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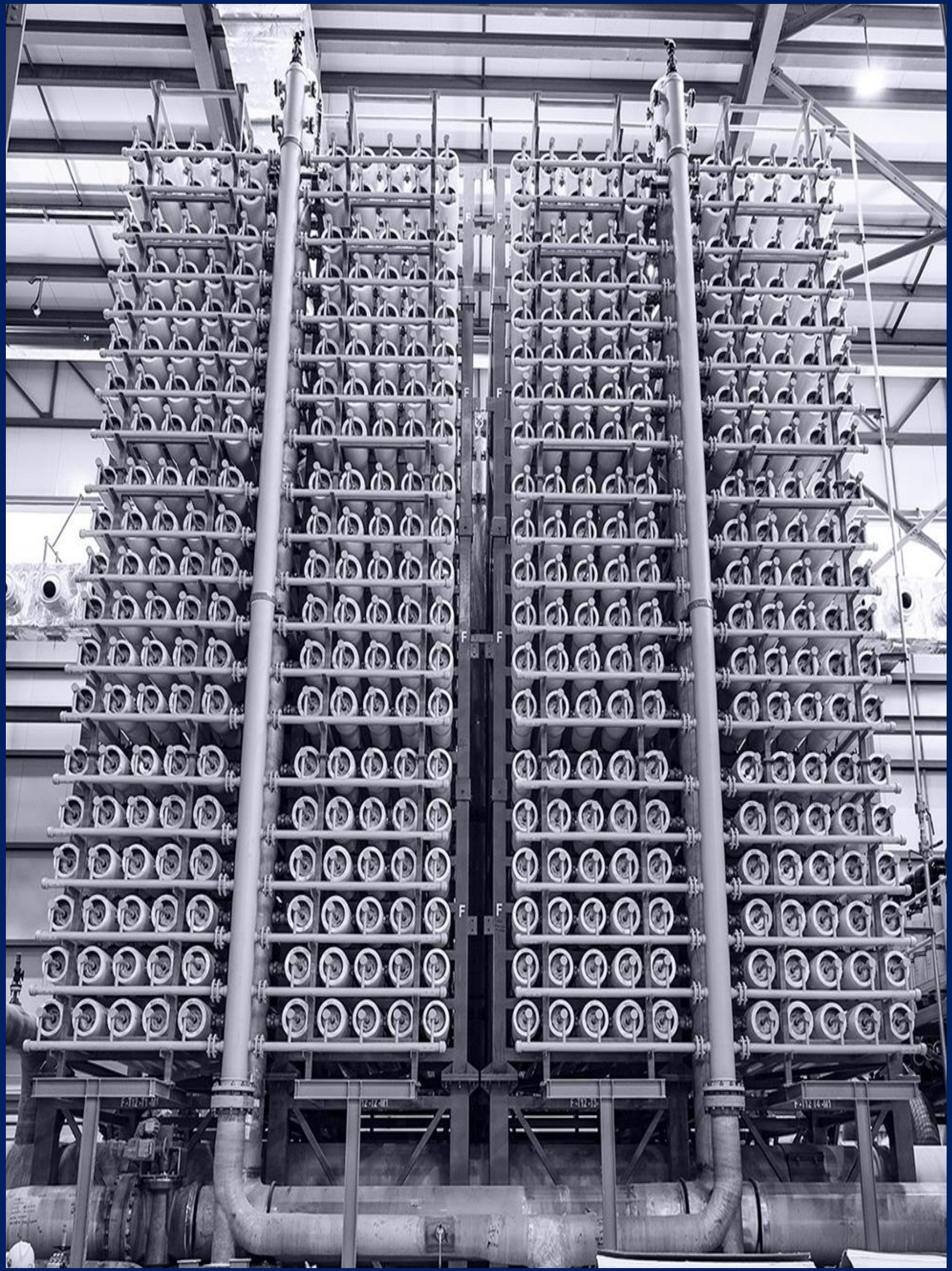
Mena Water & Wastewater 2023

Market outlook in 2024



MEED Webinar, 21 September 2023
Energy & Technology Editor
Jennifer Aguinaldo@meed.com

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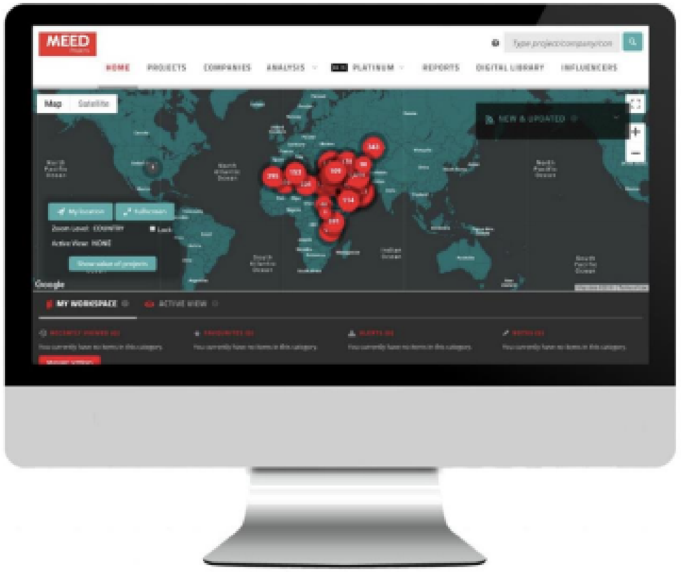

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MENA Water & Wastewater 2023 Report

Report's pre-launch ~~$4,000~~ $3,500

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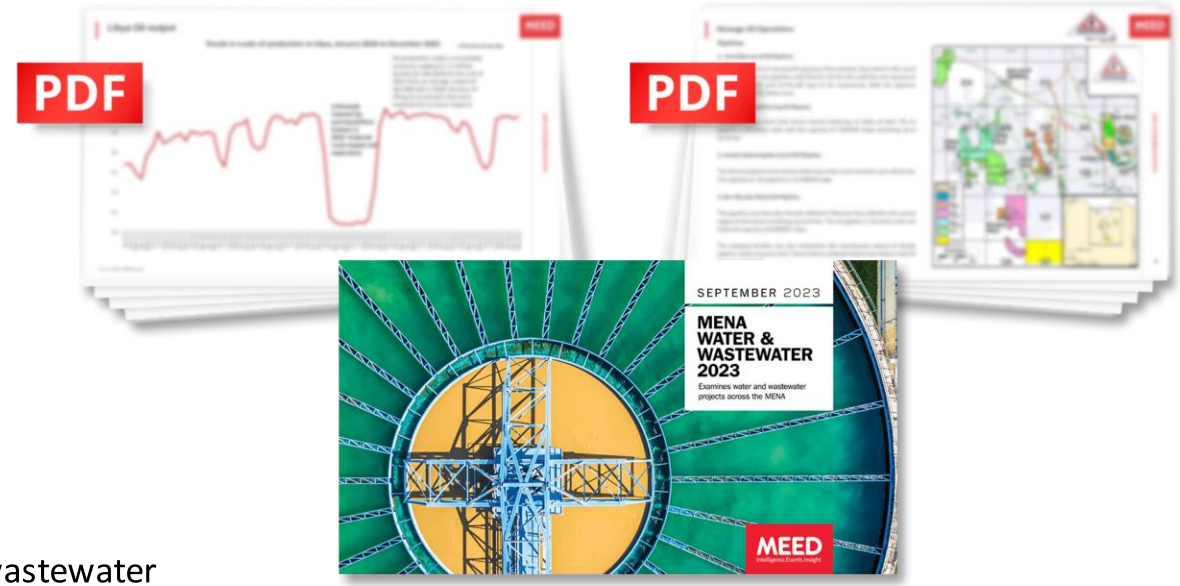

MENA Water & Wastewater 2023 Report includes:

- Understand the Middle East and North Africa (Mena) water and wastewater sectors
- Analysis of the outlook for Mena water and wastewater projects
- Detailed analysis of water project investment plans in 12 Mena markets and regional overview
- Assessment of opportunities in Middle East water projects
- Project opportunities with clients and procurement details
- Investment drivers and client spending plans
- Understand risks and set strategy in the Mena water sector

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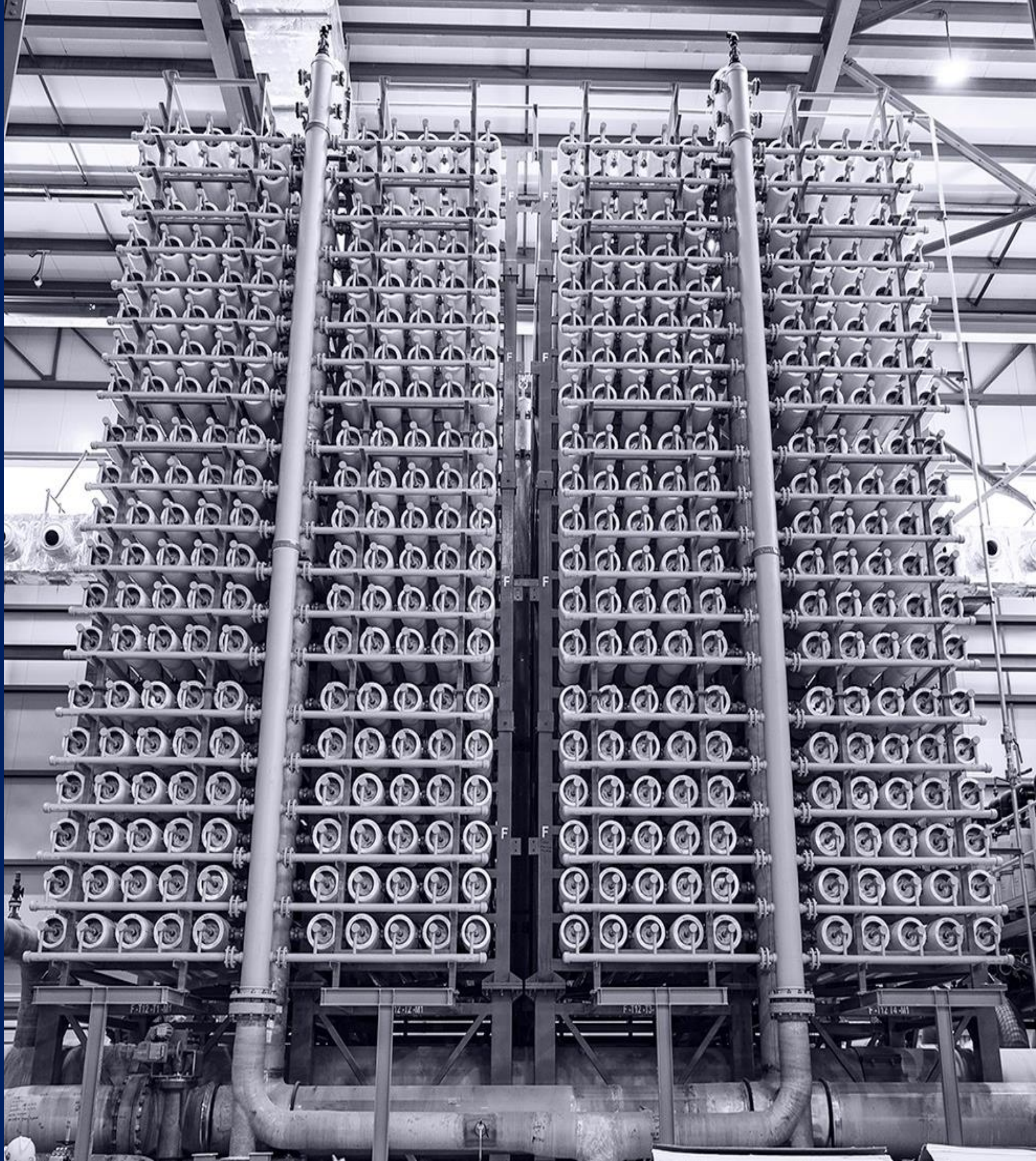
Introduction



