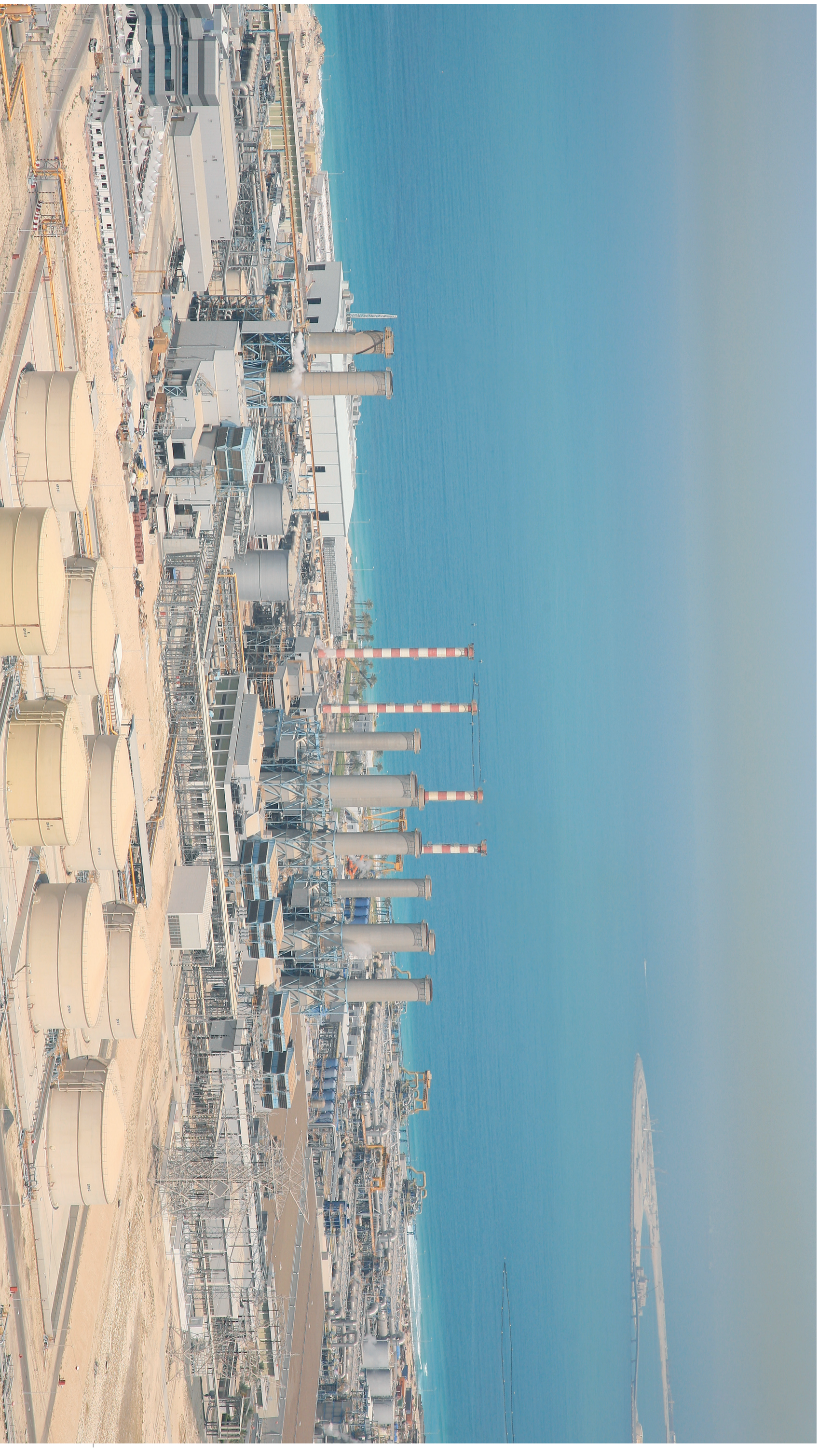


# ENVIRONMENTAL ATLAS OF ABU DHABI EMIRATE





## Photo Quiz

## What do we know about desalination?

### Discussion Points:

- > How does desalination work?
- > How does our water consumption compare?
- > How much energy does desalination use?
- > What is the environmental impact of desalination?
- > Is demand for desalination increasing?
- > Who uses the most water?

## Notes

> Humans cannot drink saline water. But, saline water can be made into freshwater, which everyone needs everyday. The process is called desalination, and it is being used more and more around the world to provide people with needed freshwater.

> Water that is saline contains significant amounts (referred to as "concentrations") of dissolved salts. In this case, the concentration is the amount of salt in water, as expressed in "parts per million" (ppm). If water has a concentration of 10,000 ppm of dissolved salts, then 1% of the weight of the water comes from dissolved salts. Fresh water has less than 1,000 ppm.

> The desalination process works by boiling seawater to create steam. Condensing the steam produces fresh water, with the remaining briny water being returned to the sea.

> The desalination process demands large amounts of energy and in Abu Dhabi, this process primarily uses natural gas. However, when combined with a power plant, total energy requirements are reduced by 30–50%.

> The environmental impacts of desalination are significant and not always obvious.

> Increased salinity, temperature and discharged chemicals used in the desalination process directly impact marine species, putting the fragile ecosystem of the Gulf under stress.

> Every day, nearly 22,000 kg of chlorine and 300 kg of copper are discharged into the Gulf.

> Concentrated chlorine constrains photosynthesis in plankton, which sits at the base of the marine food chain.

> Copper settles in marine sediment, is consumed by benthic organisms and is ultimately transferred into the food chain.

> Scientists now believe that elevated salinity levels are beginning to slow down the natural exchange of seawater between the Gulf and the Arabian Sea at the Strait of Hormuz. This process is essential to maintain the biodiversity and vitality of the Gulf's waters and is largely driven by the changing density of seawater, which generates a natural cycling of the waters.

## Did you know?

> The world's largest desalination plant is the Jebel Ali Desalination Plant (Phase 2) in the United Arab Emirates. It is capable of producing 300 million cubic metres of water per year.

> The rate of per capita domestic water consumption in Abu Dhabi averages 525-600 litres/day – double the rate of many developed economies – and is rising steadily.

> By far the largest portion of water consumption in Abu Dhabi, about 68%, involves agriculture and forest plantations.