

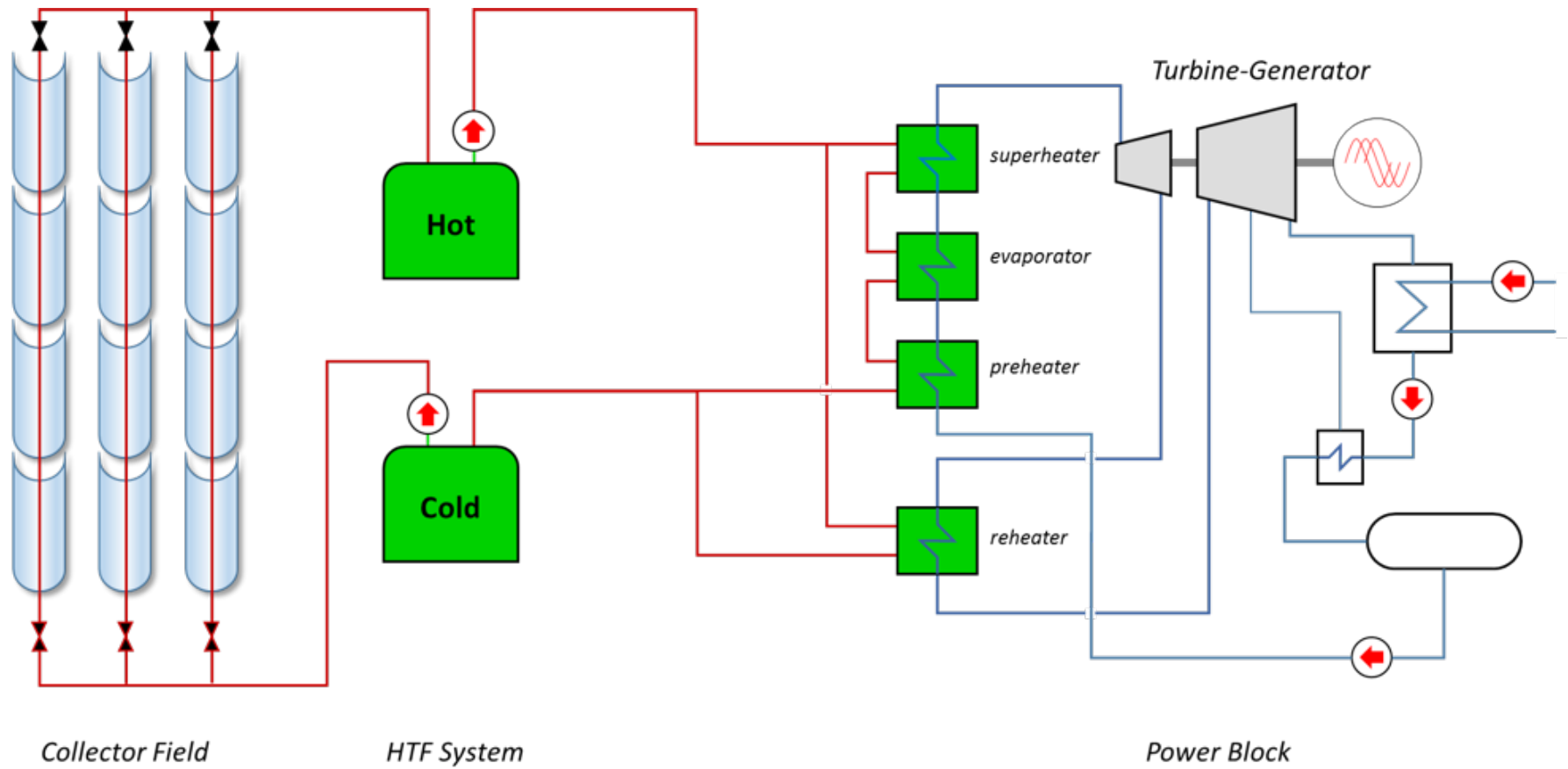
Process Flow Diagrams

CONCENTRATED SOLAR POWER

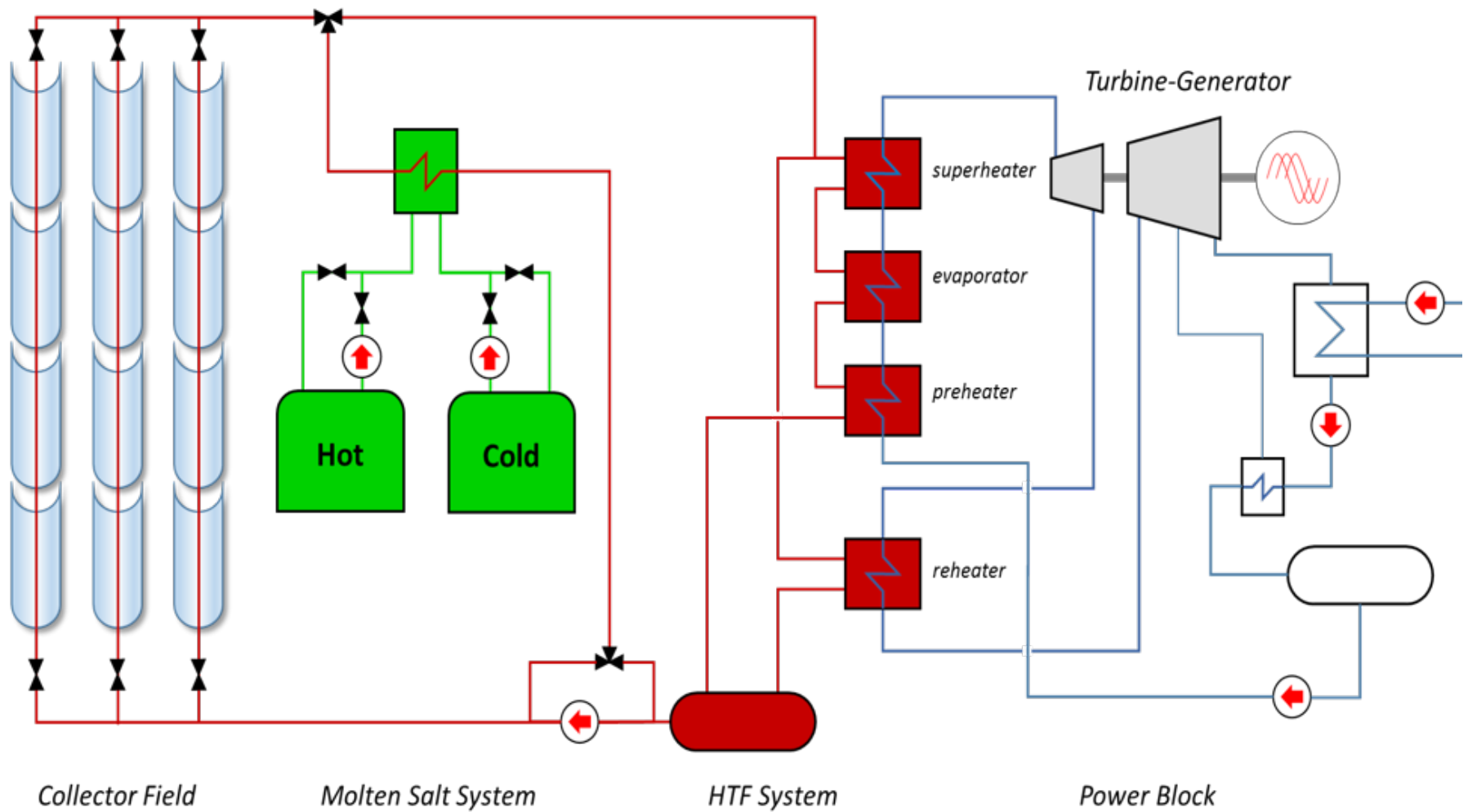


