

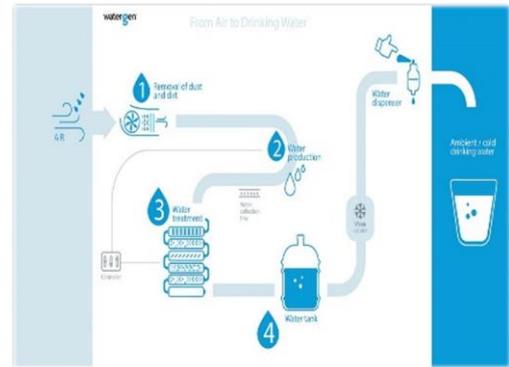


WATER MAKERS FOR SAFE, RELIABLE DRINKING WATER

TECHNOLOGY DESCRIPTION

TECHNICAL DESCRIPTION

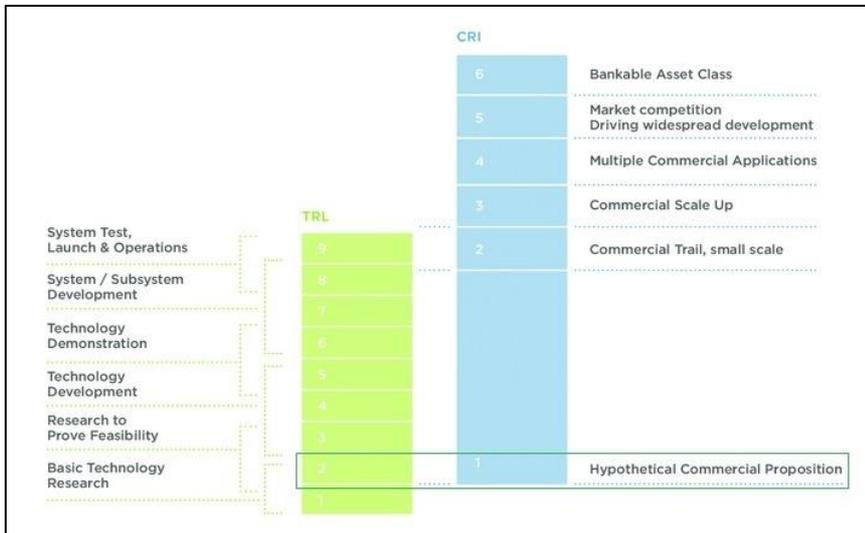
Atmospheric water generators (AWGs) produce potable water by extracting vapor from humid, ambient air – either by condensation or exposing the air to desiccants. In modern AWGs vapor from the air is drawn into the external roof-mounted unit and adsorbed into a specialized desiccant. Water is then desorbed and condensed into droplets. The liquid is piped into a tank where it receives up to three levels of treatment before the purified drinking water is dispensed at a tap or cooler. The more sustainable AWGs are solar powered and can even be fitted with network-connected water quality monitoring systems.^{1,2}



Source: Watergen USA

CURRENT COMMERCIAL READINESS INDEX

The **Commercial Readiness Index (CRI)** is a framework used to assess the *commercial maturity* of the technology under investigation using six (6) indicators (see figure). It complements and is often used in tandem with the **Technology Readiness Level (TRL)** method which measures the technology's *technical* maturity.



Atmospheric water generators are currently at **Level 1 hypothetical commercial proposition** – which indicates that they are commercially untested and unproven in the Antigua and Barbuda context. There is very little verifiable technical and financial data to support a plan for widescale deployment.

*CRI Level 1 indicates that water makers are in the Research phase of Technology Readiness.

