



College of Engineering
Civil Engineering Department

The Unified Water Sector Strategy for the GCC Countries for the Years 2015-2035: the Sanitary Wastewater and its Role in Sustainable Development

الإستراتيجية الموحدة للمياه لدول مجلس التعاون لدول الخليج العربية ٢٠١٥ – ٢٠٣٥ م:
مياه الصرف الصحي ودورها في التنمية المستدامة

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Overview

- **The GCC Unified Water Strategy (the GCC-UWS)**
 - **Vision and Mission**
- **Main Challenges facing Wastewater Sector in GCC Countries**
- **Strategic Objectives related to Wastewater**
Policies → Programs → Indicators KPIs → Milestones & Targets
- **Benefits of Implementing the GCC-UWS in Relation to the Wastewater Sector**

The GCC - UWS

The Vision

By 2035 the GCC countries have established sustainable, efficient, equitable, and secure water resources management systems contributing to their sustainable socio-economic development.

The Mission

To align GCC states' national water strategies and master plans with a unified GCC water management strategy that foster joint initiatives and strengthen the capacities of each country in achieving a rational, integrated, efficient, and sustainable management of their water resources.

GCC Unified Water Strategy Vision & Mission

**Development
&
Sustainability
of Water
Resources**

**Efficient &
Equitable
Water
Resources
Utilization**

**Enhanced
Municipal
Water
Supply
Security**

**Effective
Water
Governance
&
Awareness**

**Economic
Efficiency &
Financial
Sustainability**

CAPACITY BUILDING & TRAINING

R&D

ENVIRONMENT & ECOLOGY

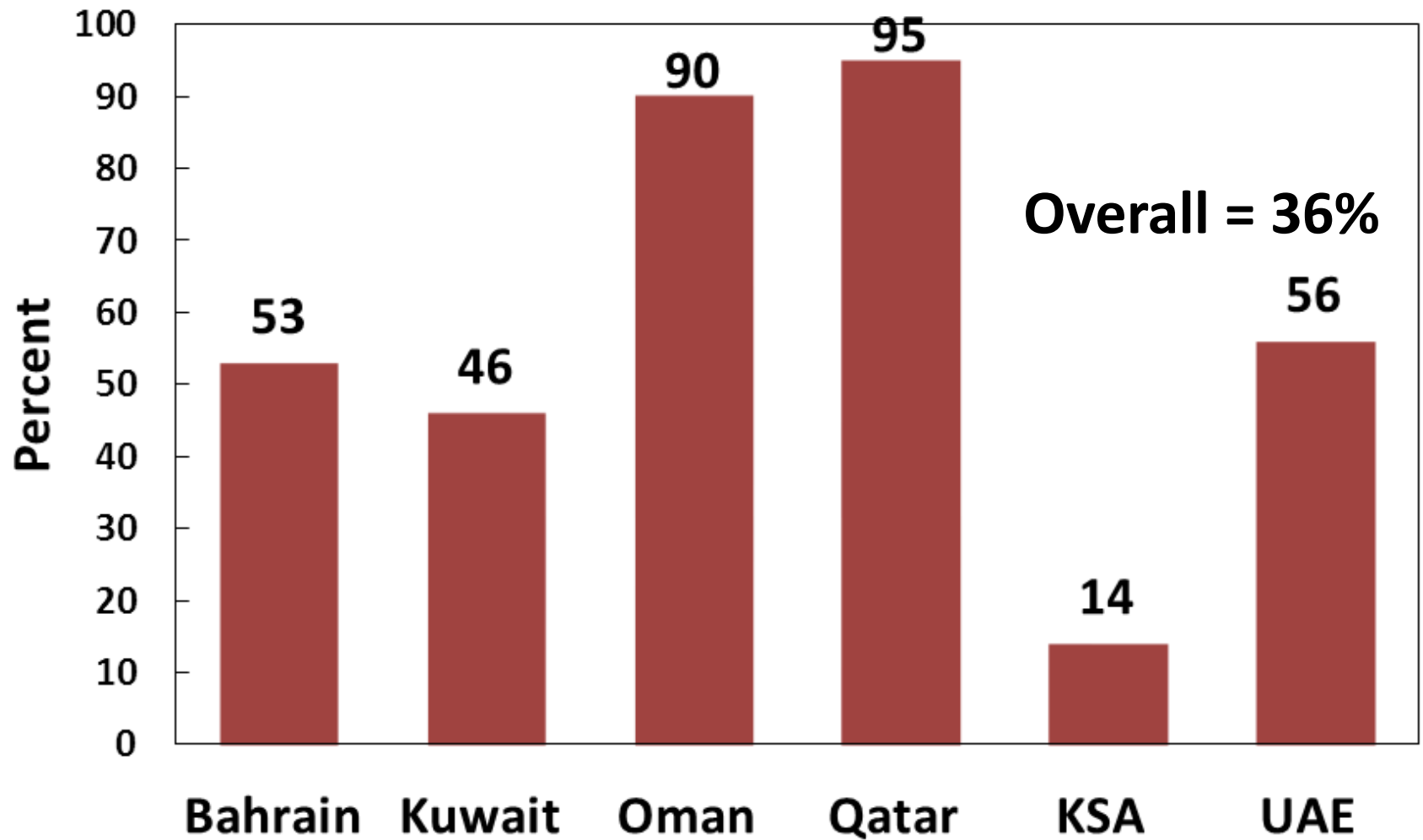
CLIMATE CHANGE

5 Strategic Themes

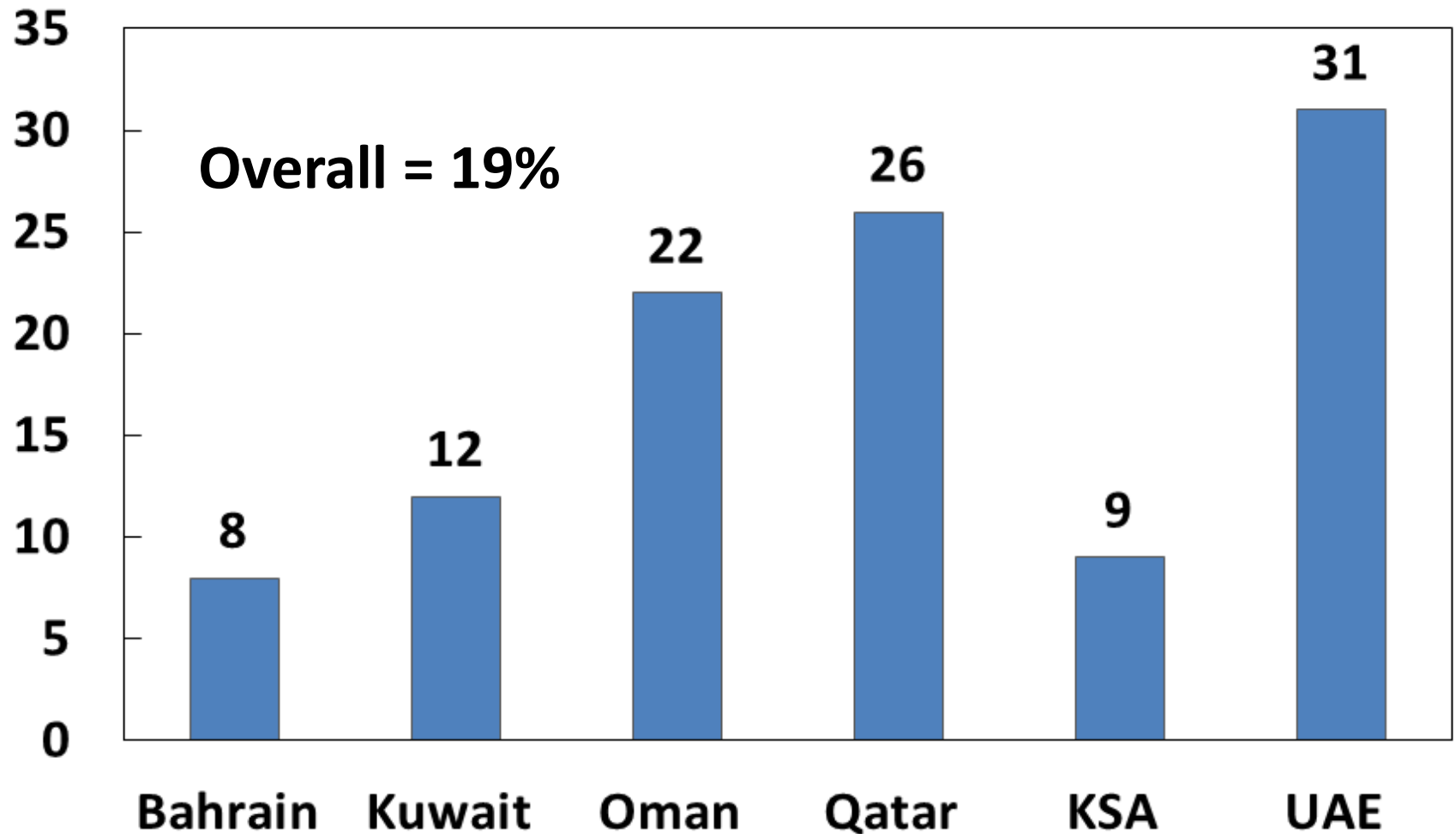
Main Challenges facing Wastewater Sector in GCC Countries