Experience In Motion

A CLOSER LOOK AT CONCENTRATED SOLAR POWER TECHNOLOGY

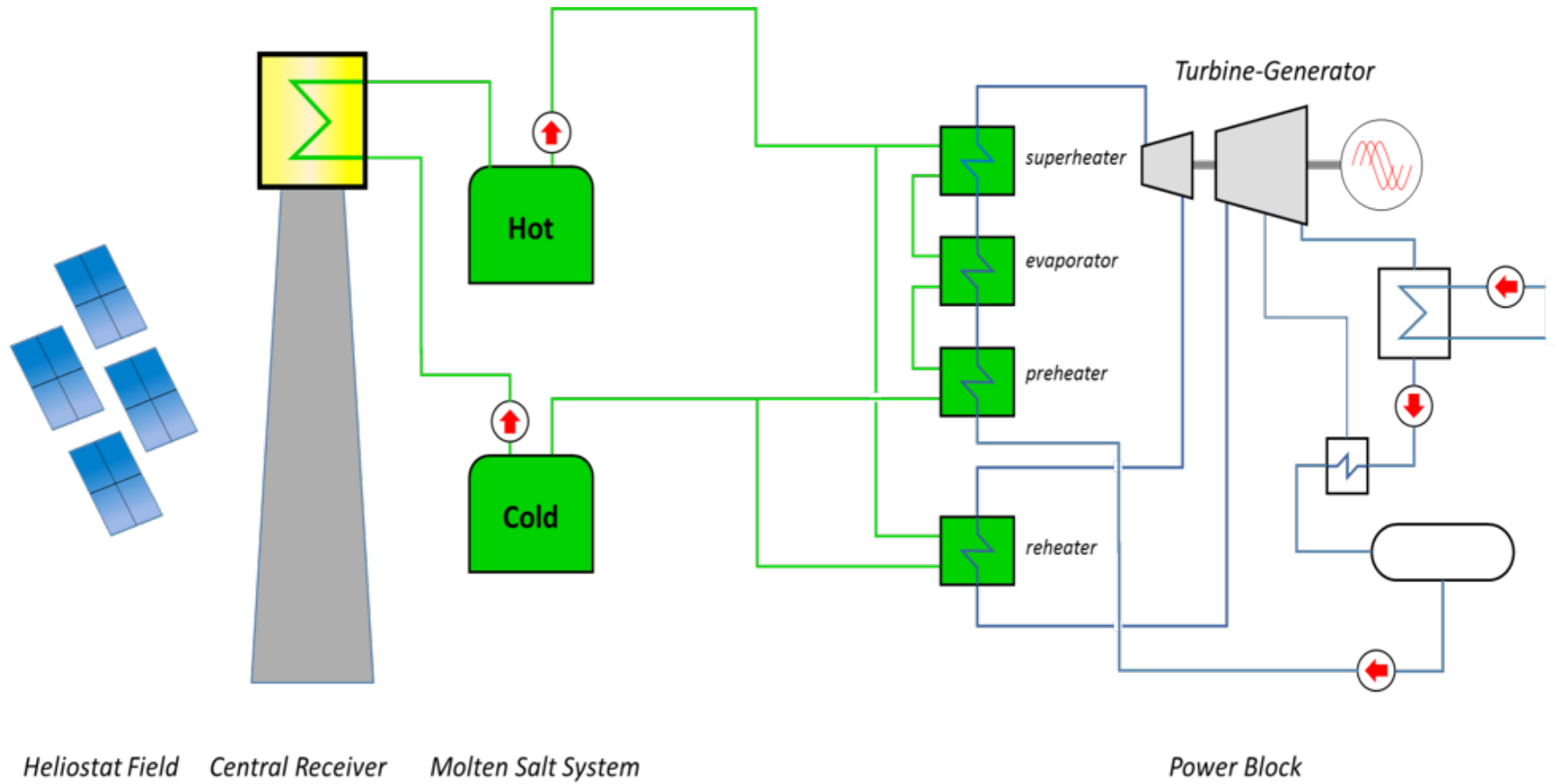