¹ SOURCE Perfect water for every person, every place. Zero Mass Water, www.zeromasswater.com

² Genius Technology Energy efficient heat transfer and dehumidifying technologies. Watergen USA, <https://www.watergenusa.com/technology-2/technology/>



CLIMATE RATIONALE OF THE TECHNOLOGY

It is customary for residents across Antigua and Barbuda to utilize piped potable water for all household needs and purchase bottled water for consumption, i.e. drinking, cooking, preparing baby formula etc. In some cases, rainwater harvested in tanks may also be consumed, however there is a greater expressed confidence that bottled water is safer. Hence, in homes and businesses, bottled water is routinely purchased for use by residents, employees and patrons. This has created a nationwide dependence on locally produced and imported bottled water, and as a result the practice generates a significant volume of plastic waste (*a portion of which is recycled*). **Atmospheric water generators** will be introduced into the Antiguan and Barbudan market as a viable option to lessen dependence on bottled water and provide safe drinking water following disasters. They can be initially implemented on an individual or institutional basis, with commercial sized units being acquired for post-disaster use in the longer term. These larger systems may be retained by national entities – National Office of Disaster Services (NODS), the Water Utility or Barbuda Council – for rapid deployment after a severe climate event.

AMBITION OF THE TECHNOLOGY

SCALE FOR IMPLEMENTATION AND TIME-LINE

Atmospheric water generator units will be piloted in private and public buildings in the education and health sectors. A determined effort will be made to competitively select educational institutions, clinics, and offices across each of the six (6) parishes and Barbuda for the pilot project. Technology deployment will also involve an incentive programme to encourage retailers to purchase and stock units for sale, along with an education and training programme to upskill technicians to maintain the AWGs after they are commercially available. The timeline is sixty (60) months, with a budget of approximately USD 3 500 000 | XCD 9 408 700.

AMBITION FOR COMMERCIAL READINESS INDEX

The proposed goal for commercial readiness after the five (5) year period is to achieve **Level 2 commercial trial at a small/pilot scale**, this corresponds to the deployment phase of technology readiness. This represents installation of AWG cooler units with roof mounted solar panels in fifty (50) private offices, fifty (50) schools, twenty-five (25) clinics and doctors offices and twenty (20) government offices to replace existing water coolers or fountains for chilled drinking water.



EXPECTED IMPACTS OF THE TECHNOLOGY

Atmospheric Water Generators will provide an affordable, renewable source of clean, fresh drinking water that meets WHO³ standards and is approved for use in medical facilities. They will eliminate the need to refill, store and replace 5-gallon water bottles and in turn decrease Government expenditure on bottled water for public buildings, clinics and hospitals. After a successful pilot it can be expected that mobile water trailers will be procured for deployment following climate emergencies or extreme weather events. The field units will produce and dispense water in areas without grid electricity, thus supporting quicker on-streaming of essential services following disasters. In the longer term, there is potential for roof mounted units to be used collectively to create *water farms* that feed into the Utility's main. This technology will provide new opportunities for businesses and technicians, with a notable positive environmental effect of reducing reliance of plastic water bottles and the resulting plastic waste.

POLICY ACTIONS FOR TECHNOLOGY IMPLEMENTATION

EXISTING POLICIES IN RELATION TO THE TECHNOLOGY

The Public Health Act Cap 353 gives the Central Board of Health (CBH) legal powers to regulate all matters relating to public health – to include food and nutrition, water, and waste etc. It provides general regulations for public and private sector agencies involved in the production of water for human consumption; and the CBH has adopted as its standard the WHO guidelines for drinking water. In addition, the National Energy Policy speaks to increased adoption of renewable energy sources – including the use of solar photovoltaic panels for water production. This is aligned with the national climate change adaptation targets to offset water sector power demand with renewables. These lend their support to the introduction of **Atmospheric Water Generators** for residential and commercial use in Antigua and Barbuda and will further be employed to regulate quality of the end product.

PROPOSED POLICIES TO ENHANCE TECHNOLOGY IMPLEMENTATION

There is no need for new policies, plans or institutional arrangements to support the diffusion of **atmospheric water generators**. This is predominantly because the technology is completely new and untested on the Antiguan and Barbudan market. A market report produced at the end of the pilot phase will present scenarios for scaling up technology deployment and may outline policy gaps and propose what additional strategies are needed enhance widescale technology implementation.

³ World Health Organization



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USEFUL INFORMATION

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LINKS TO TNA REPORTS

<https://tech-action.unepdtu.org/country/antigua-and-barbuda/>