Overview

- 16 of the world's 25 extremely water stressed countries are in the Middle East & North Africa region (Mena). Water is a national security issue

NATIONAL WATER STRESS RANKINGS

Search for a country...

BASELINE WATER STRESS	COUNTRY RANKING, 2019
Extremely High (>80%)	1. Bahrain, 2. Cyprus, 3. Kuwait, 4. Lebanon, 5. Oman, 6. Qatar, 7. United Arab Emirates, 8. Saudi Arabia, 9. Israel, 10. Egypt, 11. Libya, 12. Yemen, 13. Botswana, 14. Iran, 15. Jordan, 16. Chile, 17. San Marino, 18. Belgium, 19. Greece, 20. Tunisia, 21. Namibia, 22. South Africa, 23. Iraq, 24. India, 25. Syria
High (40-80%)	26. Mexico, 27. Morocco, 28. Eritrea, 29. Spain, 30. Algeria, 31. Pakistan, 32. Peru, 33. Turkmenistan, 34. Uzbekistan, 35. Thailand, 36. Andorra, 37. Albania, 38. Niger, 39. Turkey, 40. Afghanistan, 41. Italy, 42. Kyrgyzstan, 43. Portugal, 44. Nepal, 45. Djibouti, 46. Mongolia, 47. Macedonia

Source: World Resources Institute

Strategies

National water strategies include supply and demand management initiatives anchored on expanding supply to meet demand while meeting carbon emission reduction targets and ESG standards

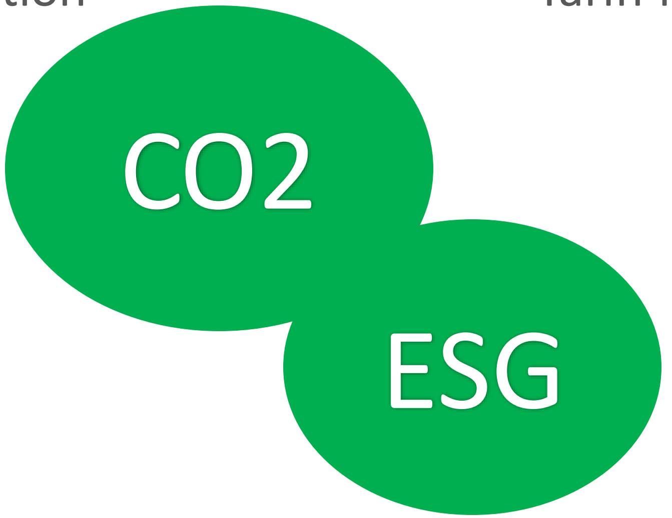
Supply management

Increase seawater desalination capacity

Enhance wastewater treatment and increase TSE reuse

Reduce water network losses, non-revenue water

Reduce groundwater or surface water reliance



Demand management

Tariff reforms

Use of water efficient appliances

Digitalisation

Privatisation/PPP

Increase storage capacity

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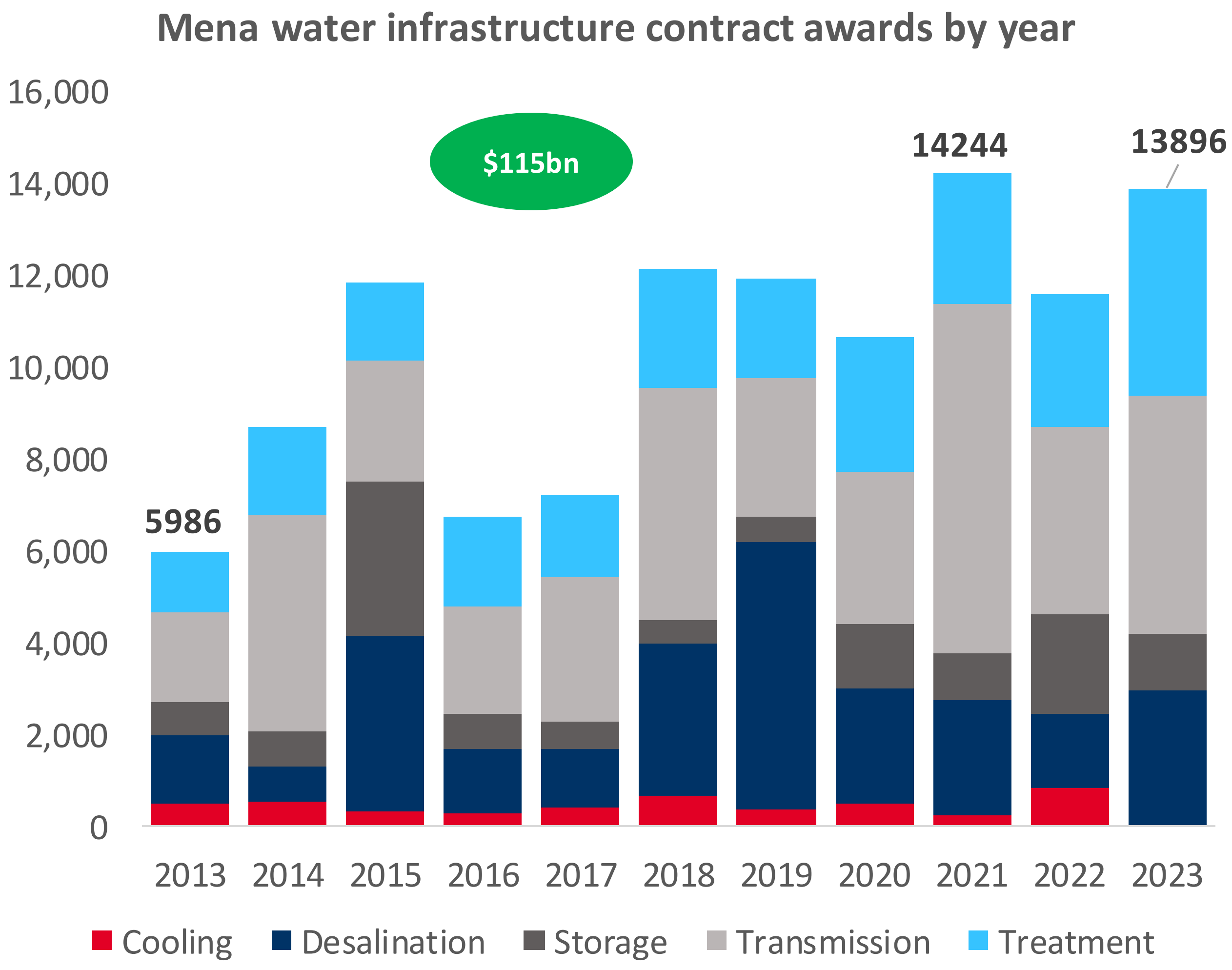
Historical expenditure

Contracts worth $115bn were awarded between 2013 and 2023, close to $14bn were awarded between January and September this year