Parabolic trough with molten salt as the HTF

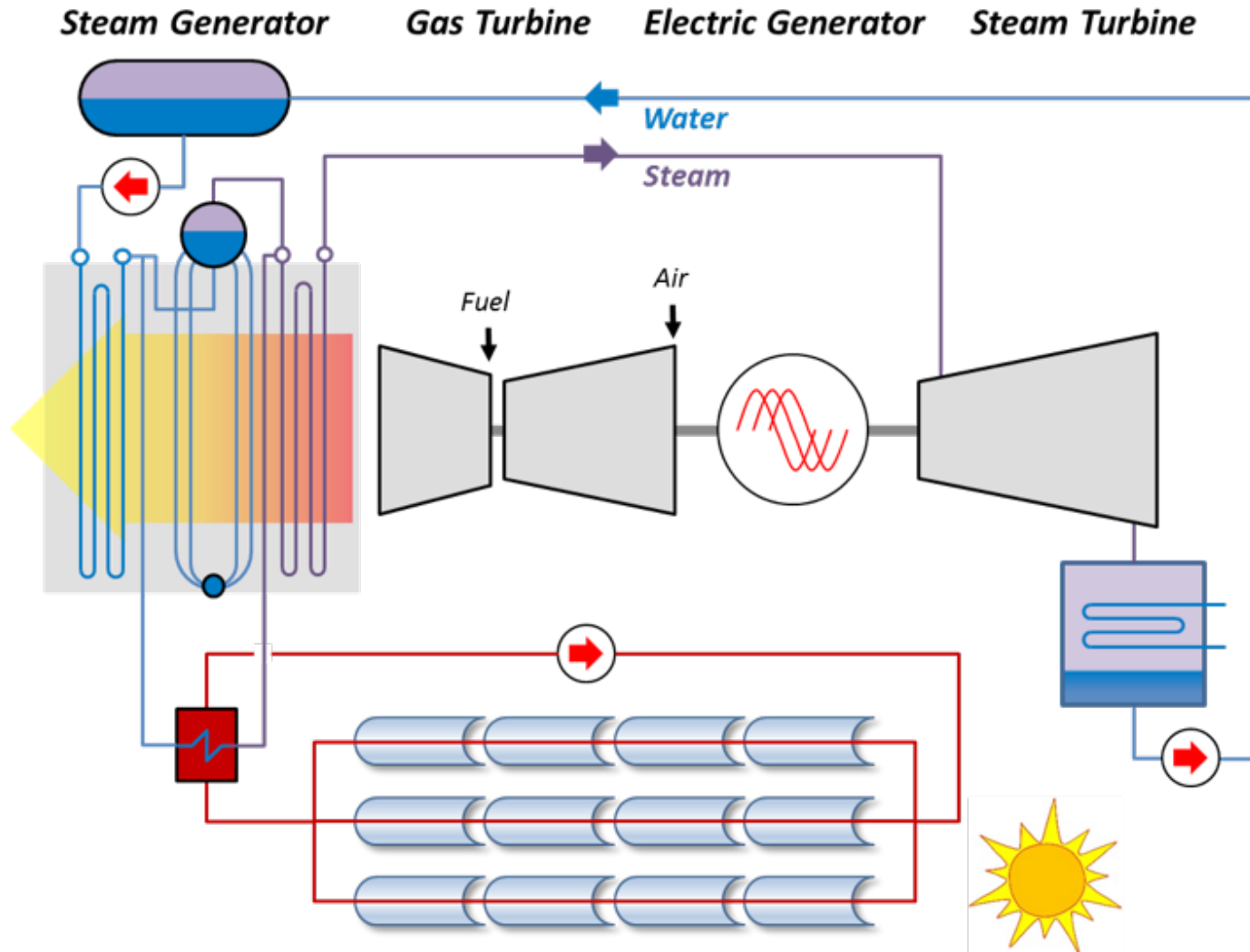


Parabolic trough with thermal oil as HTF and molten salt TES

