Realizing the geothermal electricity potential - water use and consequences

Supplementary Material:
Additional Results

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Figure S1: Water requirements of geothermal electricity from hydrothermal resources with well-head temperature less than 200 °C. An ORC cycle with IHE and WRCS is assumed.

Figure S2: Water requirements of geothermal electricity from hydrothermal and EGS resources with well-head temperature greater than 175 °C. A single flash power plant with WRCS is assumed.
Figure S3: Water requirements of geothermal electricity from low to medium enthalpy (<200 °C) EGS resources. The figure compares the degraded water and geothermal fluid withdrawal requirements of a wet cooled ORC plant (with IHE) with that of a dry cooled one. Freshwater requirements of a wet cooled plant is not shown and summarized in Figure 1 in the main article. No freshwater us required by dry cooled ORC plants.

Figure S3: Comparison of water withdrawal intensities electricity from various sources.
### Table S1: Uncertainty in estimates of water requirements of thermoelectricity. Based on Mielke 2010

|                    | Average | Minimum | Maximum |
|--------------------|---------|---------|---------|
| Coal               | 2.04    | 1.68    | 2.37    |
| Coal with CCS      | 3.07    | 2.04    | 3.88    |
| NGCC               | 0.86    | 0.78    | 0.90    |
| Nuclear            | 3.19    | 1.72    | 5.31    |

Figure S4: Impact of displacement of thermoelectricity by EGS electricity on water withdrawal requirements. “D” represents the percentage of thermoelectricity produced in reference scenario (RS) and displaced by electricity from EGS resources in Geothermal Scenario (GS). Two geothermal sub-scenarios are envisaged – the baseline (GS-BL) and water efficient (GS-WE) scenarios.