenue model has a few in-built KPIs (paid only for volume billed & collected)
 - Reduction in NRW
 - Improvement in Collection Efficiency
 - Increase in Service Coverage
 - Increase in Customer base
- From DJB's perspective,
 - Increase in Revenue for DJB as well as Operator
 - Operator's revenues are 100% performance based (paid from collected user charges)
- Well defined payment security mechanism, negligible credit risk; all user charges deposited in the escrow account with Operator's first charge on the monies
- Rate adjustment / Rebasing of Gross Rate for change in business plan assumptions (bulk water supplied by DJB, Operator's investment, etc.)
- All other liabilities and KPI Losses are capped at 10% of Annual Revenue

Cons of this Structure

- 40,000 connections not enough for economies of scale
 - fixed costs are very high to ensure high quality O&M for very demanding client and end-customers
- 2 years not enough for Works; O&M KPIs should be linked with completion of Works Period
- Not enough water for conversion to continuous water supply
- No incentive for optimizing Capex
- No incentives but only penalties for other KPIs

Reduced / Optimized Capex from \$ 25 Mn to \$ 12 Mn with better asset management and leak detection & repair programme

- Despite Savings for DJB, No incentive to Operator,
- In fact resulted in revenue loss for Operator

Bangalore UFW Reduction Contract (2013)

Project Objectives: UFW Reduction

- 8-Year Project divided in two parts (BOQ based)
 - First 3 years : Works Contract including services (Survey, design & construction works of DMAs, leaks detection and repair, base lining and UFW reduction works)
 - Last 5 years : Maintenance Contract (for maintenance, leakage control and sustaining UFW level)
- Reduction of UFW to 16% overall across all established DMAs in the project area
- UFW target level calculated by adjusting measured quantity supplied to stand posts and slum, operation use (scouring etc), and consumption estimated for illegal connections
- UFW for each DMA will be expressed as follows:

$$\text{Initial \% UFW} = \frac{X - (A + B + C + D)}{X} \times 100 \%,$$

Where:

X = Water input to the system (DMA) during the period (typically 1 month)

A = Water billed during the period

B = Water legally supplied but not billed (including slum and standpost) during the period

C = Operational use (scouring, jetting, dust suppression, etc.) during the period

D = Tankers metered and billed/unbilled during the period

Graded penalty mechanism if UFW is more than 16%

Methodology and Contract Structure

- Design-Build Contract based on FIDIC, 1999
- Contractor is not responsible for
 - Day-to-day distribution system operations and supply of water to consumers
 - Meter reading, billing and collection of user charges
 - Disconnection of Illegal connections
- Methodology to achieve 16% UFW is specified - based on creation of DMAs
- BOQ based project; assumption is that BOQ implementation will enable UFW reduction which is debatable
 - 153 Kms of pipes out of 800 Kms to be changed
 - 22,000 customer meters and 39,000 HSCs (out of 70,000) to be changed

Measurement of UFW:

- Establish DMAs and Report Initial UFW (without undertaking any repairs)...**overall 58%**
- Report Baseline UFW (after replacing PVC, AC pipes, and <100 mm dia pipes)...**overall 40%**

Pros of this Contract Structure

- Single KPI of UFW: All stakeholders stay focused with the project objective
- BOQ oriented revenue model – easy to monitor project progress
- Based on FIDIC contract, both parties familiar with interpretation of most contractual clauses
- UFW definition allowed deduction of legitimate use in slums etc. by isolating slum areas with meters
- Contract clearly defined policy decisions regarding pipe replacement (below 100 mm all MOC and PVC pipe to be replaced)
- Budget for training of BWSSB Engineers