A CLOSER LOOK AT CONCENTRATED SOLAR POWER TECHNOLOGY



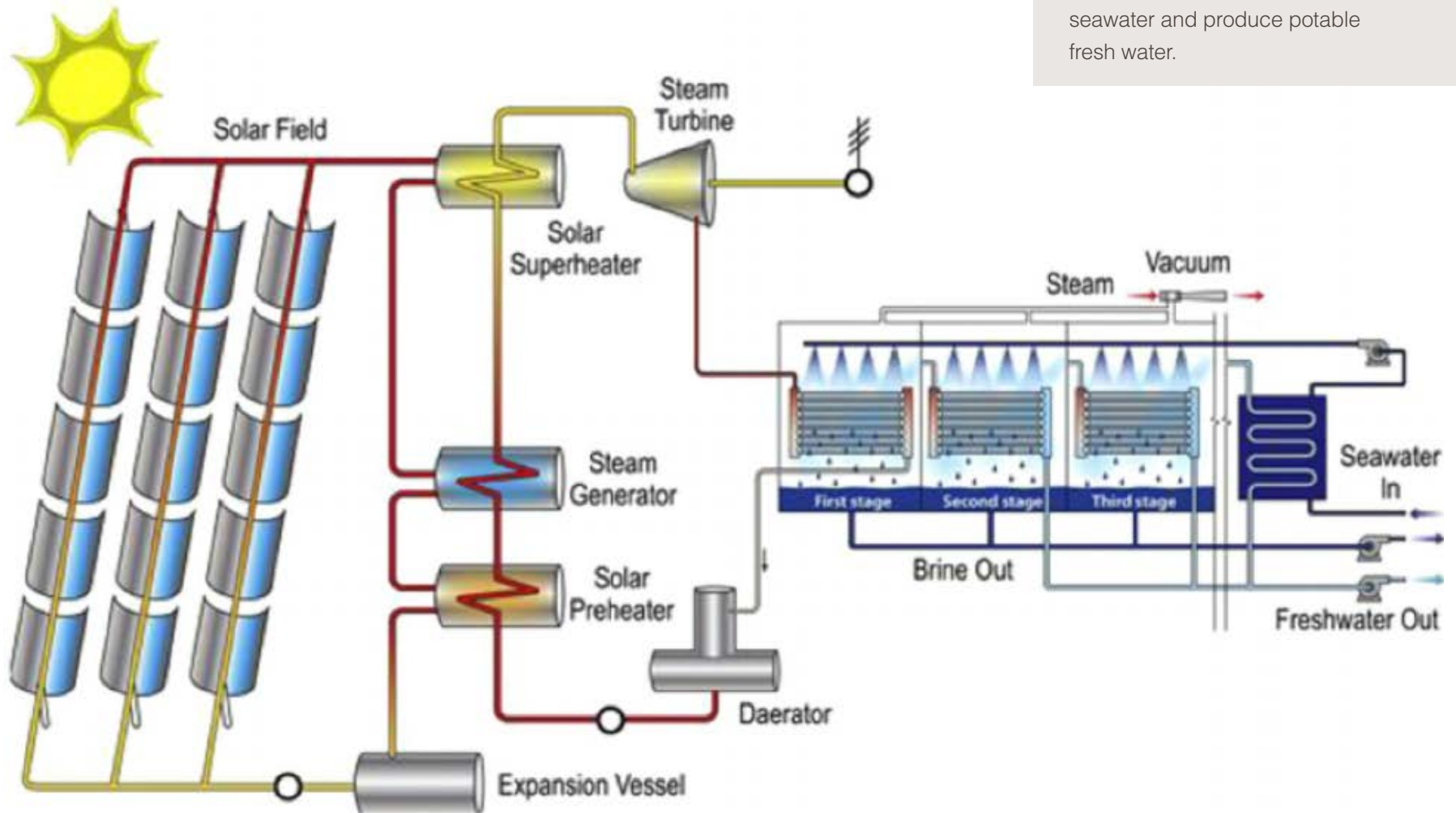
Tower with molten salt as HTF and TES