- **Low Efficiency of Wastewater Recovery**
(Collected Wastewater on average $\nless 50\%$ of the total
Municipal Water Supply)
- **Large Mismatch between Wastewater Treatment
Levels and Treated Wastewater Reused**

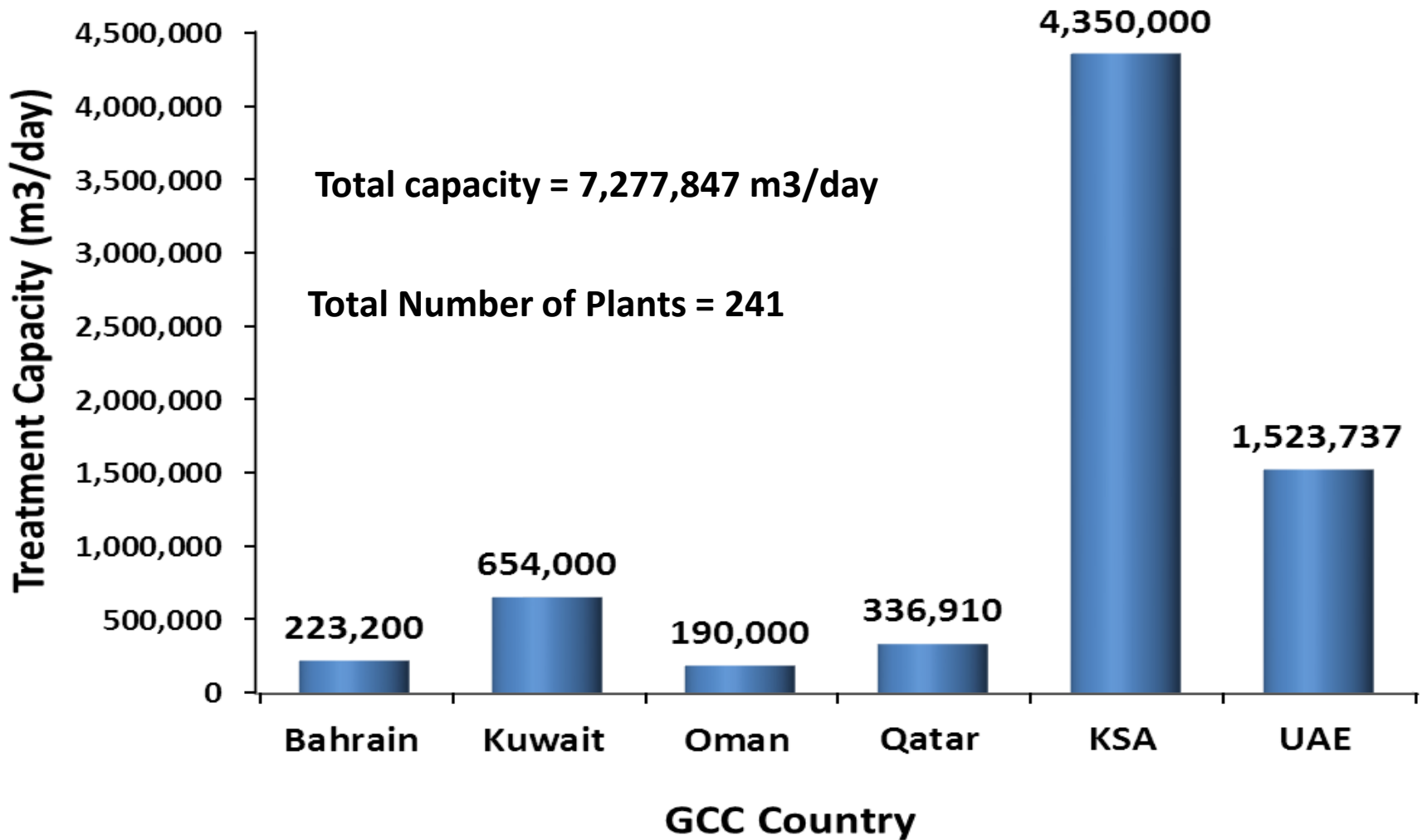
Percent of Reused to Treated Wastewater



Percent of Reused Wastewater to Municipal Water



Wastewater Treatment Facilities in the GCC Countries in 2012



Main Challenges facing Wastewater Sector in GCC Countries

- **Very Low Cost Recovery of the Wastewater Sector**

Absence of Wastewater Tariff Would:

