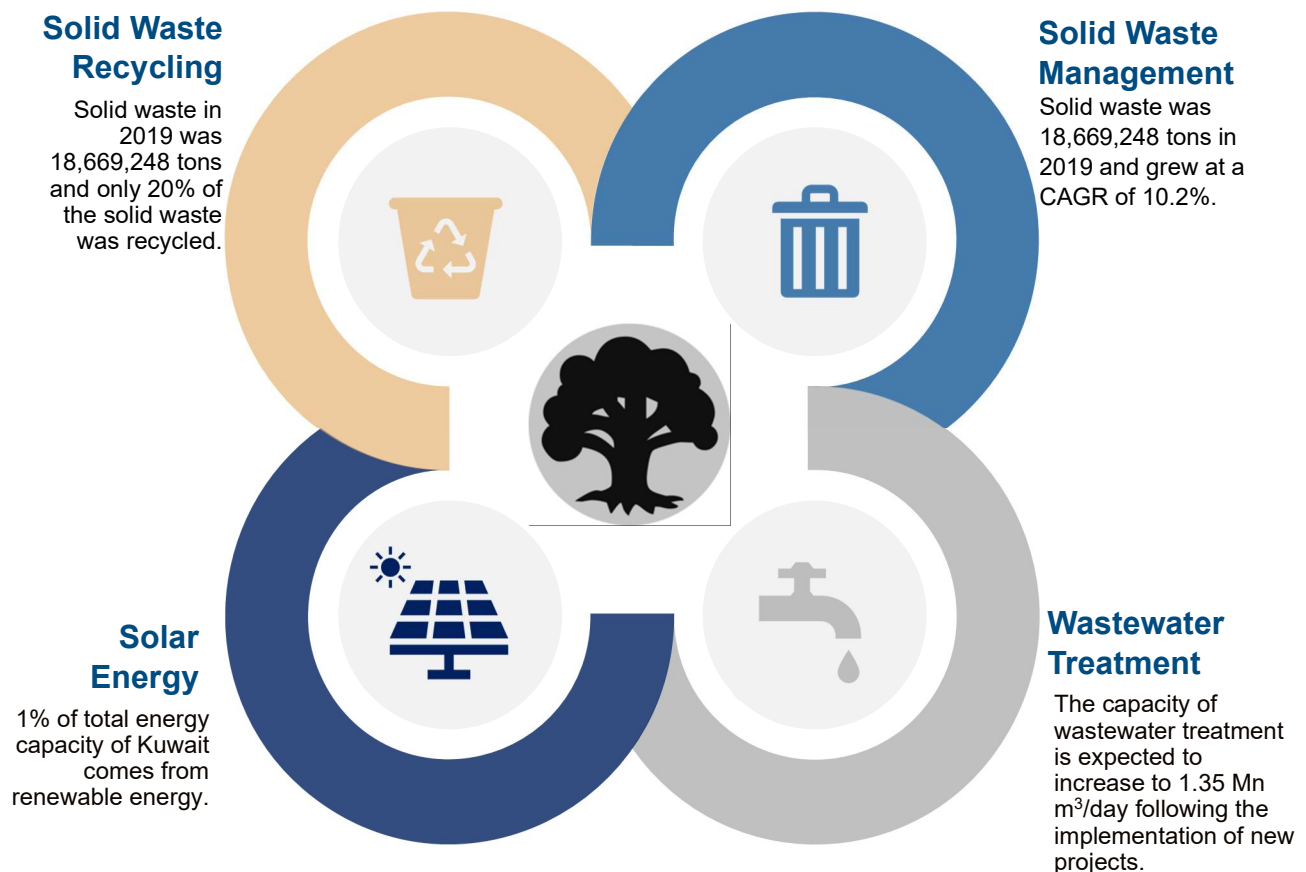


3.2 Environmental Services (Renewable Energy and Clean Technology) Sector

Sector Overview

Environmental projects undertaken by Kuwait are a step taken in the right direction for reducing carbon emissions of the country and ensure the protection of the natural environment. It also signifies Kuwait's commitment globally to utilize green forms of energy and reduce dependence on fuel-based sources of energy. Most of the projects undertaken in this sector require international expertise as the segment is in a very early stage in Kuwait.

SUBSECTORS



Considering the continuous adoption of new environmental projects in the country and the limited availability of specialized players in the local market for providing similar services, it creates a good opportunity for specialized foreign investors to participate in the segment.