Simplified integrated solar combined cycle plant

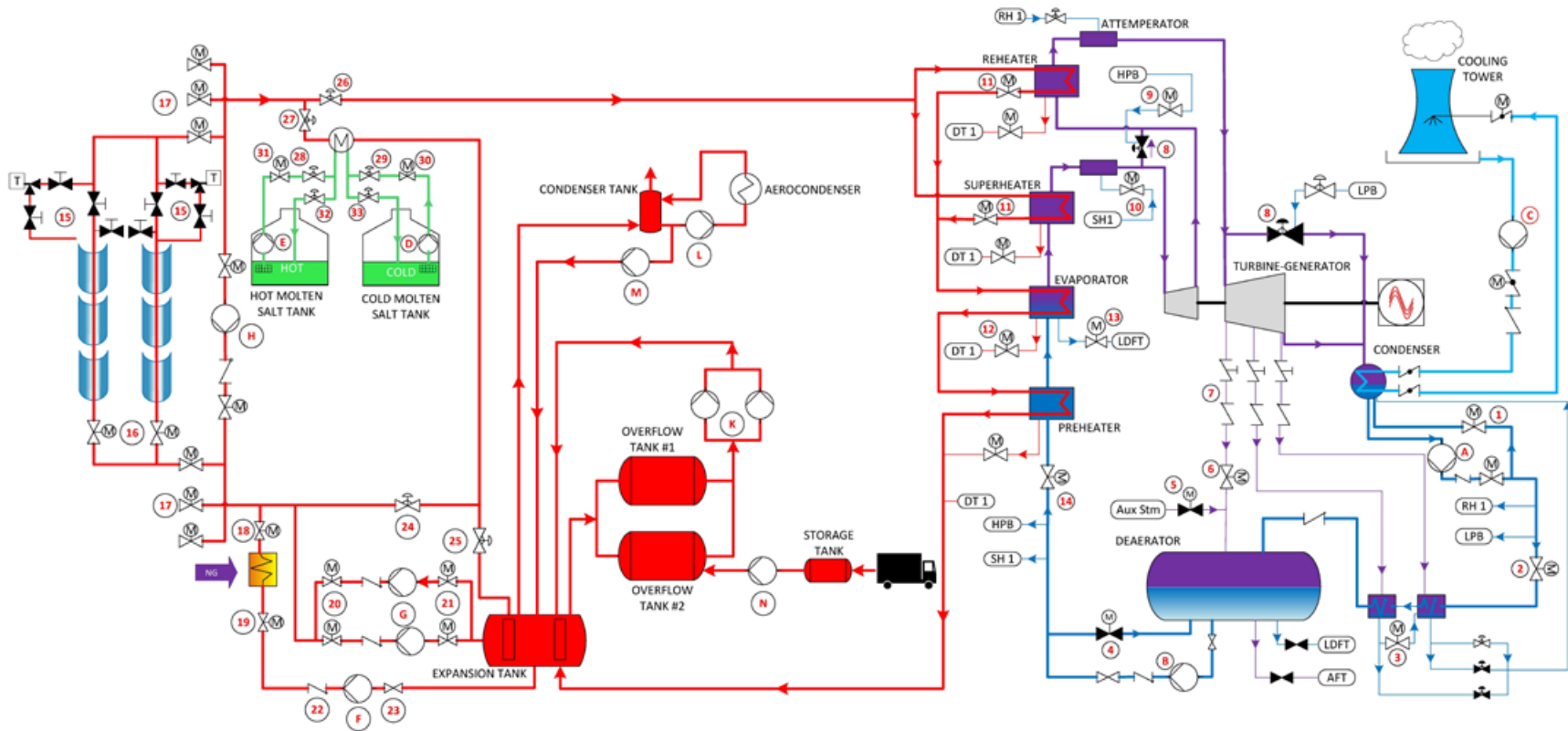
A CLOSER LOOK AT CONCENTRATED SOLAR POWER TECHNOLOGY

Rather than utilize fossil energy, the sun's radiation is used to distill seawater and produce potable fresh water.



