1. A thermal desalination system, comprising an evaporator having at least one group of effects having at least two effects, wherein each group consists of:

    (a) at least one vapor inlet;

    (b) at least one water inflow line, configured to be fed by a single feed water line;

    (c) at least one concentrate outflow line, configured to be drained into a common concentrate drainage line; and

    (d) at least one distillate outflow line.

    Wherein said groups are configured to be serially connected through their respective common concentrate drainage lines;

    wherein a main feed water line is configured to feed the at least one water inflow line of the first group in the series and the common concentrate drainage line of any preceding group is configured to feed the at least one water inflow line of its adjacent following group.

2. The system according to claim 1 wherein each effect consists of a first vapor and water outlet and a second vapor and water outlet.
3. The system according to claim 1 wherein an inlet chamber is configured to be disposed between two adjacent effects.
4. The system according to claim 3 wherein the inlet chamber is configured to receive vapor and water from the first vapor and water outlet of its adjacent preceding effect.
5. The system according to claim 3 wherein the inlet chamber is configured to receive vapor and water from the second vapor and water outlet of its adjacent preceding effect.

6. The system according to claim 4, wherein the inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the vapor inlet of its adjacent following effect.
7. The system according to claim 5, wherein the inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the vapor inlet of its adjacent following effect.
8. The system according to claim 1 wherein the main feed water line consists of at least one heater.
9. The system according to claim 8 wherein at least one inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the at least one heater.
10. The system according to claim 1 wherein the inlet chamber consists of a droplet separator.
11. The system according to claim 10 wherein the droplet separator is configured to establish a fluid communication with at least one of the first and second vapor and water outlets.
12. The system according to claim 11 wherein the number of heaters along the main feed water line is approximately equal to the number of effects in the evaporator.
13. The system according to claim 12 wherein each heater consists of a vapor inlet, a distillate outlet and a vapor outlet.
14. The system according to claim 13 wherein each inlet chamber in the series is configured to be in a fluid communication with a vapor inlet of a corresponding heater.

15. The system according to claim 1 wherein the common concentrate drainage line consists of a concentrate pump.
16. The system according to claim 15 wherein the concentrate pump is configured to pump concentrate from the common concentrate drainage line of an adjacent preceding effect into the water inflow line of an adjacent following effect.
17. The system according to claim 1 wherein the system is configured to receive a main vapor line into the vapor inlet of the first effect of the first group.
18. The system according to claim 1 wherein the at least one distillate outflow line of each group in the series is drained into a common main distillate line.
19. The system according to claim 1 wherein the last effect of the last group in the series is configured to be connected to a condenser.
20. The system according to claim 17 wherein the common main distillate line is configured to be connected to the condenser.
21. The system according to claim 20 wherein the condenser is configured to condense the vapors coming from the last effect of the last group in the series.
22. The system according to claim 13 wherein the vapor outlets of the heaters are drained into a common vapor outlet line.
23. The system according to claim 20 wherein the condenser is configured to condense the vapor of the common vapor outlet line.
24. The system according to claim 1 wherein the multi-effect evaporator consists of 20 effects.
25. The system according to claim 1 wherein the first group in the series is configured to be fed by the main feed water line and all other groups are configured to be fed by concentrate.

26. The system according to claim 1 wherein all effects in a group are configured to be fed by a parallel water inlet.

27. The system according to claim 1 wherein the at least one distillate outflow line of all groups and distillate outlets of all heaters are drained into a common main distillate line which is configured to be connected to the condenser.

What is claimed is:

1. A multi-effect evaporator adapted for distillation of water, comprising a plurality of effects serially connected and arranged into groups including a most upstream group and subsequent downstream groups;

each group having a most upstream effect and a most downstream effect and having a common parallel water feed inlet for supplying all effects in said group with feed water;

the evaporator further including a main feed water line in fluid communication with the common parallel water feed inlet of the most upstream group;

an array of heaters disposed along said main feed water line for heating said feed water before its entry into the common parallel water feed inlet of the most upstream group;

each effect comprising heat transfer means for receiving thereon feed water from said parallel water feed inlet, and therein an inlet vapor and to produce from the feed water a first outlet vapor, leaving the remainder of the feed water as a concentrate, and to condense a part of the inlet vapor to produce distilled water, leaving the remainder of the inlet vapor as a second outlet vapor;

each effect further comprising means for forwarding the first outlet vapor into an adjacent downstream effect, where it will constitute said inlet vapor, and means for forwarding said second outlet vapor into one of said heaters for heating thereby the feed water in said main water feed line;

each group further comprising a pump for extracting the concentrate from the effects of said group and pump it into the common parallel water feed of an adjacent downstream group; and means for collecting the distilled water,

wherein a vapor temperature decreases from the most upstream effect to the most downstream effect, and

wherein the feeding of the heated feed water to the most upstream group and the pumping of the concentrate, being the remainder of the feed water, to the adjacent downstream group, are selected to yield introduction of the most dilute feed water to the hottest effect, to minimize corrosion and scaling in the effects, wherein the heat transfer means in each effect comprises a plurality of tubes with inter-tube spaces therebetween, the tubes being horizontal or tilted at

an angle, receiving said inlet vapor, and contacting the feed water to cause heat transfer there resulting in the vaporization of a part of the feed water in the inter-tube spaces, to produce said first outlet vapor, leaving the remainder of the feed water as a concentrate, and resulting in the condensation of a part of the inlet vapor in the tubes, to produce said distilled water, leaving the remainder of the inlet vapor as said second outlet vapor, wherein the tubes in the hotter, more upstream effects contact a less concentrated feed water in respect to the tubes in colder, more downstream effects, the multi effect evaporator further comprising a plurality of dispersers, each arranged to introduce the inlet feed water to a corresponding effect as a vertical falling film.