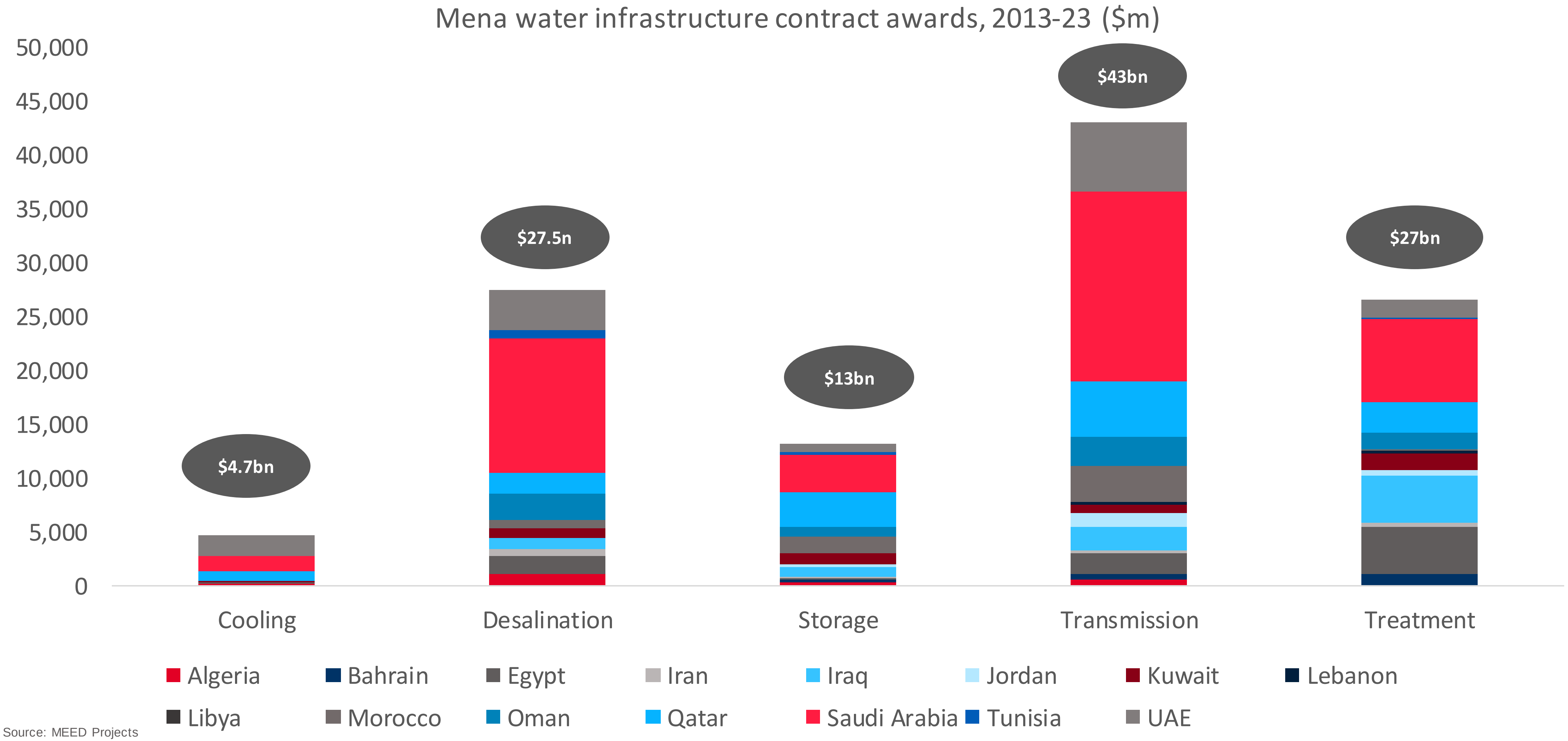


Project	Contract Value ($n
MAMF - Sais & Garet Water Conservation Project (Package III)	2,626
BOC/QatarEnergy - Iraq (CSSP): Water Treatment Plant	2,450
KAPP/MPW - Umm Al-Hayman Wastewater Treatment Plant Expansion	1,400
EWEC - Taweelah Reverse Osmosis IWP	1,395
BOC/QatarEnergy - Iraq Common Seawater Supply Project (CSSP): Pipelines	1,200
OWWSC - Sohar IWP	1,200
Ashghal - Al Wakrah and Al Wukair STP	1,186
Saudi Aramco/Bahri/Lamprell/HHI - KSIMC: Package 6	1,100
SWCC - Water Transmission System from Rabigh-Jeddah/Makkah Al-Mokarramah	834
DEWA - Hassyan SWRO Phase I (IWP)	731
SWCC - Jubail Desalination Plant Upgrade Phase 2	716
Rabigh Three Company - Rabigh 3 IWP	709
SWPC - Ar Rayis 1 Independent Water Plant	708
MWRI - Water Desalination Plant at Nile Dam	694
Saudi Aramco - Al Jafurah Desalination and Water Distribution Plant (IWP)	693
NAQA - Umm al Quwain IWP	680

Source: MEED Projects, 2023

Transmission projects and Saudi Arabia dominate

Transmission contracts account for the largest share of awarded contracts; Saudi Arabia accounted for the largest share (over $42bn)



Source: MEED Projects

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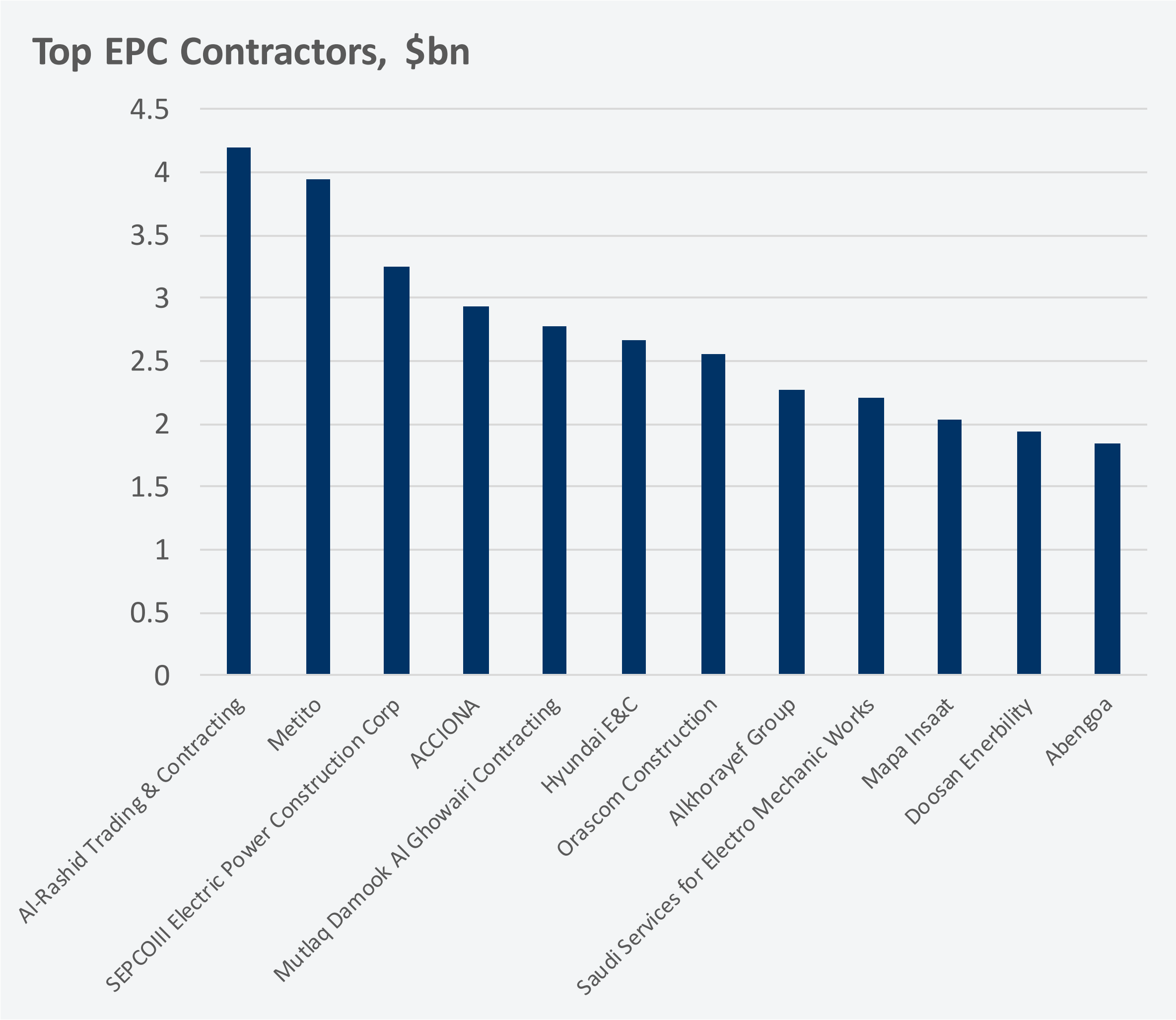
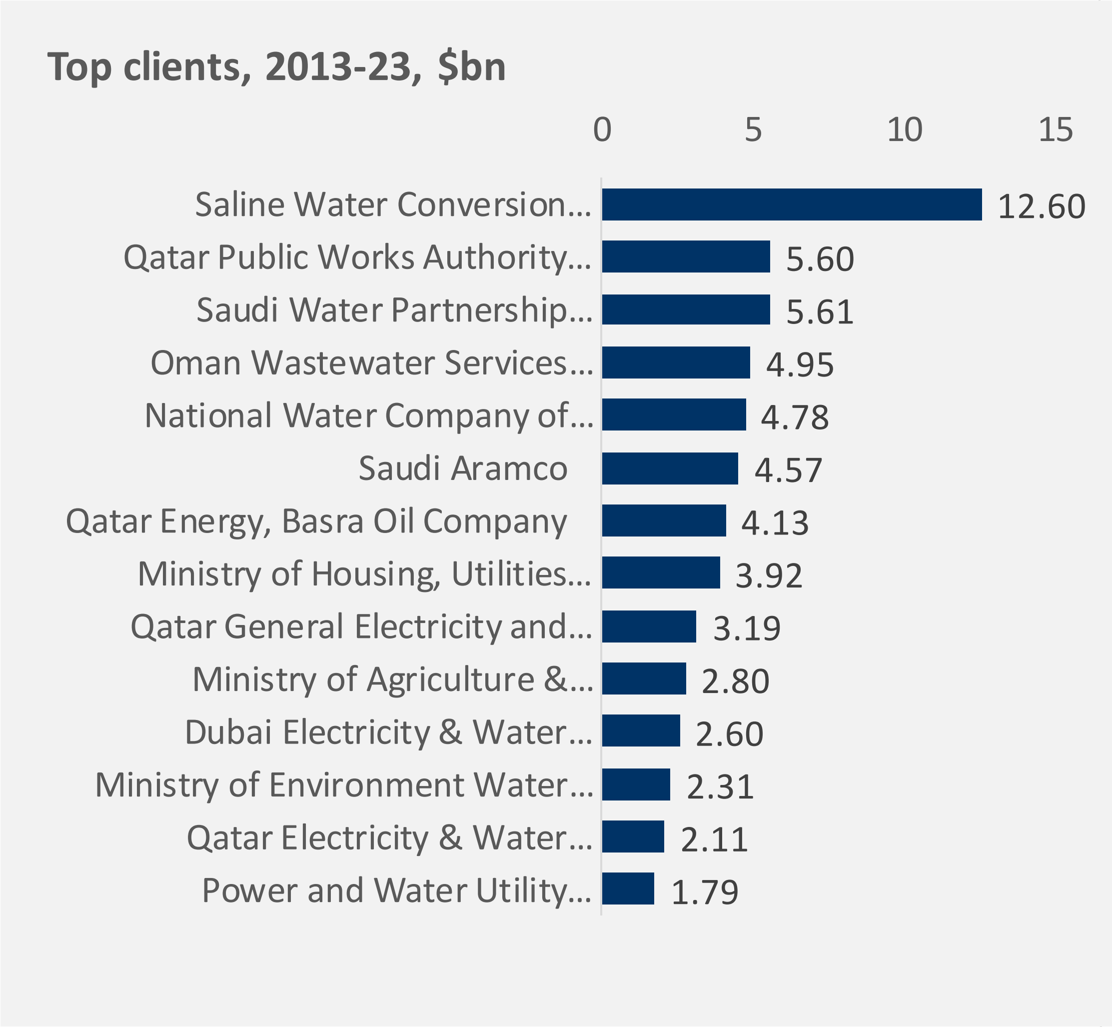
Top contractors and clients