3.2.1 Solid Waste Management

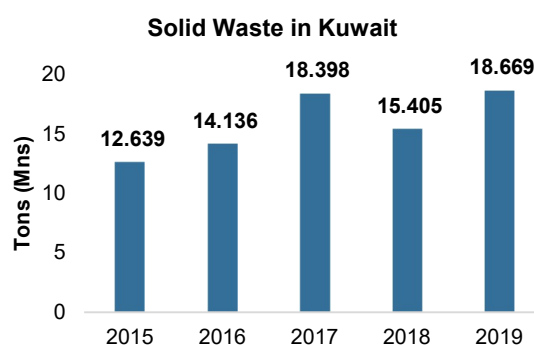
Solid waste management is the process of collecting, treating, and disposing of solid waste.

OVERVIEW AND FACTORS INFLUENCING THE MARKET

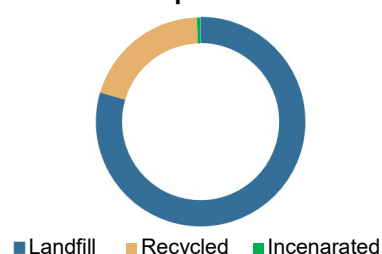
- The growing population of Kuwait and the rising infrastructure and construction activities in the country have caused Kuwait to accumulate rising amounts of solid waste placing it in the top 3 countries within the GCC.¹
- As per the latest available data, Kuwait's total solid waste amounted to 18,669,248 tons in 2019 which grew at a CAGR of 10.2% from a base of 12,639,459 tons in 2015.²
- Most of the solid waste in Kuwait is dumped into landfills.

Some of the areas are as below²:

Location	Size (Million sqm)
Jahra	1.915
South Seventh Ring	5.358
Mina Abdullah	6.7
Other	6.0



Waste Disposal Method



- Kuwait has one of the largest recyclable tire reserves in the world containing approximately 50 Mn tires. Often these tires cause fire hazards that release toxic fumes into the atmosphere.
- In order to address the issue of the disposal of solid waste, the Kuwaiti Municipality, in line with the government's Kuwait Vision 2035 Development Plan, licensed a Solid Waste Treatment Facility in Kabd area on a PPP basis. The solid waste treatment plant has a capacity of 3,275 tons per day and is estimated to cost approximately USD 1,926.9 Mn.³

OPPORTUNITIES AND INVESTMENT CONSIDERATIONS

- Kuwait's solid waste is expected to increase at a much more rapid pace in the coming period, far outpacing the past growth of 10.2%. This is expected because of the growing population and fast-paced construction projects.
- The Environment Public Authority of Kuwait, established in 1995, had issued a new environmental protection law in 2014 thereby ensuring a strict adherence to the regulations prescribed in the law. The law is expected to create further opportunities in the sector by ensuring that no unlawful dumping of harmful solid waste happens in Kuwait.
- Based on a study published by Global Recycling magazine in 2016 on an "Integrated Solid Waste Management System", installing seven recycling plants in Kuwait could help recycle 95% of waste tires and organic waste, 90% of construction and demolition waste, glass, and metal, 80% of paper and 50% of plastic. The remaining non-recyclable materials would be sent to a sanitary landfill.⁴

- Thus, attractive opportunities exist for foreign investors who specialize in solid waste management to move into the sector. Opportunities exist not just in waste management solutions but also soil remediation solutions for existing landfills.

Source: ¹International Journal of Environmental Science and Development, ²CSB, ³KAPP, ⁴Global Recycling



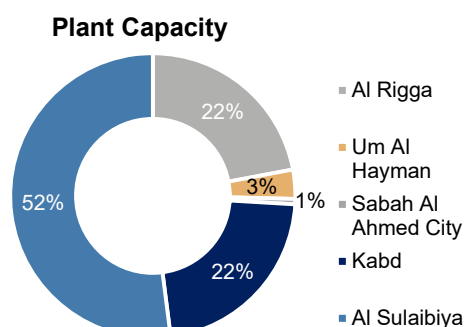
3.2.2 Wastewater Treatment

Wastewater treatment is the process of removing contaminants from sewage and any other contaminated water and treating it in such a way that it can be released back into the natural environment without causing any harm or damage to it.