2. The multi effect evaporator of claim 1, wherein the tubes are metallic.

3. The multi effect evaporator of claim 1, wherein the tubes are tilted at an angle from an horizontal state to yield a gravitational flow of condensed inlet vapor out of the tubes.

4. The multi effect evaporator of claim 1, wherein a number of effects in each group is selected to optimize overall evaporation.

5. The multi effect evaporator of claim 1, wherein a total number of effects in the evaporator is larger than 30.

6. The multi effect evaporator of claim 1, further comprising a removal line for Non Condensable Gases (NCG).

7. The multi effect evaporator of claim 1, further comprising a brine removal line for removing brine from the most downstream effect.

8. The evaporator according to claim 1, wherein said tubes deliver the condensed water and the second outlet vapor from one side of the effect to the other.

9. The evaporator according to claim 1, wherein the number of effects comprised in one group varies.

10. The evaporator according to claim 1, wherein each group further comprises a

concentrate drainage line in fluid communication with said pump.

11. A multi-effect evaporator adapted for distillation of water, comprising a plurality of effects serially connected and arranged into groups including a most upstream group and subsequent downstream groups;

each group having a most upstream effect and a most downstream effect and having a common parallel water feed inlet for supplying all effects in said group with feed water;

the evaporator further including a main feed water line in fluid communication with the common parallel water feed inlet of the most upstream group;

an array of heaters disposed alone said in feed water line for heating said feed water before its entry into the common parallel water feed inlet of the most upstream group;

each effect comprising heat transfer means for receiving thereon feed water from said parallel water feed inlet, and therein an inlet vapor and to produce from the feed water a first outlet vapor, leaving the remainder of the feed water as a concentrate, and to condense a part of the inlet vapor to produce distilled water, leaving the remainder of the inlet vapor as a second outlet vapor;

each effect further comprising means for forwarding the first outlet vapor into an adjacent downstream effect, where it will constitute said inlet vapor, and means for forwarding said second outlet vapor into one of said heaters for heating thereby the feed water in said main water feed line;

each group further comprising a pump for extracting the concentrate from the effects of said group and pump it into the common parallel water feed of an adjacent downstream group and means for collecting the distilled water,

wherein a vapor temperature decreases from the most upstream effect to the most downstream effect, and

wherein the feeding of the heated feed water to the most upstream group and the pumping of the concentrate, being the remainder of the feed water, to the adjacent downstream group, are selected to yield introduction of the most dilute feed water to the hottest effect, to minimize corrosion and scaling in the effects,

wherein the heat transfer means in each effect comprises a plurality of tubes with inter-tube spaces therebetween, the tubes being horizontal or tilted at an angle, receiving said inlet vapor, and contacting the feed water to cause heat transfer therebetween, resulting in the vaporization of a part of the feed water in the inter-tube spaces, to produce said first outlet vapor, leaving the remainder of the feed water as a concentrate, and resulting in the condensation of a part of the inlet vapor in the tubes, to produce said distilled water, leaving the remainder of the inlet vapor as said second outlet vapor, wherein the tubes in the hotter, more upstream effects contact a less concentrated teed water in respect to the tubes in colder, more downstream effects, wherein each effect has an upstream end and a downstream end, and the tubes are tilted so as to cause said distilled water within the tubes to flow down to the downstream end of said effect by force of gravity.

12. The evaporator according to claim 11, wherein the parallel water feed inlet in each group of the effects comprises dispersion means for introducing said feed water into each of said effects of the group so as to allow its contact with the tubes.

13. The evaporator according to claim 11, wherein the dispersion means is arranged to introduce the feed water in a thin film form.

14. A distillation method comprising:

evaporating, in a multi effect evaporator comprising a plurality of serially connected effects arranged into groups including a most upstream group and subsequent downstream groups, outlet vapor from inlet feed water by condensing introduced inlet vapor, to leave outlet concentrate behind, and introducing for each but a most downstream effect, the outlet vapor as inlet vapor into an adjacent downstream effect, to yield a decrease of an inlet vapor temperature from a most upstream effect to the most downstream effect;

introducing inlet feed water to the effects groupwise, wherein for each but a most downstream group, the outlet concentrate is introduced as inlet feed water into the effects of an adjacent downstream group; and

introducing heated feed water as inlet feed water into the effects of the most upstream group, to yield introduction of a most dilute inlet feed water to effects of the most upstream hottest

group, that receives the hottest inlet vapor, to minimize overall corrosion and scaling in the evaporator,

receiving the inlet vapor in a plurality of tubes with inter-tube spaces therebetween, vaporisating a part of the feed water in the inter-tube spaces, producing a first outlet vapor, leaving the remainder of the feed water as a concentrate, to produce distilled water, leaving the remainder of the inlet vapor as a second outlet vapor and

introducing the inlet feed water as a vertical falling film.

15. The distillation method of claim 14, further comprising selecting a number of effects in each group to optimize overall evaporation.