CONS of this Contract Structure

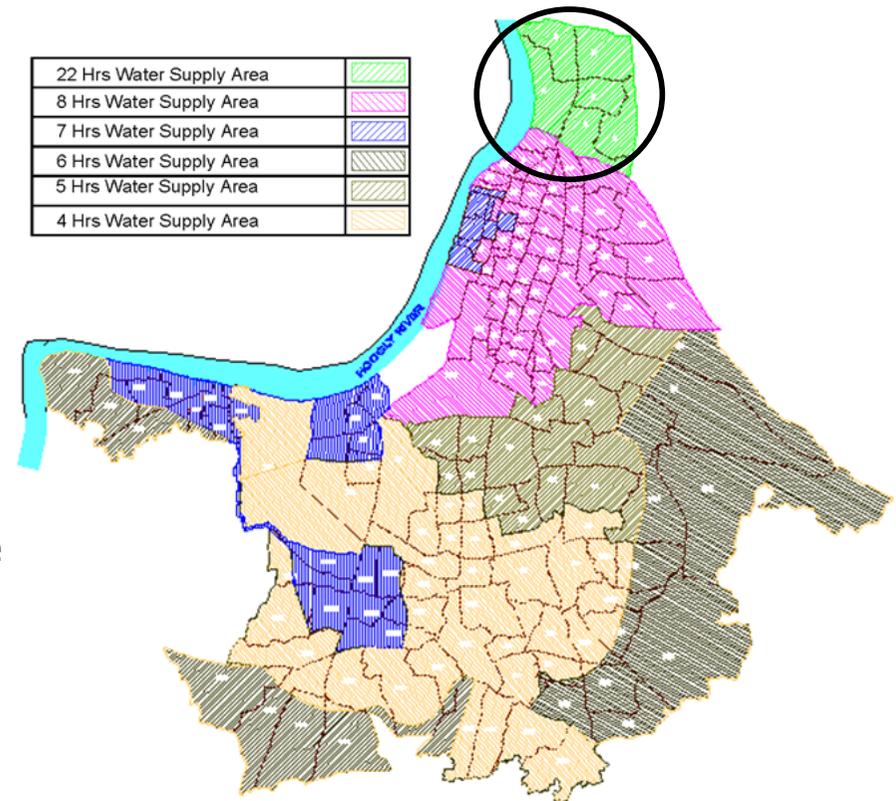
- Without control on O&M,
 - difficult to implement DMAs, carryout PZTs, or schedule leak detection & repair activities
 - actions of Client's O&M team affects the UFW level. Eg. change in operations strategy, or extension of supply from a DMA, opening of boundary valves etc.
- Target of 16% UFW too stiff
 - for all DMAs irrespective of customer profile, network, prevailing operations
 - should be linked to DMA's initial UFW
- Contractor is not responsible for meter reading and billing, hence not in control of commercial losses component of UFW
- Interface with O&M staff to facilitate UFW works not well addressed in the Contract
- BoQ approach, with Works accounting for 82%, does not motivate enough to optimize Capex as it leads to revenue loss

Mainly a Works Contract with little scope for Operator to value-add

Kolkata Loss Reduction Contract (2016)

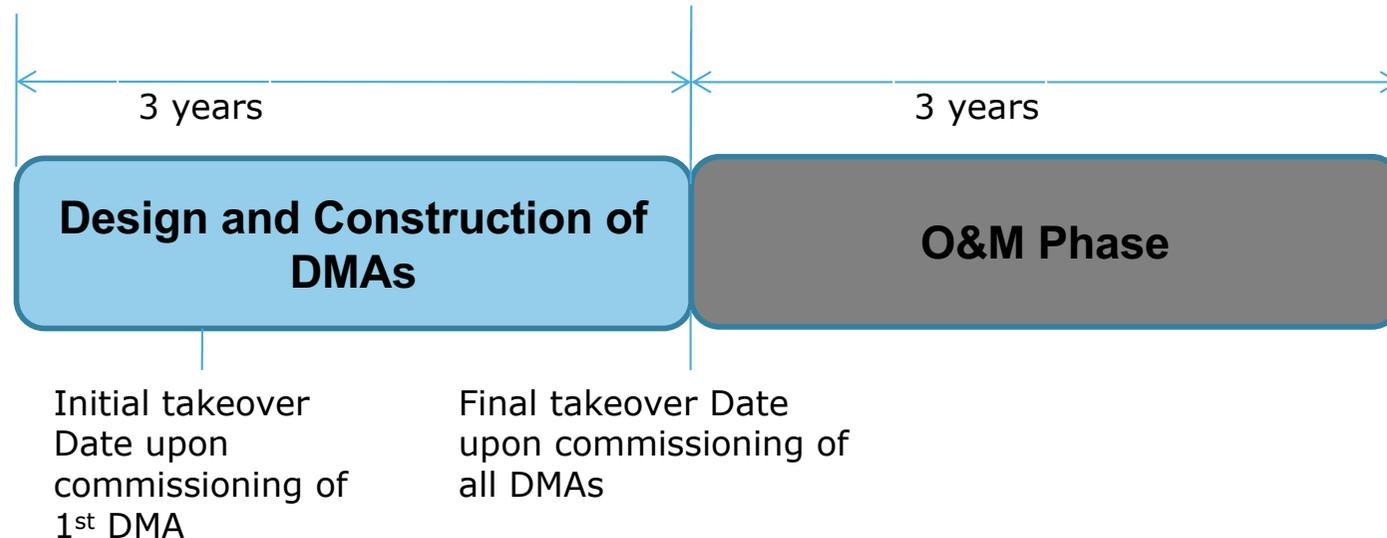
Background

- **6-Year Loss Reduction Contract in Cossipore (Northern Kolkata)**
 - Client is Kolkata Municipal Corporation (KMC) and Financed by ADB
 - 3-Years Works Period and 3-years O&M
- **Project Area**
 - 6 Wards out of 141 Wards in the city
 - ~ 9.0 Sq. km with population of 250,000
 - Old neighborhood - lot of slum / low income population
- **Water supplied from Tallah Complex, (pumping station and 9 MG elevated tank) which is in project area itself**
 - 25,000 connections (~ 15 DMAs)
 - 18 hours / day Supply; 90-98 MLD Water supplied (~ 350-400 LPCD)
 - Miya Water estimated 64% losses in this project area



