

# Report from the WGs

## SURFACE EQUIPMENTS

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- Power conversion
- Chp
- Zero emission
- Grid flexibility
- Hybrid (other source)

# A1 – Developing the next generation of deep geothermal electricity and heating/cooling technologies

Surface, Power Plant, Generation & Operation	40	High temperature binary power plants.
	41	Zero emission power plants.
	42	Corrosion and scaling resistant materials for surface installations (valves, pipes, turbines...)
	43	Development of power cycles and mitigation for super high enthalpy resources.
	44	Coupled analysis and optimization based on reservoir, wellbore, steam system and power plant models for high temperature reservoirs.
	45	focus on specific components on binary cycle: design of improved heat exchanger, selection of material, surface structure and coating to enhance heat transfer and minimize scaling, increase efficiency of cooling system by enhancement of air-cooler/condenser and matching to cycle
	46	Advanced numerical modelling in geochemistry for approaches for corrosion and scaling prevention
	47	Maximizing energy conversion and uses (binary systems, heat pumps, ORC, new cycles...),
	48	Improving coupling of geothermal energy with renewable sources for hybrid plants
	49	Energy storage from geothermal production (thermal or electric)
	50	Abatement technologies for NCG (Non Condensable Gas) Innovative process for NCG (CO <sub>2</sub> /H <sub>2</sub> S) reinjection
	51	Seasonal underground thermal energy storage to enhance performance of geothermal systems

## A2 – Close-to-market demonstration of competitive deep geothermal electricity and heating/cooling

Surface, Power Plant, Generation & Operation	68	test next generation of working fluids for binary cycle technology
	69	Development of system for power modulation and smart management of the grids and storage by using binary cycle technology
	70	Focus on specific components on binary cycle
	71	Thermodynamic cycle optimization and increase in cycle efficiency (multi level, multi fluid, supercritical, optimized extraction of the heat for combined heat and power)
	72	Air condensers – the most common used type of cooling in geothermal ORC's - are the largest and single-item most expensive components in a geothermal ORC plant;
	73	develop of CO2 re-injection or sequestering-capturing in high CO2 content/systems
	74	Power Plant, Generation & Operation - Improving conversion yield of primary thermal resource
	75	Dissolved gas turbinen in order to produce electricity in addition to geothermal heat, without releasing GES in the atmosphere
	76	Bottoming of existing flash plants with binary cycle technology
	77	Coupling the geothermal heat sources with other renewable energy sources to increase the power output of binary cycles and new geothermal combined heat and power plants and optimization of new and existing DHC networks
	78	Metal extraction techniques
	79	Hybrid cooling of binary cycles working with low temperature geothermal source
	80	Strategies for the design and predictive maintenance of heat exchangers used in geothermal applications
	81	ORC suitable for variable heat and electricity supply