CSP integrated with MED desalination plant

PARABOLIC TROUGH PROCESS FLOW DIAGRAM



PARABOLIC TROUGH - Pumps

	<u>FLS Product</u>	<u>API</u>
A. Condensate Extraction	APKC / VPC	VS6
B. Main Feedwater	WXH	BB4
C. Condenser Cooling	VTP / VCT	VS1
D. Cold Molten Salt	VTP	VS1
E. Hot Molten Salt	VTP	VS1
F. Main HTF Pumps	HDX	BB2
G. Freeze Protection Pumps	HPX	OH2
H. Solar Field Recirculation Pump	HPX	OH2
K. Overflow Pumps		
L. Ullage Circulation Pump		
M. Ullage Discharge Pump		
N. HTF Filling Pump		

PARABOLIC TROUGH - Valves

	<u>FLS Product</u>
1. Condensate Pump Minimum Flow	CavControl / Diamondback
2. Deaerator Level Control	CavControl / Diamondback
3. LP Heater Drain Control	Mark One / Mark 100
4. Feed Pump Minimum Flow	ChannelStream / Diamondback
5. Aux Pegging Steam	MegaStream
6. Pegging Steam	MegaStream
7. Stop-Check/Non-Return Steam Extraction	Univalve / FliteFlow
8. HP and LP Turbine Bypass	
9. Turbine Bypass Spray Water	Diamondback / Sidewinder
10. Attemperator Spray Water	Diamondback / Sidewinder
11. Reheater/Superheater Thermal Oil Temperature Control	Diamondback / Sidewinder
12. Pre-Heater/Evaporator/Superheater/Reheater Thermal Oil Salt Drain	Univalve
13. Evaporator Continuous Blowdown	Continuous Blowdown
14. Evaporator Level Control	Mark One / Mark 100
15. Isolation and Vent Valves	FlowPro
16. Heat Transfer Fluid Flow Control	FlowPro
17. Solar Field Module Flow Control	CavControl / TMCBV
18. Thermal Oil NG Heater Outlet Isolation	TX3
19. Thermal Oil NG Heater Inlet Isolation	TX3
20. Freeze Protection Pump Outlet Isolation	TX3
21. Freeze Protection Pump Inlet Isolation	TX3
22. Thermal Oil Main Pump Flow Anti-return	Univalve / FliteFlow
23. Thermal Oil Main Pump Inlet Isolation	TX3
24. Inlet Thermal Oil Flow Control from TES Exchanger	Mark One
25. Thermal Oil Expansion Tank Inlet Main Flow Control	Mark One
26. Thermal Oil Solar Field Outlet Main Flow Control to Steam Generators Train	Mark One
27. Outlet Thermal Oil Flow Control from TES Exchanger	Mark One
28. Hot Molten Salt Tank Main Flow Control	Mark One
29. Cold Molten Salt Tank Main Flow Control	Mark One
30. Cold Molten Salt Tank Main Flow Isolation	TX3
31. Hot Molten Salt Tank Main Flow Isolation	TX3
32. Hot Molten Salt Tank Main Flow Recirculation	CavControl
33. Cold Molten Salt Tank Main Flow Recirculation	CavControl

SOLAR TOWER

- A. Condensate Extraction
- B. Main Feedwater
- C. Condenser Cooling
- D. Cold Molten Salt
- E. Hot Molten Salt
- F. Attemperator
- G. Drain Tank

1. Condensate Pump Minimum Flow
2. Deaerator Level Control
3. LP Heater Drain Control
4. Feed Pump Minimum Flow
5. Aux Pegging Steam
6. Pegging Steam
7. Stop-Check/Non-Return Steam Extraction
8. HP and LP Turbine Bypass
9. Turbine Bypass Spray Water
10. Attemperator Spray Water
11. Reheater/Superheater Molten Salt Temperature Control
12. Pre-Heater/Evaporator/Superheater/Reheater Molten Salt Drain
13. Evaporator Continuous Blowdown
14. Evaporator Level Control
15. Solar Receiver Level Control
16. Cold Molten Salt Pump Minimum Flow
17. Attemperator Pump Minimum Flow
18. Reheater/Superheater Molten Salt Temperature Control
19. Hot Molten Salt Pump Minimum Flow
20. Solar Receiver Inlet Vessel Air Pressure Control
21. Solar Receiver Vent
22. Solar Receiver Drain



North America

Latin America

Europe

Middle East

Africa

Asia-Pacific

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