Project Phases

Two Phases spread over 6 years, starting from Contract Signing Date



- **Project Scope – Design and Works (3 Years)**

- Design, Hydraulic Modelling and Establishing DMAs (~ 25000 connections)
- Works within DMAs as per SIP (~150 Kms of distribution network, 25,000 HSCs & Domestic meters, Valves, PRV, sluice valves, Flow meters, SCADA)

- **Project Scope - O&M Phase (3 Years)**

- Water Distribution in the Project Area (~97 MLD is the current supply)
- In-charge of Network and back-end support to KMC for Customer Services
- Meet KPI obligations - NRW, 24/7 supply, Water Quality and Complaint Resolution

• **DMA Approach: Design-Build-Operate for cluster of DMAs over 3 years**

• **NRW and 24/7 KPI to be measured at each DMA level, and not at Project level**

Bid Variable and KPIs

- **Bid Variable: Sum of three Streams**
 - DMA establishment Fee: Towards surveys, hydraulic modeling, SIP, creation of hydraulically discreet network, zero pressure test, as built drawings, leak detection and achieving 24/7 supply
 - Works (BOQ based)
 - O&M Services: Fixed and Performance Fee (70:30)
- **Mandatory to quote DMA fee, Works Price and O&M fee in ratio of 18:54:28**
- **Four KPI's; NRW reduction being the most important one (has 15% weightage in O&M Fees)**

| | | | | | | | | |
|--|---------------|---------------|---------------|--------------|--------------|--------------|---------------|----------------|
| NRW achieved | 20% | 25.00% | 30% | 32.00% | 35% | 37.00% | 40.00% | >=50.00% |
| NRW Performance Fees Received (as %age of O&M Fees) | 15.00% | 12.50% | 10.00% | 8.00% | 5.00% | 1.00% | -5.00% | -25.00% |

Pros of this Contract Structure

- Such DBO contracts are more likely to succeed in the Indian Market; Pure conventional O&M / management contracts are not generating interest
- DMA Establishment and O&M Revenue is 46% of total contract value – an improvement over Bangalore contract
- BOQ oriented Works model – less risky for both parties, easy to monitor project progress
- O&M KPIs commence only after DMA commissioning
- KPIs are well defined

Good scope for an Operator to improve operational efficiency

CONS of this Contract Structure

- Contractual timelines with quarterly targets too rigid
 - lack of field data and terrain complexity need to be considered
 - iterative profile of design and UFW reduction works need to be factored
 - lead time for Procurement; an advanced procurement provision would help
 - However still possible to achieve annual targets and overall 3-years Works period
- DMA Establishment and O&M Revenue are linked to number of connections
 - Decrease in number of connections vis-à-vis tendered BOQ will result in significant loss of revenue and profits to Operator
- Contractor should be in-charge of O&M after the “Study Period” even during DMA implementation phase, for more operational flexibility
- No incentive for Contractor to save Capex
- Few key contractual provisions need simplification, especially project timelines, fixed O&M fees (which is linked to performance & hence not exactly fixed), definition of DMA establishment & commissioning, performance fee payable for NRW

Much superior project structure than that of Bangalore and a few other upcoming projects

Recommendations

Recommendations (1)

- **Design-Build-Operate (DBO) is the right structure wherein Operator has control on Works and O&M**
 - Works as BOQ items
 - DMA Establishment as fixed fee
 - O&M as monthly fee with 70% as fixed fee
- **String O&M scope is a must have for improving KPIs; should commence after Study period**
- **Ensure Projects are not Works dominated, but has equal or more O&M orientation**
 - Not necessary to change all pipes and assets
 - DMA Establishment and O&M Revenue should be atleast 50% of Works Value
- **An Operator adds value in**
 - Optimizing Capex enabling savings for the Client
 - Improving Operational efficiency, superior service delivery, better customer satisfaction
- **Incentivize Operator for such efficiency improvements**

Recommendations (2)

- **KPIs inbuilt with the Revenue model are ideal (like Delhi Contract)**
- **Focus should be on adopting few KPIs; for emerging markets, focus first on three KPIs**
 - Increase in Service Coverage of piped network
 - NRW reduction
 - Water quality
- **Rebasing / Fee Adjustment if tender conditions change**
- **Capping of overall liabilities and penalties**
- **Payment Security with Escrow mechanism**

Thank You