Saudi Arabia's RTCC, Metito and China's SEPCO III are the top EPC contractors while SWCC is by far the largest client in terms of value of contracts awarded during the 11-year period





Source: MEED Projects

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Desalination sector

Desalination: key themes

Desalination addresses demand and supply gap for potable water, minimises reliance on limited ground and surface water, fuels industrial expansion but it is an energy-intensive process that produces brine

Bigger is better Taweelah SWRO IWP in Abu Dhabi (909,000 cm/d) – drives economies of scale, low tariffs; Hassyan IWP (818,000 cm/d, inset)

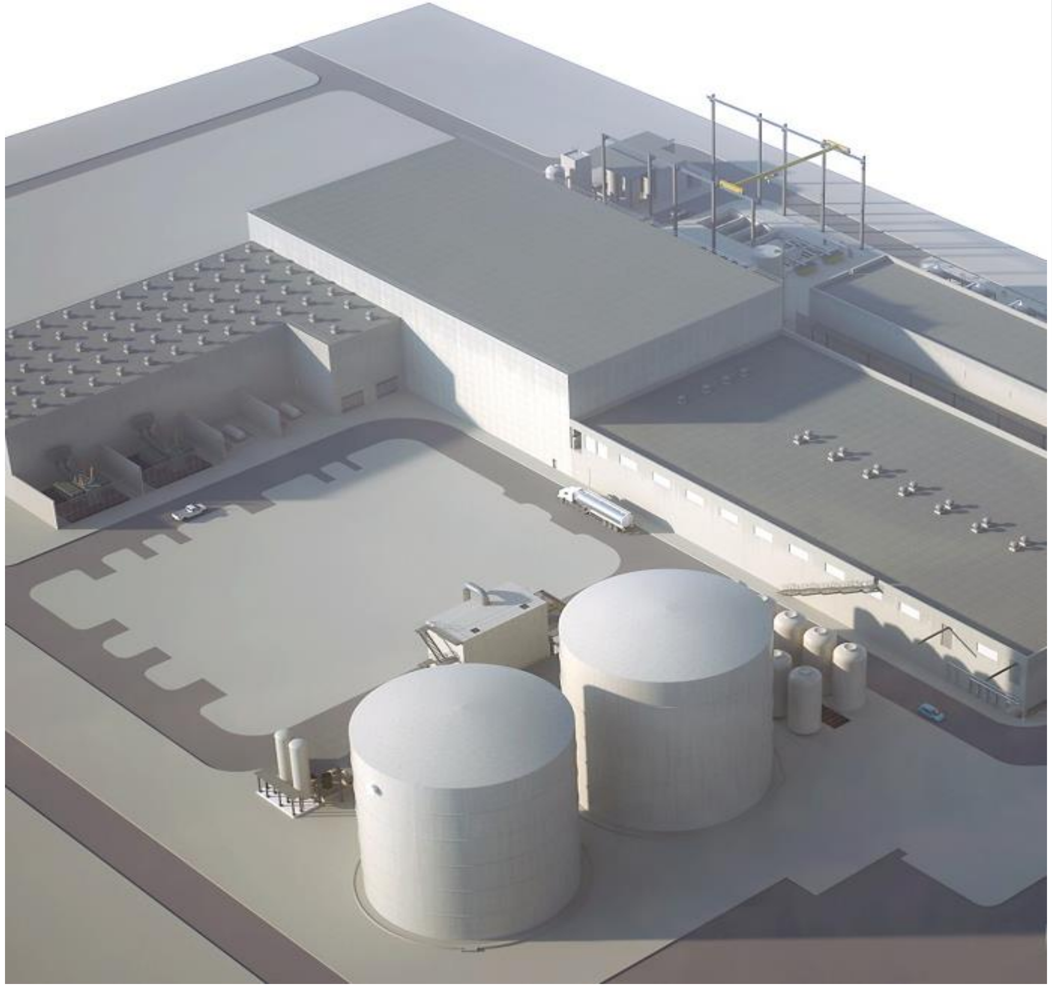
RO is king Carbon emissions reduction targets have led to decoupling of power and water production, increased adoption of reverse osmosis technology, dismantling/decommissioning of plants running on MSF/MED

Energy efficiency– SWPC has reduced specific power consumption (SPC) from 3.5 to 3.2 kilowatt-hour a cubic metre

Privatisation/PPPs

Innovation Digital twins/digitalisation/ remote sensors

Zero liquid discharge or ZLD being the next major technological development in the water business (Enowa)



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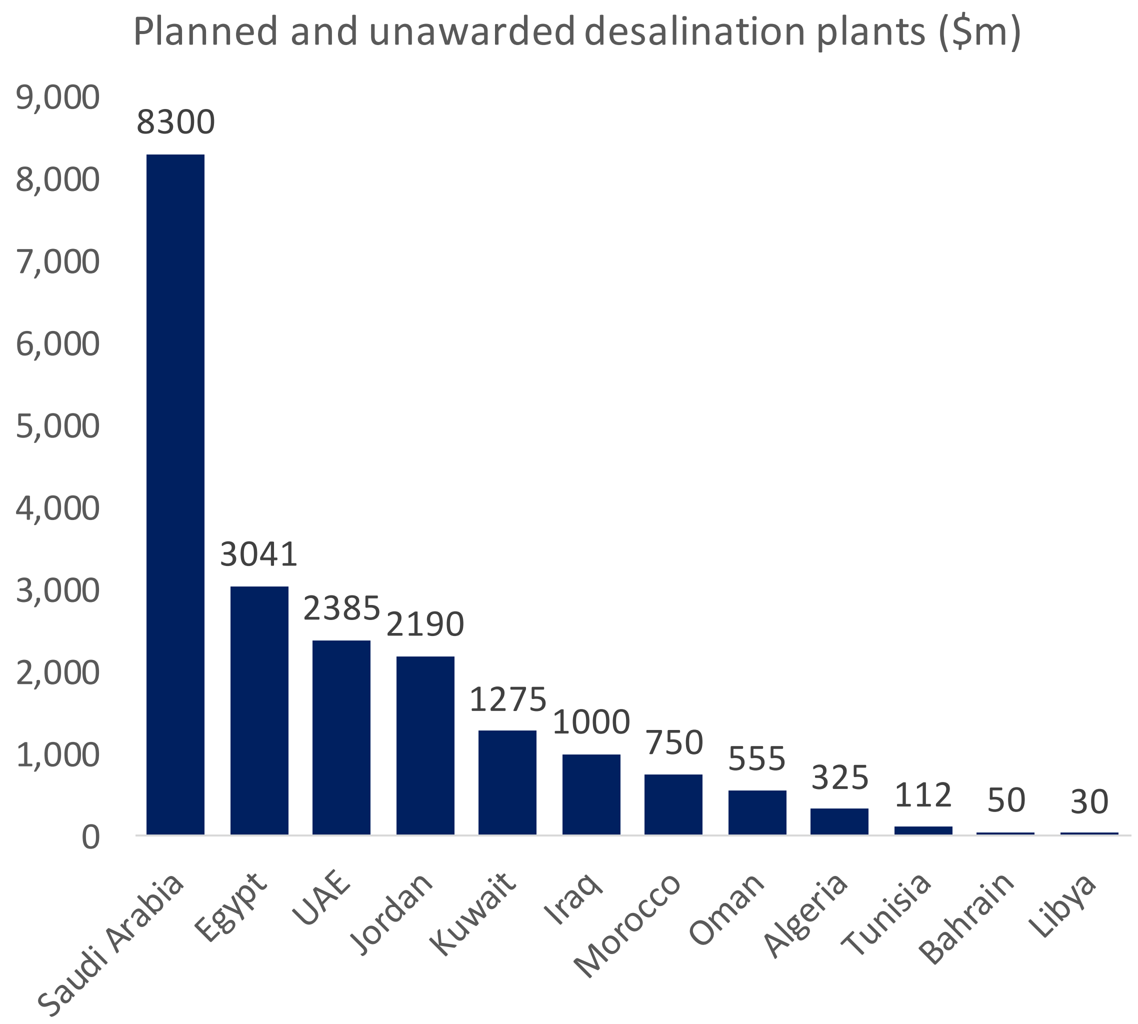
Desalination: planned and unawarded

- Known and planned unawarded water desalination projects are valued at an estimated $20bn. Saudi Arabia accounts for 41 per cent ($8.3bn).



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Desalination: Saudi Arabia

- SWCC remains the world largest producer of desalinated water, assets expected to be transferred to a PIF subsidiary Water Solutions Company. SWPC plans to procure 3.5 million cm/d of capacity based on its 2022-28 plan, exclusive of Ras Mohaisen

Table 1: SWPC Desalination Capacity Plan

Supply Group	Plant	COD	Capacity (m^3/d)
Eastern Riyadh, Qassim and Eastern Region)	Jubail 6 & 4	2027	600,000
	Ras Al Khair 2	2027	600,000
	Ras Al Khair 3	2027	400,000
Western (Makkah, Madinah, Baha, Tabuk)	Al-Rays 2	2027	300,000
	Tabuk 1	2027	400,000
	Rabigh 5	2029	400,000
Southern (Jazan, Assir)	Shuqaiq 4	2026	400,000
	Jazan 1	2026	400,000
Total capacity (m^3/d)			3,500,000

Source: MEWA

MEWA targets

2024 : 11.35m cm/d (gap: 1.85m cm/d)
2028: 15.82m cm/d (surplus: .7m cm/d)

SWCC capacity

2022:6.6m cm/d
Under const: 1.4m cm/d
Under bid: .65m cm/d

SWPC capacity

2022 :1.05m cm/d
Under const: 2.8m cm/d
Under bid: .9m cm/d

Desalination: Other countries

- Nearly every country has a national water strategy that aims to boost water security driving future investments in the sector

DEWA target

2023: 2.23 million cm/d
2030: 3.4 million cm/d
To be awarded: Hassyan 1 IWP (818,000 cm/d)
Dewa plans to produce 100 per cent desalinated water from a mix of clean energy and waste heat by 2030

Egypt (HCCW, Nuca)

2025: 3.5 million cm/d
2050: 8.85 million cm/d
100 desalination plants between 2020 and 2030
Tender for first batch of IWPs this year

Jordan (MWI)

$2bn Aqaba-Amman Water Conveyance and Desalination plant – bids due in early December

Morocco

Morocco's National Water Plan 2020-50 (**$11bn budget**); Grand Casablanca first major IWP

EWEC

2023 capacity : 4.8 million cm/d
Under construction and bid: 1.32 million cm/d (Mirfa 2, Shuweihat 4, Abu Dhabi Islands)

2022 demand : 3.64 million cm/d
2023: 3.47 million cm/d (commissioning of 150MIGD Umm al-Quwain IWP
2029: 3.66 million cm/d
Completed this year: Taweela RO (909,000 cm/d)

Neom/Enowa

Zero-liquid discharge SWRO plant catering to the development. Japan's Itochu and France's Veolia are expected to tender the project's EPC package soon.