OVERVIEW AND FACTORS INFLUENCING THE MARKET

- Kuwait is one of the largest consumers of water in the world. The per capita water consumption per year was 35,857 IG per year in 2020.¹ The water tariffs in Kuwait are one of the lowest in the world with- water being subsidized substantially by the government. This has encouraged extravagant utilization of water and has caused maximum wastage.
- Kuwait has 5 household wastewater treatment plants with a maximum capacity of 817,000 m³/d.¹ They include the below:

Treatment Plants	Operating Year	Design Capacity (1000 m ³ /day)	Average Water Treatment (1000 m ³ /day)
Al Rigga	1982	180,000	151,558
Um Al Hayman	2001	27,000	24,300
Kabd	2011	180,000	145,000
Al Sulaibiya	2004	425,000	350,000
Sabah Al Ahmed Sea City	2020	5,000	-
Total		817,000	



Al Wafra station having a capacity of 6,000 m³/day is currently out of operation. On the other hand, Al Khairan Station with a capacity of 5,600 m³/day is not yet operational.

- The government is actively seeking the participation of the private sector in wastewater treatment projects and had previously operated Al Sulaibiya and Kabd projects successfully on a PPP basis. Currently, a new plant is proposed at Um Al Hayman with a capacity of 500,000 m³/d which is being developed through Kuwait Authority for Partnership Projects (KAPP) on a PPP basis.²
- Further, the government of Kuwait is pursuing the increase of the capacity of Al Sulaibiya and Kabd plants to 600,000 m³/d and 250,000 m³/d respectively.³

OPPORTUNITIES AND INVESTMENT CONSIDERATIONS

- The utilization of water is expected to rise in Kuwait with the growing population and the rise in infrastructural activities. A direct consequence of this will be a massive increase in wastewater in the country.
- Kuwait's wastewater provides an opportunity for the country to reutilize this resource considering its limited access to fresh water from the land and the very expensive desalination process of water retrieved from the sea.
- The governments proposition to increase the capacity of wastewater treatment in the country through private sector participation provides immense potential for foreign investors to participate in the sector.

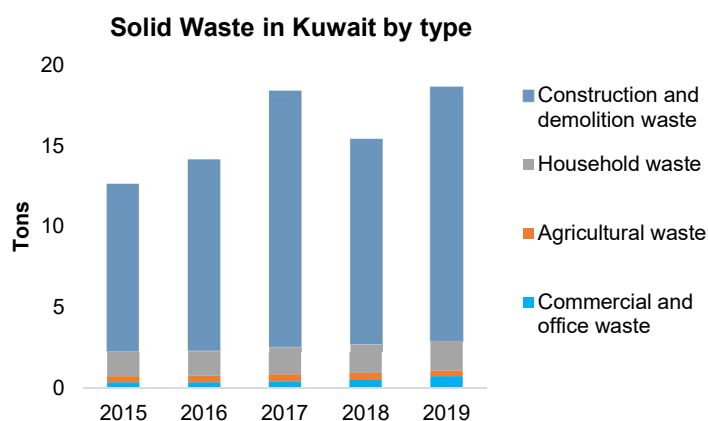
Source: ¹CSB, ²KAPP, ³KDIPA

3.2.3 Solid Waste Recycling

Solid Waste recycling is the process of retrieving used discarded products or certain used resources that can be reused thereby helping to conserve resources and reduce the pollution of the environment.

OVERVIEW AND FACTORS INFLUENCING THE MARKET

- Kuwait generates a huge amount of solid waste annually. It is estimated that the solid waste produced by Kuwait in 2019 was 18,669,248 tons.¹ Only 20% of the solid waste is recycled in Kuwait. The remaining waste is dumped in landfills which cause irreparable damage to the soil while releasing toxic fumes into the atmosphere.



- 84%¹ of the waste produced comprised of construction waste. Construction waste includes concrete, bricks, ceramic, insulation materials, glass, plastic and metal, none of which are biodegradable.
- Household waste is the second largest generator of solid waste in the country at 10%¹ of the total waste produced. Household waste comprised of biodegradable waste such as paper and wood as well as non-biodegradable waste including plastics.
- The Environment Public Authority of Kuwait is the chief enforcer of environmental laws and regulations in the country is entrusted with the task of ensuring that waste is handled with care and is considered for recycling.²
- Some private players exist in the market that provide recycling for metal and plastic components, however there is a great demand in the market for recycling facilities related to other waste including wood and paper.