- **Increase the Wastewater Sector's Financial Burden on the Fiscal Budget**
- **Make the Sector Captive to Government Allocations,**
- **Deprive the Sector From Having an Enforcing Mechanism in Water Conservation**
- **Not Encourage Water Saving, Especially in the Agricultural Sector.**



Main Challenges facing Wastewater Sector in GCC Countries

- **Rapid Expansion in Septic Tanks due to Lagging Wastewater Services behind Water Supply Services.**
- **Inadequate Professional Human Resources**

UWS Strategic Objectives

SO1: To acquire technology development and manufacturing of desalination and water treatment plants and diversification of energy resources

SO2: To develop and protect conventional water resources

SO3: To maximize municipal wastewater collection, upgrade treatment and increase economic and safe use of treated wastewater and sludge

SO4: To achieve the highest international standards of water and wastewater services

SO5: To increase water efficiency and manage demands in the municipal and industrial sectors

SO6: To establish a water-efficient and rational agricultural sector compatible with the available water resources

SO7: To secure water supply during emergencies and disasters

SO8: To improve governance in the water sector to achieve effective and integrated water resources management

SO9: To achieve water-oriented society in GCC countries

SO10: To minimize water supply economic costs and increase cost recovery while maintaining quality of service

Strategic Objectives related to Wastewater

Strategic Objective –3:

To Maximize Municipal Wastewater Collection, Upgrade Treatment and Increase Economic and Safe Use of Treated Wastewater and Sludge

Strategic Objective-4:

To Achieve the Highest International Standards of Water and Wastewater Services

Strategic Objective –3: To Maximize Municipal Wastewater Collection, Upgrade Treatment and Increase Economic and Safe Use of Treated Wastewater and Sludge

Policy-SO3-1

Increasing Wastewater Collection Rates, Treatment Capacities, and Treatment Levels

Programs:

Develop and implement integrated programs for increasing wastewater collection, expanding treatment capacity, and upgrading treatment level in GCC countries

Policy Indicators:

- **Percentage of collected wastewater to municipal water supply**
- **Percentage of treated wastewater to collected**
- **percentage of tertiary treated (or higher) wastewater to collected wastewater**
- **percentage of untreated wastewater discharged to the surrounding environment to collected wastewater**

Policy-SO3-2

Increasing Treated Wastewater Reuse in all Appropriate Sectors

Programs:

Develop an integrated wastewater reuse plan in the GCC countries

Policy Indicator:

Percentage of reused wastewater to treated

Policy-SO3-3:

Enforcing Legislations Related to Protection of Health and Environment in all Stages of Collection, Treatment and Reuse of Domestic Wastewater

Programs:

Establish mechanisms and institutional structure for enforcing legislations related to environmental protection in projects of wastewater collection, treatment , reuse and disposal

Policy Indicators:

Existence of mechanism and institutional structures to monitor and ensure compliance to legislations related to environmental protection in projects of wastewater collection, treatment reuse and disposal



Policy-SO3-4:

Maximizing the Beneficial Use of Wastewater Sludge

Programs:

Develop programs for sludge beneficial utilization in each GCC country including energy recovery

Policy Indicators:

Existence of programs for sludge beneficial utilization in each GCC country

Strategic Objective –4: To Achieve the Highest International Standards of Water and Wastewater Services

Policy-SO4-1

Ensuring the Highest International Standards of Water Supply and Sanitation Services to all Populated Areas in the GCC Countries

Programs:

Develop integrated programs for full national coverage in water supply and sanitation services in the GCC countries

Policy Indicators:

- Percentage of population connected to the sanitation network to total population in each GCC country**
- Percentage of treated domestic wastewater meeting the reuse criteria in each GGC country**

Policy-SO4-3:

Achieving the Highest Management Standards for Sanitation utilities

Programs:

Adopt and implement the highest benchmarking system for sanitation utilities in the GCC countries

Policy Indicator:

Benchmarking rank of sanitation utilities in the GCC countries in comparison to developed countries in the world

Policy SO4-4:

Enhancing the Capacity and Performance of Water Supply and Sanitation Personnel

Programs:

Adopt and implement a professional personnel certification program in water supply and sanitation sector/utilities within the capacity development and training programs of the Water Supply and Sanitation sectors in the GCC countries

Policy Indicators:

- **Percentage of professionally certified personnel in water supply and sanitation utilities in each GCC country**
- **Percentage of national personnel professionally certified to total nationals in water supply and sanitation utilities in each GCC country**

Detailed Implementation Plan for Strategic Objective-3

SO3: To Maximize Municipal Wastewater Collection, Upgrade Treatment and Increase Economic and Safe Use of Treated Wastewater and Sludge

| Policy/Sub-objective | Program/Initiative | Activity/Tasks | Ownership/Responsibility | Activity/Task completion Indicator | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | Policy KPI |
|---|--|--|--------------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO3.1 Increasing wastewater collection rates, treatment capacities, and treatment levels | Develop and implement integrated programs for increasing wastewater collection, expanding treatment capacity, and upgrading treatment level in GCC countries | Develop a long-term national master plan of wastewater as part of investment plans in wastewater collection, treatment capacity, appropriate advanced treatment technologies, and stage programs for upgrading existing STPs for each GCC country that suite potential reuse applications and environmental protection for the year 2035 | COSM | Development of the long-term wastewater sector master plan (including collection, capacity, treatment, and reuse) in each GCC country (Y/N) (note: if exists, which is probably the case in most GCC countries, update) | | | | | | | | | | | | | | | | | | | | | | <ul style="list-style-type: none"> - Percentage of collected wastewater to municipal water supply - Percentage of treated wastewater to collected - percentage of tertiary treated (or higher) wastewater to collected wastewater - percentage of untreated wastewater discharged to the surrounding environment to collected wastewater (SDG indicator, 2016-2030) |

KPIs, Milestones, and Targets for the Strategic Objectives

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------|------|------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO3-1- Collected Wastewater to Municipal Water Supply | % | Current % for each GCC country | | | 60% | | 70% |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------|------|------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO3-2- Treated Wastewater to Collected | % | Current % for each GCC country | | | | 90% | |
| SO3-3- Tertiary (or higher) Treated to Collected Wastewater | % | Current % for each GCC country | | | | 90% | |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------|------|---------------------------------------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| S03-4- Untreated Wastewater Discharged to the Surrounding Environment to Collected Wastewater | % | To be determined for each GCC country | | | | 50% reduction of 2015 levels | |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------|------|------|------------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO3-5- Reused Treated Wastewater to Total Treated | % | Current % for each GCC country | | | | | 90% |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------------------------------------|------|------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO3-6- Establishment of Mechanism and Institutional Structures for Enforcing Legislations Related to Environmental Protection in Projects of Wastewater Collection, Treatment and Reuse | Y/N | Existence of institutional structures in each GCC country | | By 2020 in all GCC countries | | | |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|--|------|---|---------------|------|---|------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO3-7- Development and Implementation of Comprehensive Programs for Sludge Beneficial Utilization in Each GCC Country Including Energy Recovery | Y/N | Current programs in each GCC country | | | By 2025 Programs developed and started to be implemented | | |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|---|-------------------|--|-----------|------|------|------|--|
| | | | 2016-2019 | 2020 | 2025 | 2030 | 2035 |
| SO4-1-Population Connected to the Sanitation Network to Total Population in each GCC Country | % | Current sanitation coverage % in each GCC country | | | | | 80% (min.) |
| SO4-2-Benchmarking rank of Sanitation Utilities in the GCC countries | Benchmarking Rank | Current benchmarking of sanitation utilities in each GCC country | | | | | Rank of GCC SS utilities matching those in developed countries |

| Indicator | unit | Benchmark as of 2015 | Target | | | | |
|---|------|--|---------------|------|------|------|------|
| | | | 2016- 2019 | 2020 | 2025 | 2030 | 2035 |
| SO4-4- National Personnel Professionally Certified to total Nationals in Water Supply and Sanitation Utilities in each GCC Country | % | Current % of GCC nationals in WS&S in each GCC country that are professionally certified | | | | | 100% |

Benefits of Implementing the GCC-UWS in Relation to the Wastewater Sector

- Simulation of the dynamics of water management system dynamics using the WEAP Modeling System

"Business-As-Usual" scenario vs. The scenario of Increasing the collection rate of wastewater to 60% by 2025

Provision of about 70 billion m³ during the strategy period, which can be reused in various applications and development activities, and thereby:

- reducing the pressure on natural water resources
- enhancing the sustainability of these activities
- reducing the rates of consumption of energy required to produce this amount from other sources.



Thanks