Desalination: tariffs

- No clear trend for IWP levelised water cost: electricity cost, sovereign credit rating, project structure, WPA terms, capacity

Project	Tariff ($c/cm)	Capacity (cm/d)	Investment ($m)	Developers	EPC contractors	WPA duration
Rabigh 3 (Saudi Arabia, 2019)	0.530	600,000	687	Acwa Power, Saudi Brothers Commercial Company	Abengoa, Sidem, Sepco 3	25
Shuqaiq 3 (Saudi Arabia, 2019)	0.520	450,000	500	Marubeni, Abdul Latif Jameel	Acciona	25
Taweelah (UAE, 2019)	0.495	909,000	847	Acwa Power	Sepco 3, Abengoa	30
Yanbu 4 (Ar-Rayis 1) (Saudi Arabia, 2020)	0.473	450,000	850	Engie, Mowah, Nesma	Doosan Heavy Industries	25
Jubail 3A (Saudi Arabia, 2020)	0.413	600,000	650	Acwa Power, GIC, Al-Bawani	Sepco 3, Power China, Abengoa	25
Jubail 3B (Saudi Arabia, 2021)	0.424	570,000	693	Engie, Nesma, Alajlan	Acciona, Sepco 3	25
Mirfa 2 (UAE, 2023)	0.483	545,530	620	Engie	Veolia (Sidem)	30
Shuweihat 4 (UAE)	0.564	318,225	na	GS Inima	GS Inima	30
Rabigh 4 (Saudi Arabia, 2023)	0.458	600,000	677	Acwa Power, Haaco, Almoayyed	Power China, Sepco 3, Wetico	25
Hassyan 1* (UAE, 2023)	0.365	818,280	914	Acwa Power	Sepco 3, Sidem	30

*Not yet officially awarded

Selected unawarded projects

- Top projects to watch out for in the next 12 months include SWPC's IWP schemes, major projects in Egypt, Jordan, Neom

Project	Country	Value ($m)	Status
MWI - Aqaba-Amman Water Desalination and Conveyance (AAWDCP)	Jordan	2,000	Main Contract Bid
ENOWA - NEOM City: Water Desalination Plant (IWP) : Phase I	Saudi Arabia	1,000	FEED
SWCC - Yanbu Production System Phase 2	Saudi Arabia	750	Main Contract Bid
SWCC - Yanbu SWRO Phase 2	Saudi Arabia	600	Bid Evaluation
SWPC - Jubail 4 & 6 IWP	Saudi Arabia	600	Main Contract PQ
ONEE - Casa-Settat: Casablanca Seawater Desalination Plant	Morocco	500	Bid Evaluation
MEW - Doha SWRO Desalination Plant Phase 2	Kuwait	432	Bid Evaluation
EWEC - Saadiyat and Hudayriat Island 7 and 8 IWP (SWRO)	UAE	400	Main Contract Bid
HCWW - Renewable-powered desalination plants, batch 1	Egypt	300	Design
SWPC - Ras Mohaisen IWP	Saudi Arabia	300	Main Contract Bid
SEWA - Hamriyah Independent Water Plant	UAE	150	Main Contract Bid
SWCC - Expansion of Ras Al-Khair production system: Seawater Desalination Plant	Saudi Arabia	150	Main Contract Bid
SWCC - Umm Lajj Desalination Plant	Saudi Arabia	100	Main Contract PQ

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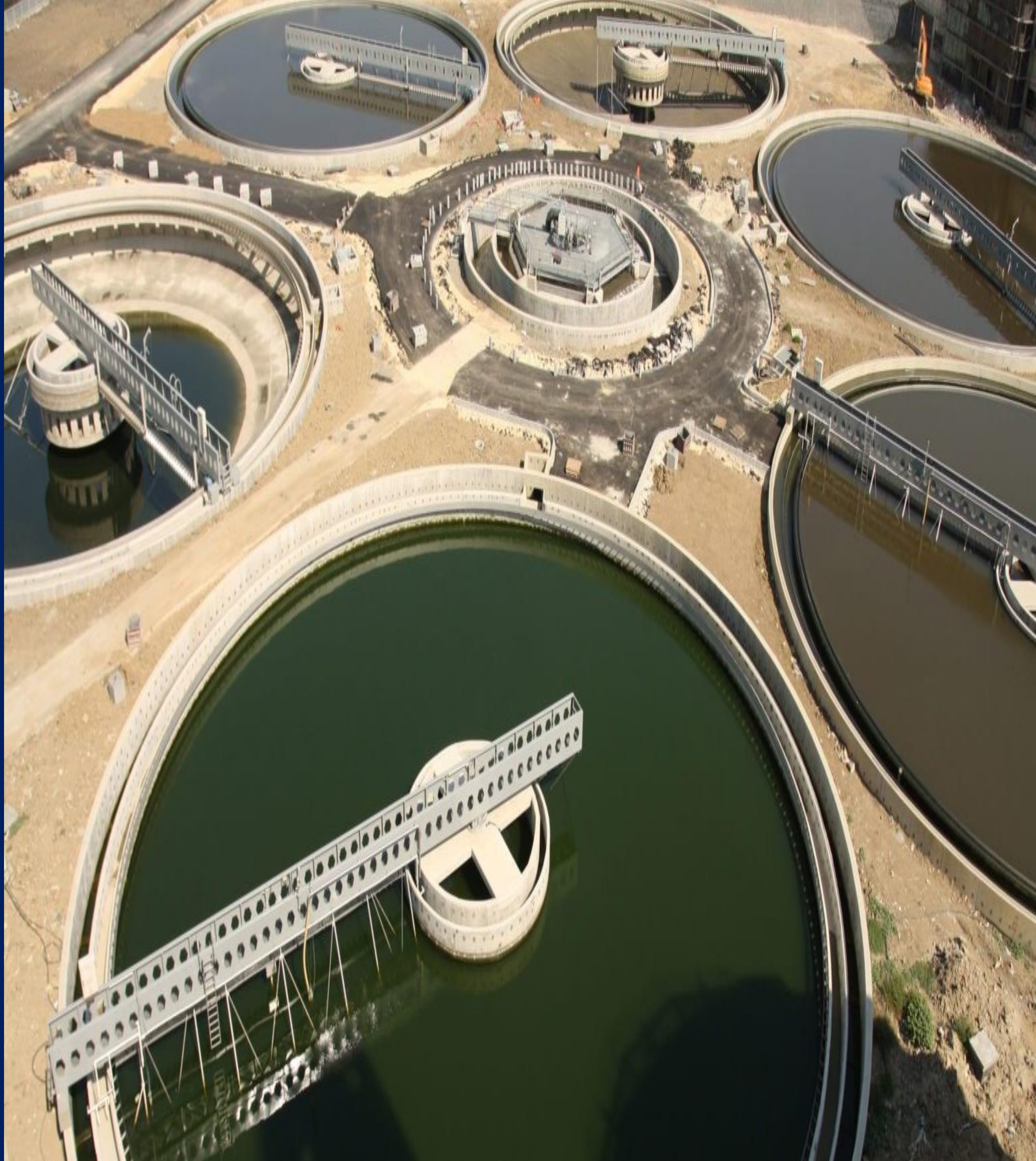
Wastewater sector



Wastewater: project updates

Investments support SDG, need to decarbonise sector, improve sanitation and support urbanisation; TSE reuse regulations vary

Qatar - Al Wakrah and Al Wukair STP - $1.2bn

Capacity: 150,000 cm/d – 600,000 cm/d
Pumping station, two deep-shaft structures, and a tunnel ventilation and odour-control facility
Completion: 2024
Contract model: BOT (25 years)

Kuwait
Umm al-Hayman WWTP (KW) - $1.7bn

Capacity: 500,000 cm/d – 700,000 cm/d
450km wastewater and TSE pipelines
Completion:2024
Contract model: BOT (25 years, WWTP) and EPC + 3-year O&M for canal) (WTE Wassertechnik)

Saudi Arabia
Manfouha (Riyadh) STP - $433m

Capacity: 700,000 cm/d (3 STP plants)
Completion: 2026
Contract model: EPC (Alkhorayef)

Saudi Arabia
Ras al-Khair package 6 - $1.1bn

Industrial wastewater treatment plant
Completion: 2023
Contract model: EPC (Sepco & Sinohydro)

Egypt
El-Hamam Agricultural Wastewater Treatment Plant - $591m

Capacity: 7.5million cm/d
Completion: 2024
Contract model: EPC (Hassan Allam, Metito the Arab Contractors, Gama)

Saudi Arabia
Batch 1 and 2 ISTPs

Capacity:600,000 cm/d (batch 1); 400,000 cm/d (batch 2)
Completion: ongoing
Contract model: BOO (25 years)

