What is claimed is:

1. A water harvesting system for capturing water from surrounding air, comprising:

an adsorption/desorption unit, comprising:

a plurality of modules, configured such that at least one module operates in an adsorption mode concurrently as at least one of the remaining modules operates in a desorption mode,

wherein each module comprises at least one structural element,

wherein at least a portion of the at least one structural element supports at least one water capture material,

wherein the at least one water capture material adsorbs water from surrounding air when the module is in an adsorption mode, and desorbs water in the form of water vapor when the at least one module is in a desorption mode,

a mode-switching structure, configured to concurrently switch the at least one module from the adsorption mode to the desorption mode and the at least one of the remaining modules from the desorption mode to the adsorption mode;

at least one condenser, positioned in proximity to the at least one module in the desorption mode, and configured to condense the water vapor into liquid water; and

at least one air-circulating unit, configured to draw surrounding air into the at least one module in the adsorption mode, thereby assisting adsorption of the water by the at least one water capture material from the surrounding air.

2. The system of claim 1, wherein the mode-switching structure comprises a rotating mechanism, wherein the plurality of modules are connected to the rotating mechanism and arranged in a rotary configuration.

3. The system of claim 2, further comprising at least one steam-redirecting unit,

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configured to redirect the water vapor desorbed from the at least one module in desorption mode to the at least one condenser.

4. The system of claim 3, wherein each module further comprises a frame to hold together the at least one structural elements.

5. A water harvesting system for capturing water from surrounding air, comprising:

an adsorption/desorption unit, comprising:

at least one structural element,

wherein at least a portion of the at least one structural element supports at least one water capture material,

wherein the at least one water capture material adsorbs water from surrounding air when in an adsorption mode, and desorbs water in the form of water vapor when in a desorption mode:

at least one condenser, positioned in proximity to the at least one structural element, and configured to condense the water vapor into liquid water; and

at least one air-circulating unit, wherein the at least one air-circulating unit is configured to simultaneously (i) draw surrounding air into the at least one module operating in the adsorption mode, thereby assisting adsorption of water by the at least one water capture material in the at least one module operating is the adsorption mode from the surrounding air, and (ii) circulate air to cool the at least one condenser.

6. The system of claim 5, wherein the at least one structural element is a conductive element.

7. The system of claim 6, wherein the adsorption/desorption unit is configured to directly heat the at least one structural element and minimize waste heat

8. The system of claim 6, further comprising at least one heat exchange manifold

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connected to, or positioned around, the at least one structural element.

9. The system of any one of claims 1 and 5, wherein the at least one structural element is at least one plate.

10. The system of claim 9, wherein the at least one plates are arranged radially or parallel to each other within the module.

11. A water harvesting system for capturing water from surrounding air, comprising:

an adsorption/desorption unit, comprising:

a plurality of modules arranged in a rotary configuration,

wherein each of the plurality of module comprises at least one conductive element,

wherein at least a portion of the at least one conductive element is coated with at least one water capture material,

wherein the at least one water capture material adsorbs water from surrounding air when the module is in an adsorption mode, and desorbs water in the form of water vapor when the module is in a desorption mode;

a rotating mechanism, wherein the plurality of modules are mounted onto the rotating mechanism, and configured to concurrently switch at least one of the plurality of modules from the adsorption mode to the desorption mode and at least one of the plurality of modules from the desorption mode to the adsorption mode;

at least one condenser, positioned in proximity to the at least one module in desorption mode, and configured to condense the water vapor into liquid water; and

at least one air-circulating unit, configured to draw surrounding air into the at least one of the plurality of modules in the adsorption mode and circulate the air in the adsorption/desorption unit, thereby assisting adsorption of the water by the

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at least one water capture material from the surrounding air.

12. The system of claim 11, further comprising at least one steam-redirecting unit, configured to redirect the water vapor desorbed from the at least one of the plurality of modules in the desorption mode to the at least one condenser.

13. The system of claim 12, wherein the at least one condenser is positioned in the interior of the plurality of modules arranged in a rotary configuration.

14. The system of claim 13, wherein the at least one conductive element is at least one metal plate.

15. The system of claim 14, wherein the at least one metal plates are arranged radially or parallel.

16. The system of any one of claims 1, 5 or 11, wherein the at least one water capture material comprises metal organic framework.

17. The system of any one of claims 1, 5 or 11, wherein the at least one water capture material comprises desiccant material.

18. The system of any one of the preceding claims, further comprising a sealing structure, configured to seal one or more modules in desorption mode.

19. The system of any one of claims 1, 5 or 11, further comprising at least one collection unit, configured to receive the liquid water from the at least one condenser.

20. A method of harvesting water from surrounding air, comprising:

a) adsorbing water from surrounding air in at least one module in an adsorption mode;
b) desorbing at least a portion of water in at least one remaining module in a desorption mode;

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c) condensing at least a portion of the water vapor released from the at least one module in desorption mode using at least one condenser to produce liquid water,

wherein steps (a)-(c) occur concurrently; and

d) switching at least one module in the adsorption mode to the desorption mode and the at least one remaining module in the desorption mode to the adsorption mode.

21. A method of harvesting water from surrounding air, comprising:

e) drawing surrounding air into at least one module in an adsorption mode to assist adsorption of water by at least one water capture material and to assist cooling of at least one condenser, wherein the air is recirculated or recycled to assist with adsorption and cooling;

f) heating at least one remaining module~~s~~ in a desorption mode to assist desorption of at least a portion of the water from the at least one water capture material as water vapor; and

g) condensing at least a portion of the water vapor released from the at least one module in desorption mode using the at least one condenser to produce liquid water.

22. A method of harvesting water from surrounding air, comprising:

h) adsorbing water from surrounding air in at least one module in adsorption mode;

i) desorbing at least a portion of water in at least one remaining modules in a desorption mode as water vapor;

j) condensing at least a portion of the water vapor release from the at least one module in desorption mode using the at least one condenser to produce liquid w ater,

wherein steps (a)-(c) occur concurrently; and

k) rotating at least one module in the adsorption mode to the desorption mode and at least one of the remaining modules in the desorption mode to the adsorption mode.

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23. The method of any one of claims 20 to 22, wherein an air stream exits the at least one condenser, and the method further comprises recycling the air stream exiting the at least one condenser to the at least one module in desorption mode.

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