OPPORTUNITIES AND INVESTMENT CONSIDERATIONS

- Kuwait's infrastructure is undergoing drastic change in order to realize its vision as a diversified economy away from the dependence on oil. This infrastructural development is bound to create a lot of construction related waste that needs to be dealt with considerably. Kuwait's expected population increase will also cause a drastic increase in the amount of waste produced.
- Hence, there is major opportunity for private participants to enter into the sector and undertake activities related to recycling. Considering the fact that recycling is not a cost intensive process, foreign investors stand to gain substantial revenue and profits where they can employ their advanced expertise in this domain.

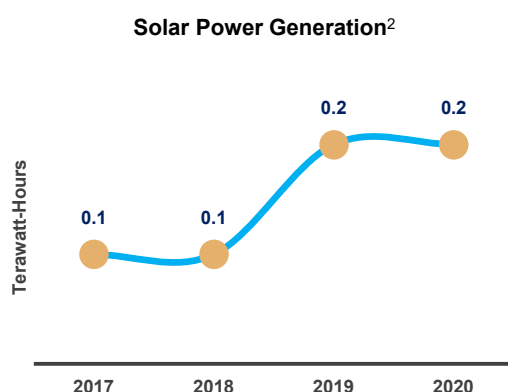
Source: ¹CSB, ²KEPA

3.2.4 Solar Energy

Generation of power by utilizing solar energy to generate power for homes and commercial centers.

OVERVIEW AND FACTORS INFLUENCING THE MARKET

- Kuwait is one of the largest consumers of power in the world and less than 1%¹ of total energy capacity of Kuwait comes from renewable energy.



encouraging individual households and commercial centers to adopt solar energy independently can speed the pace of its implementation in the country.

- During the 2021 United Nations Climate Change Conference, Kuwait has committed to³:
 - Reduce carbon emissions by 7.4% by the year 2035.
 - Reduce carbon emissions to its lowest point by 2050.
 - Give more importance to the utilization of renewable energy and liquid gas.
 - Increase the reutilization of emissions and other gasses (methane and carbon dioxide).
 - Increase the size of the natural conservatories to 15% of the total area of Kuwait.
 - Plant mangrove plants in the coastal areas and the northern islands to store carbon.
- While the government of Kuwait is taking several initiatives to produce clean energy, it still has a long way to go until a substantial amount of energy can be produced from sources that are carbon free. However, encouraging individual households and commercial centers to adopt solar energy independently can speed the pace of its implementation in the country.
- An initiative was undertaken in 2018 under the joint partnership of the Kuwait Foundation for the Advancement of Sciences, Kuwait Institute for Scientific Research and the Ministry of Electricity and Water, in addition to the Kuwait Municipality and the Public Authority for Housing Welfare to sign, construct, operate, and monitor rooftop grid-connected photovoltaic (PV) systems for a total of 150 Kuwaiti homes, at a rate of fifty homes per year over the course of three years.⁴
- While there is some resistance against the adoption of solar energy, there is a gradual shift in thinking towards a more sustainable way of generating and using power. Hence, a number of commercial centers and residential households in Kuwait are witnessing rooftop grid-connected photovoltaic (PV) systems being implemented.
- Kuwait is committed to the cause of climate change and is serious about reducing its carbon footprint by reducing carbon emissions.
- There is a small number of private players in the market currently catering to the needs of this niche segment with varied levels of success.

OPPORTUNITIES AND INVESTMENT CONSIDERATIONS

- As one of the sunniest countries in the world, Kuwait has abundant access to solar energy.
- Kuwait's fossil fuel reserves are depleting at a rapid pace. Hence, it is in the country's best interest to adopt an alternative source of energy that is sustainable and not fuel dependent.
- Kuwait has been facing an ever-increasing budget deficit year on year. A substantial part of Kuwait's budget is dedicated to providing subsidies on water and electricity. This may no longer be sustainable in the future and the government may start lifting subsidies to transfer costs directly to residents. The government is considering a reduction in subsidies by almost 55%, i.e., USD 7.24 Billion in the next 4 years from the current budgeted levels of USD 13.02 Bn.²
- The Kuwaiti market has a huge potential for solutions related to solar energy. The existing players in the market are limited both in term of numbers and in the type of technological solutions they provide. There is a wide scope of foreign investors with strong expertise to invest in this sector and reap good returns.

Source: ¹MEW, ²British Petroleum, ³KFAS, ⁴AIQabas