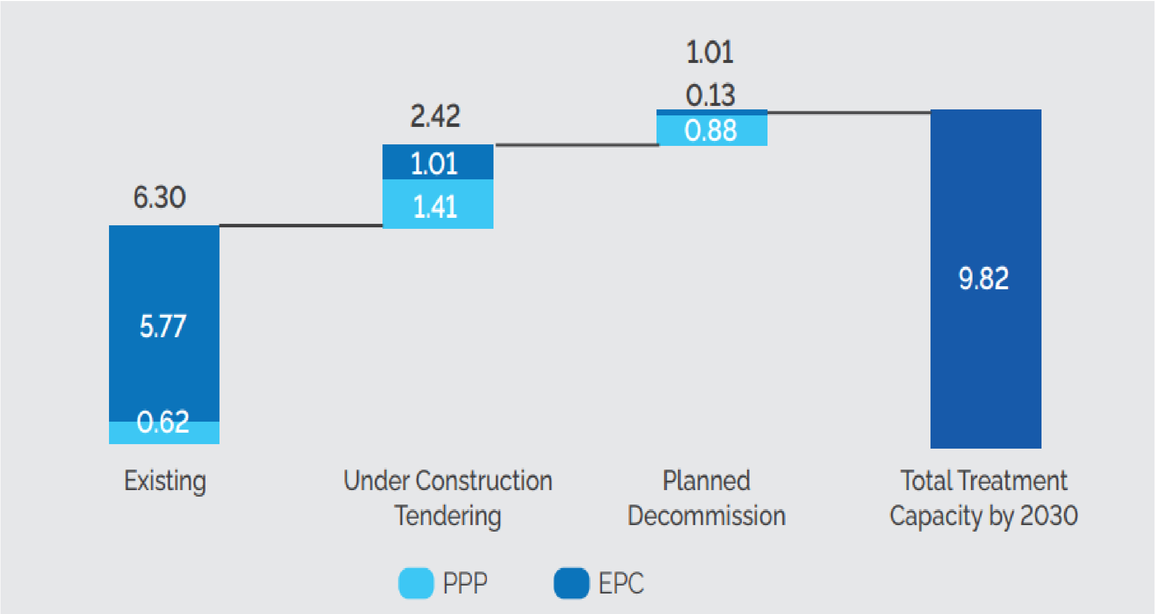
Saudi Arabia
Zuluf industrial WTP

Capacity: 185,000 cm/d
Completion:
Contract model: BOOT (25 years)

Wastewater : Saudi Arabia

- Saudi Arabia likely to be the most important market, aiming to reach 70 per cent TSE reuse by 2030

Saudi Arabia total wastewater treatment capacity by 2030 (million cm/d)



Source: MEWA, NWC

Wastewater network coverage 62% (2022) to 95% (2030)

TSE reuse 17% (2015) to 70% in 2030

Treated water production through strategic partners 100% by 2030

Population 50m by 2030

Wastewater production 10.8 million cm/d in 2030

Wastewater collection 9.8m cm/d in 2030

SWPC planned ISTP and SSTP projects

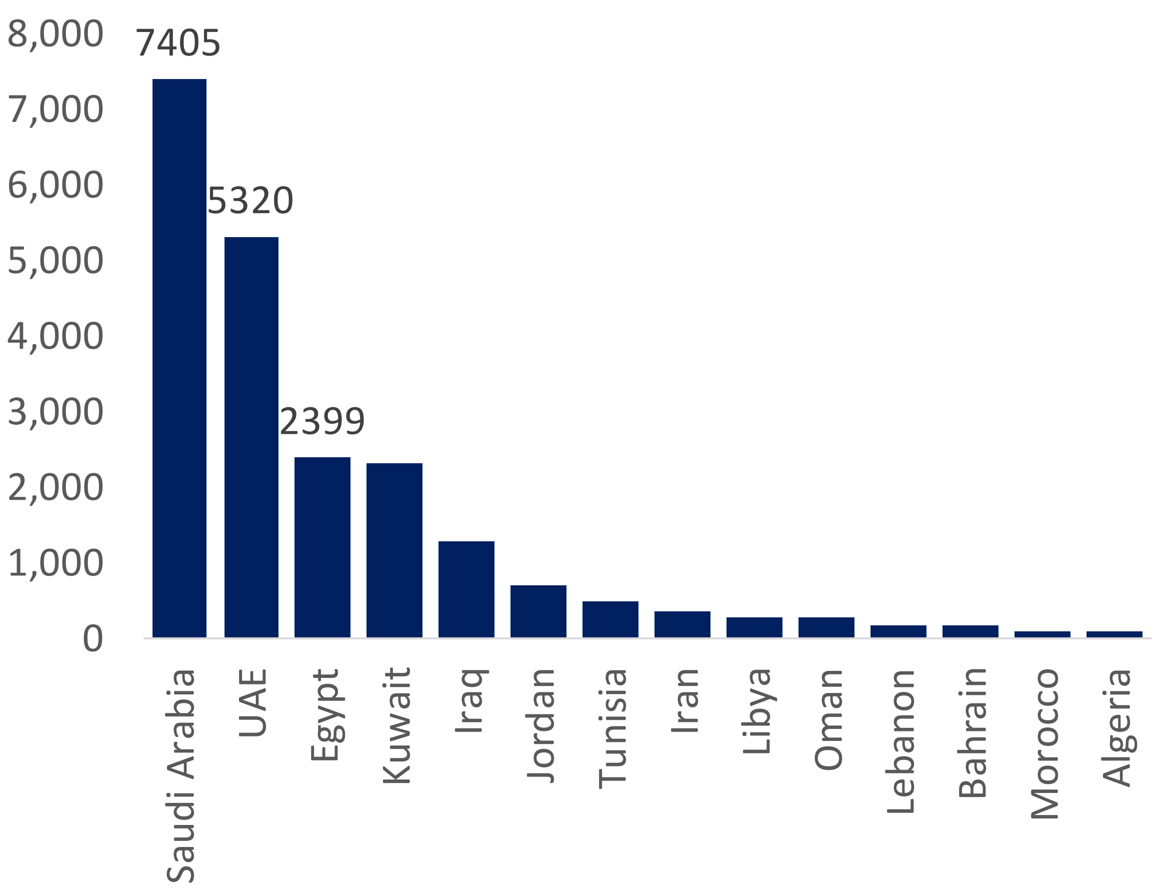
ISTP	Rabigh 5	Q3 2025	Q3 2025	Q4 2025	Q1 2026
ISTP	North Riyadh	Q1 2023	Q1 2023	Q2 2023	Q3 2023
ISTP	Hadda	Q2 2023	Q2 2023	Q3 2023	Q4 2023
ISTP	Al Haer 2	√	√	√	√
ISTP	Aranah	Q2 2023	Q2 2023	Q3 2023	Q4 2023
ISTP	Riyadh East	√	√	√	Q3 2023
ISTP	Abu Arish 3	Q2 2023	Q2 2023	Q3 2023	Q4 2023
ISTP	South Najran	Q4 2023	Q4 2023	Q4 2023	Q1 2024
ISTP	North Jeddah 1	Q1 2024	Q1 2024	Q2 2024	Q2 2024
ISTP	Hafar Al Batin 2	Q1 2024	Q1 2024	Q2 2024	Q3 2024
ISTP	Al Kharj 3	Q1 2024	Q1 2024	Q2 2024	Q3 2024
ISTP	Arar	Q1 2025	Q2 2025	Q3 2025	Q1 2025
Small STP	Jazan Cluster	√	√	√	√
Small STP	Western Cluster	√	Q1 2024	Q2 2024	Q3 2024
Small STP	Eastern Cluster	√	Q1 2024	Q2 2024	Q3 2024
Small STP	Northern Cluster	√	Q2 2024	Q3 2024	Q4 2024
Small STP	Northwestern Cluster	√	Q2 2024	Q3 2024	Q4 2024
Small STP	Central Cluster	√	Q2 2026	Q3 2026	Q4 2026
Small STP	Southern Cluster	√	Q3 2026	Q4 2026	Q1 2027

Source: MEED Projects

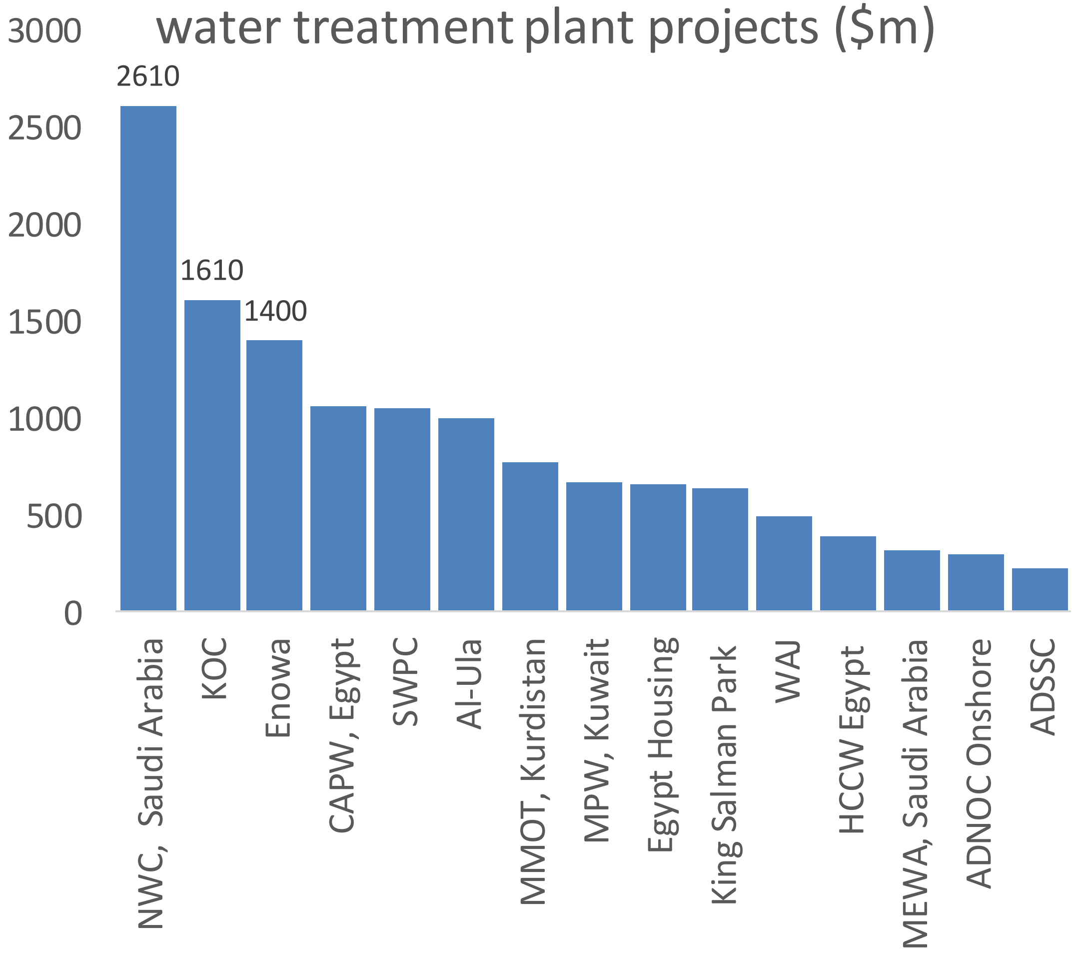
Wastewater: planned & unawarded projects

- Known planned and unawarded water treatment plant projects are estimated to be worth $21.3bn

Planned & unawarded water treatment plant projects ($m)



Top clients, planned & unawarded water treatment plant projects ($m)



Source: MEED Projects

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Wastewater: selected unawarded projects

- Top projects to watch out for over the next 12 months

Project	Country	Value ($m)	Status
NWC - Upgrade of Sewage Treatment Plants: 5 Packages	Saudi Arabia	2,150	Main Contract Bid
ADNOC - Al-Nouf Seawater Treatment Plant	UAE	2,000	Main Contract PQ
RCU - Al Ula Tourism Development: Infrastructure: Water Supply & Treatment Plant	Saudi Arabia	1,000	FEED
ENOWA - NEOM City: Oxagon Village Water Recycling Plant	Saudi Arabia	1,000	Main Contract PQ
KRG MOMT - Erbil Sewage Treatment Plant: Lot I	Iraq	778	Bid Evaluation
KSPF - King Salman Park: Water and Sewage Treatment Complex	Saudi Arabia	640	Bid Evaluation
MPW - Wastewater Treatment Plant in South Al-Mutlaa Area	Kuwait	578	Bid Evaluation
ENOWA - NEOM City: Water Desalination Plant (IWP) : Phase I	Saudi Arabia	400	FEED
CAPW - Gabal Al Asfar Wastewater Treatment Plant Expansion: Stage 3	Egypt	350	Main Contract PQ
CAPW - Helwan Wastewater Treatment Plant (WWTP) Expansion	Egypt	340	Study
CAPW - Alexandria West Wastewater Treatment Plant Extension and Upgrade	Egypt	209	Main Contract PQ
HCWW - Sewage Networks And Pump Stations For S.04 Villages (Contract B)	Egypt	156	Bid Evaluation
PetroChina/SOC/Petronas/TotalEnergies - CPF3 Produced Water Treatment System Expansion	Iraq	150	Bid Evaluation
MoW - Sewage Treatment Plant in Khalifa City	Bahrain	150	Main Contract PQ
MWI - Hisban Water Desalination and Conveyance	Jordan	150	Study
ADSSC - Treated Sewage Effluent (TSE) Polishing Plant in Al-Wathba	UAE	150	Bid Evaluation

Source: MEED Projects

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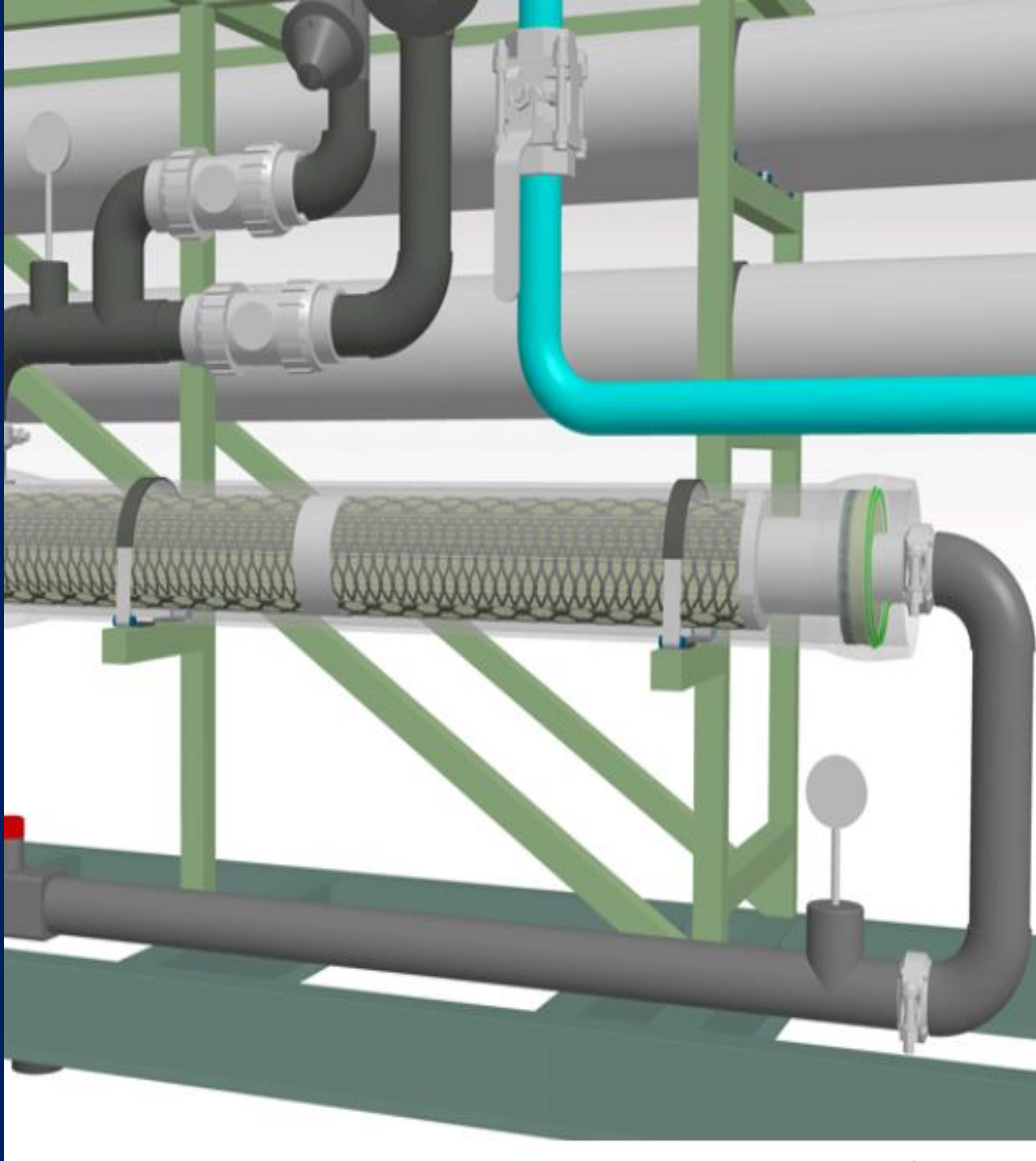
Water transmission & reservoir



Mena Water & Wastewater 2023 – Cooling, storage & transmission

Cooling

Awarded contracts, 2013-23: $4.7bn
Planned and unawarded contracts:

$1.25bn

Storage

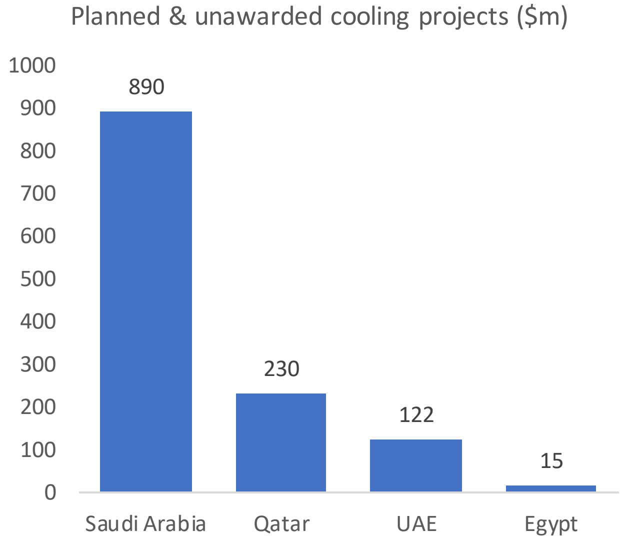
Awarded contracts, 2013-23: $13.1bn
Planned and unawarded contracts:

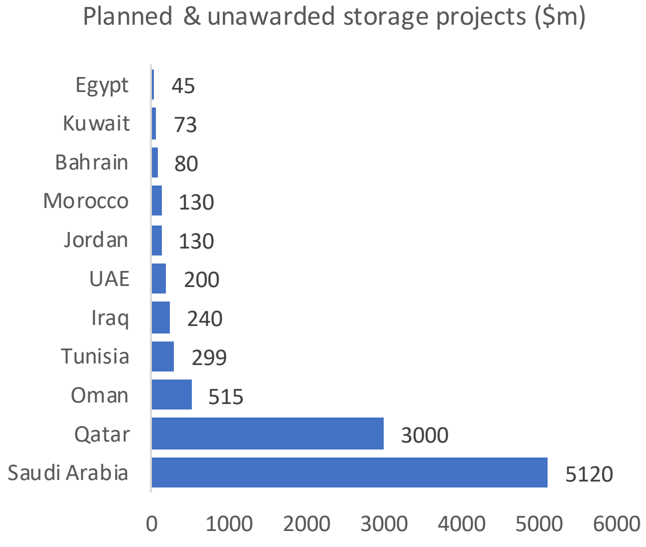
$9.8bn

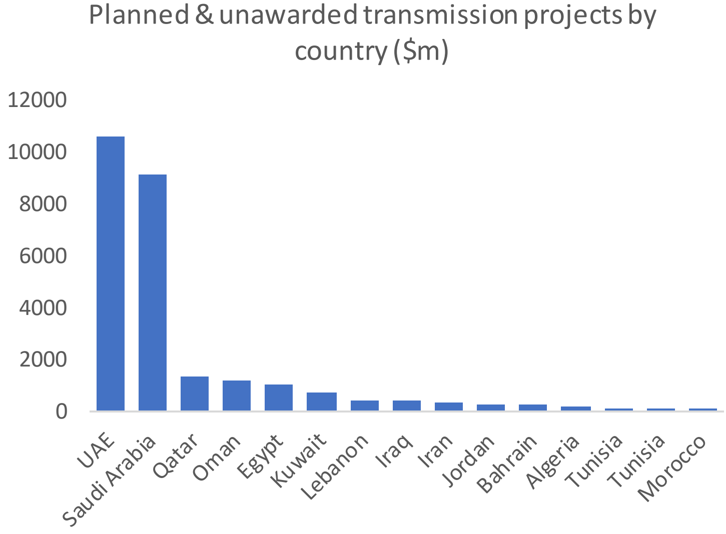
Transmission

Awarded contracts, 2013-23: $43bn
Planned and unawarded contracts:

$25.5bn







Source: MEED Projects

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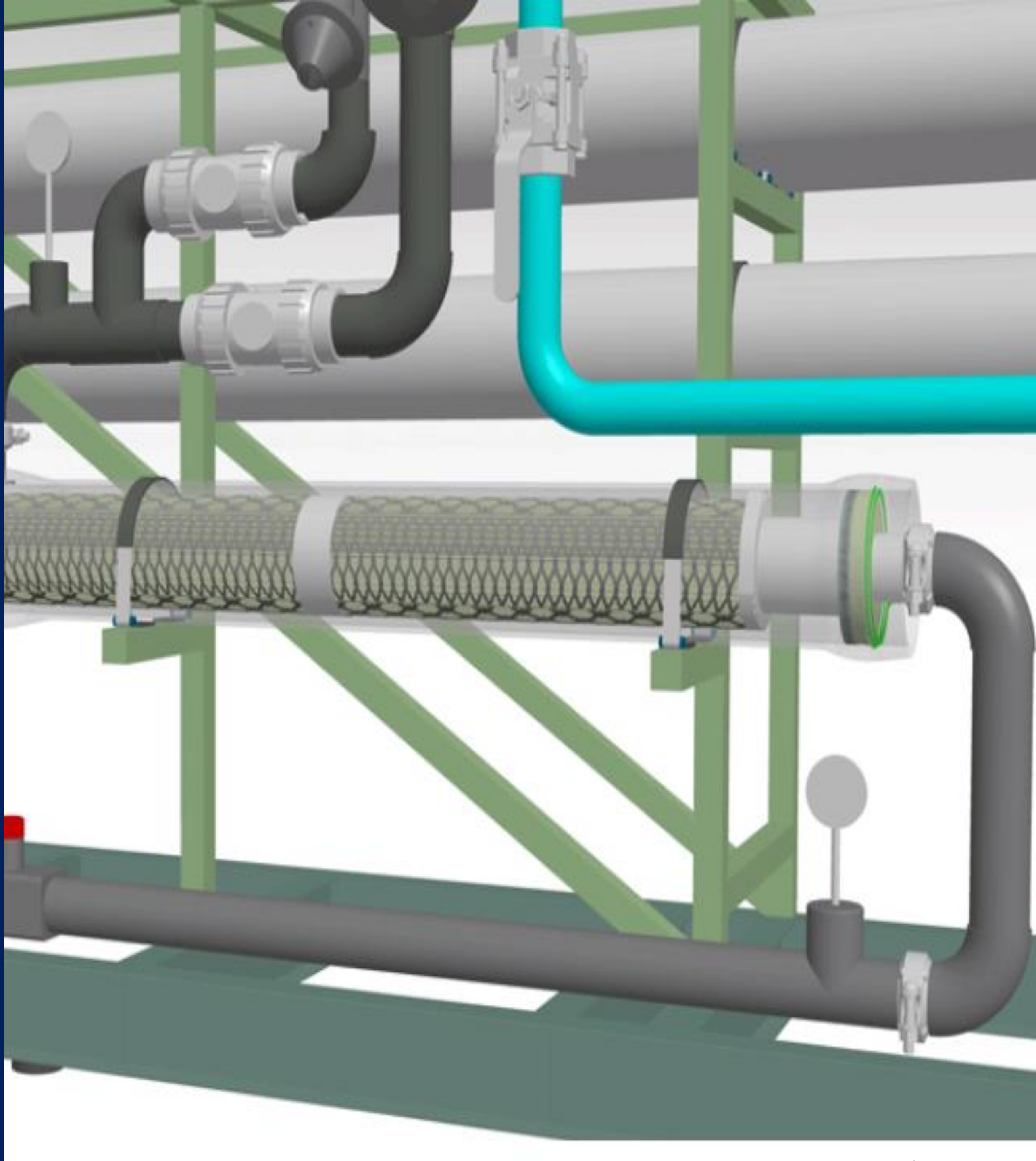
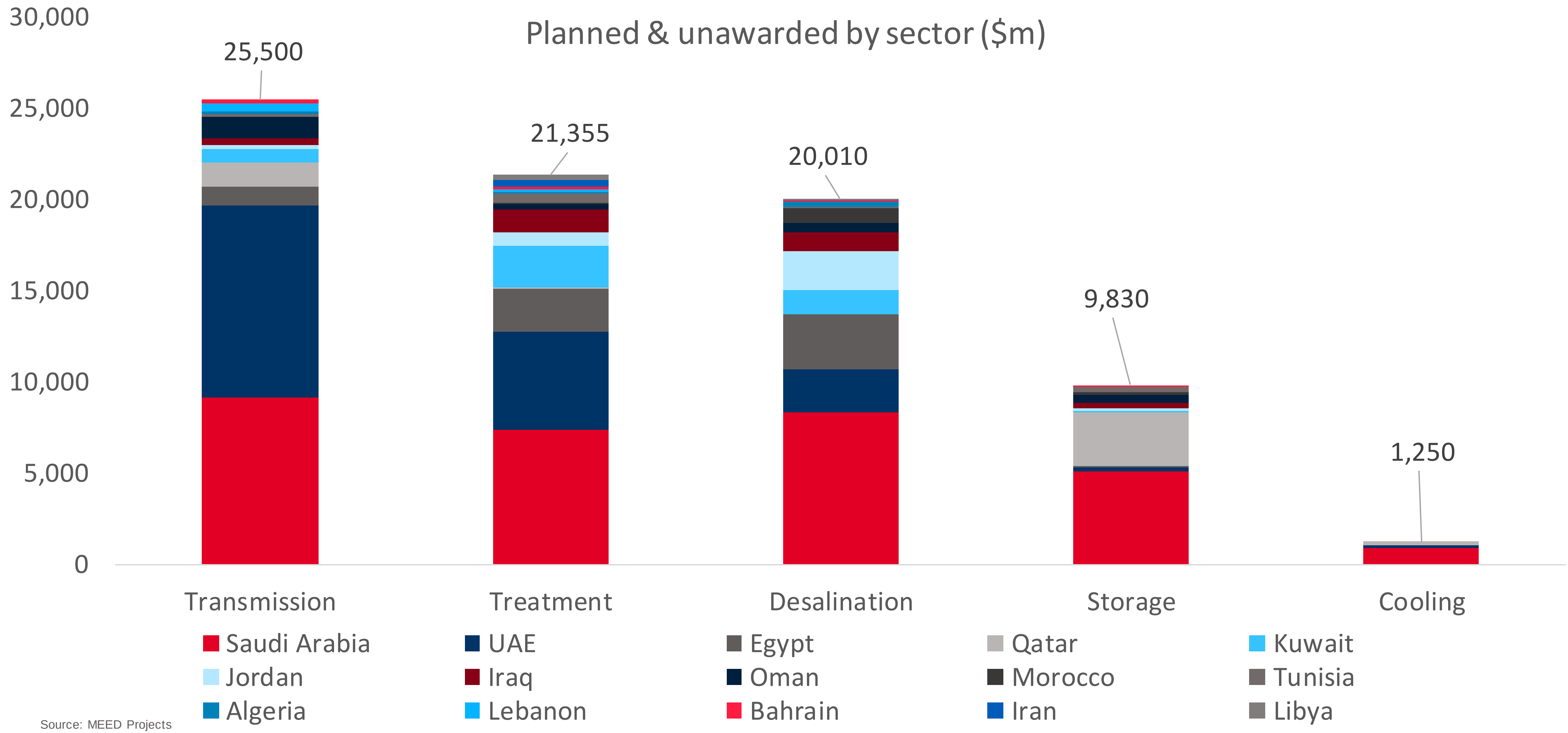
Summary



Mena Water & Wastewater 2023: future opportunities

- Some $77bn schemes are in pre-execution phase; of these $29bn are in advance procurement stage



Source: MEED Projects

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Mena Water & Wastewater 2023

Water insecurity offers substantial business and investment opportunities **($77bn)** and opportunities to **innovate**

Saudi Arabia remains the largest market, followed by the UAE & other GCC states, Egypt, Iraq, Morocco

Long term economic and **water agenda** – and their implementation - are crucial to future investments

Main issue is how to make water scarcity solutions (e.g desalination, TSE) contribute less to the problem (**carbon emissions**)

Stronger **demand management** measures

Regulations (TSE, district cooling) may need to be place

Bigger role for the **private sector**

Levelised water cost has scope to rise/fall subject to multiple variables

Source: MEED Projects

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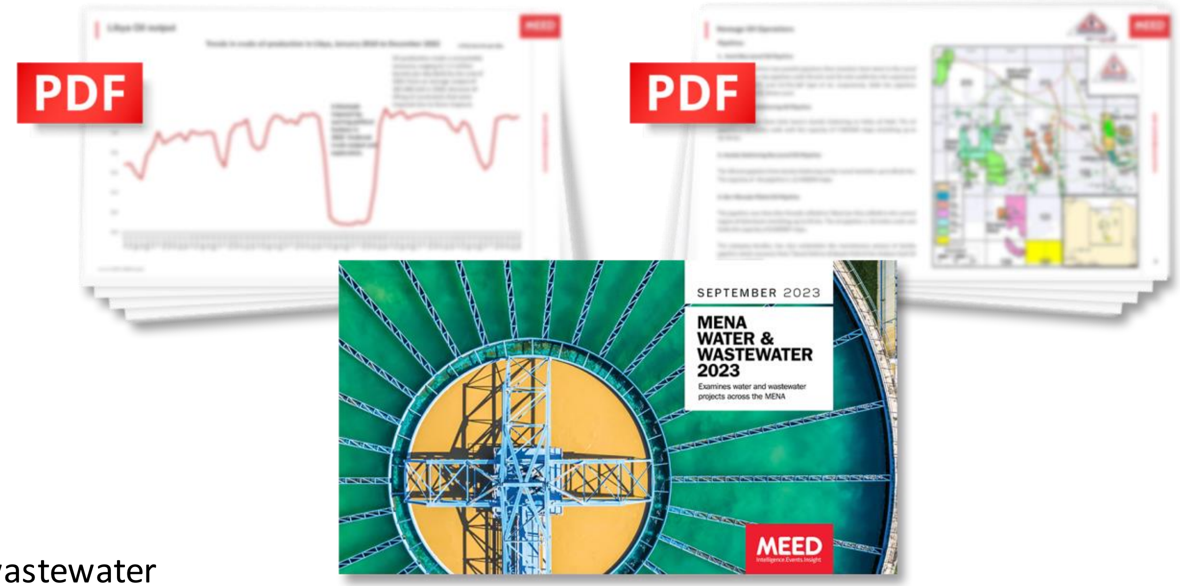

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Q&A

Do you have any questions?

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