MATCHING
Executive Summary

1. **Project description:** The goal of MATChING is the reduction of cooling water demand in the energy sector through innovative technological solutions, to be demonstrated in thermal and geothermal power plants. The project targets include an overall saving of water withdrawal of 30% in thermal power generation, and a decrease of evaporative losses up to 15-20% in geothermal sector. The use of **advanced and nano-technology based materials** will be leveraged to make economically affordable water saving in power plants and pave the way to the market uptake. All technological areas of plant cooling systems will be affected: cooling tower, steam condenser, cooling water circuit and water conditioning. The use of alternative cooling fluids will be investigated to develop advanced hybrid cooling towers for geothermal high temperature power plants, and hybrid cooled ORC for low temperature geothermal source, combining dry/wet cooling, and closed loop groundwater cooling. To improve cooling equipment robustness advanced materials and coatings for cooling tower and condensers will be investigated, allowing increasing concentration cycles or directly using aggressive fluids. Demonstration will take place in partner-owned industrial sites, operating pilot plants in intended environment and/or in full scale, guaranteeing the achievement of TRL 6 for all the technologies. The demonstration activities and the partnership composition ensures the validation of suitable business models and the finalization of business plans, guaranteeing the technological transfer from industry to market, increasing competitiveness at European level, and impacting on water use in power generation sector.

It will be party founded by H2020 program (total cost 11,9 M€, grant 9,7 M€)
NMP 15 – 2015: Materials innovations for the optimization of cooling in power plants.

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2. **Asset description:** The HT geothermal test site for the MATCHING project will be the cooling tower of the Nuova San Martino (Larderello); to allow the application of hybrid towers in geothermal field, advanced tower filling (e.g. splash 3D packing), able to reduce the volume of packing but not the thermal efficiency, will be installed in the wet section. The dry section, similarly, will be strengthened by means of advanced coatings (e.g. nano-coatings). These coatings will be applied on the internal and external surfaces increasing the robustness of dry section and avoiding fouling and clogging phenomena without reducing the thermal exchange efficiency between geo-fluid and air. The results coming from this demonstration can be extended to thermal power plants using lower quality waters. and higher cycles of concentration.

3. **Entities Involved**: ENEL Ingegneria e Ricerca SpAis the project coordinator, with the following partners:
   - LABORELEC LABORELEC Belgium R&D.
   - Endesa Generación SA ENDESA Spain Utility
   - ENEL Green Power SpA EGP Italy Utility
   - Vlaamse Instelling voor Technologisch Onderzoek N.V. VITO Belgium R&D
   - KEMA Nederland bv DNV GL The Netherlands Industry
   - Consiglio Nazionale delle Ricerche –Istituto per la Tecnologia delle Membrane CNR-ITM Italy R&D
   - EDF Recherche & Développement EDF France Utility
   - Pathema BV PATHEMA The Netherlands Vendor
   - Asociación de Investigación Metalúrgica del Noroeste AIMEN Spain R&D
   - SPIG SpA SPIG Italy Vendor
   - Danish Technological Institute DTI Denmark R&D
   - Aquastill BV

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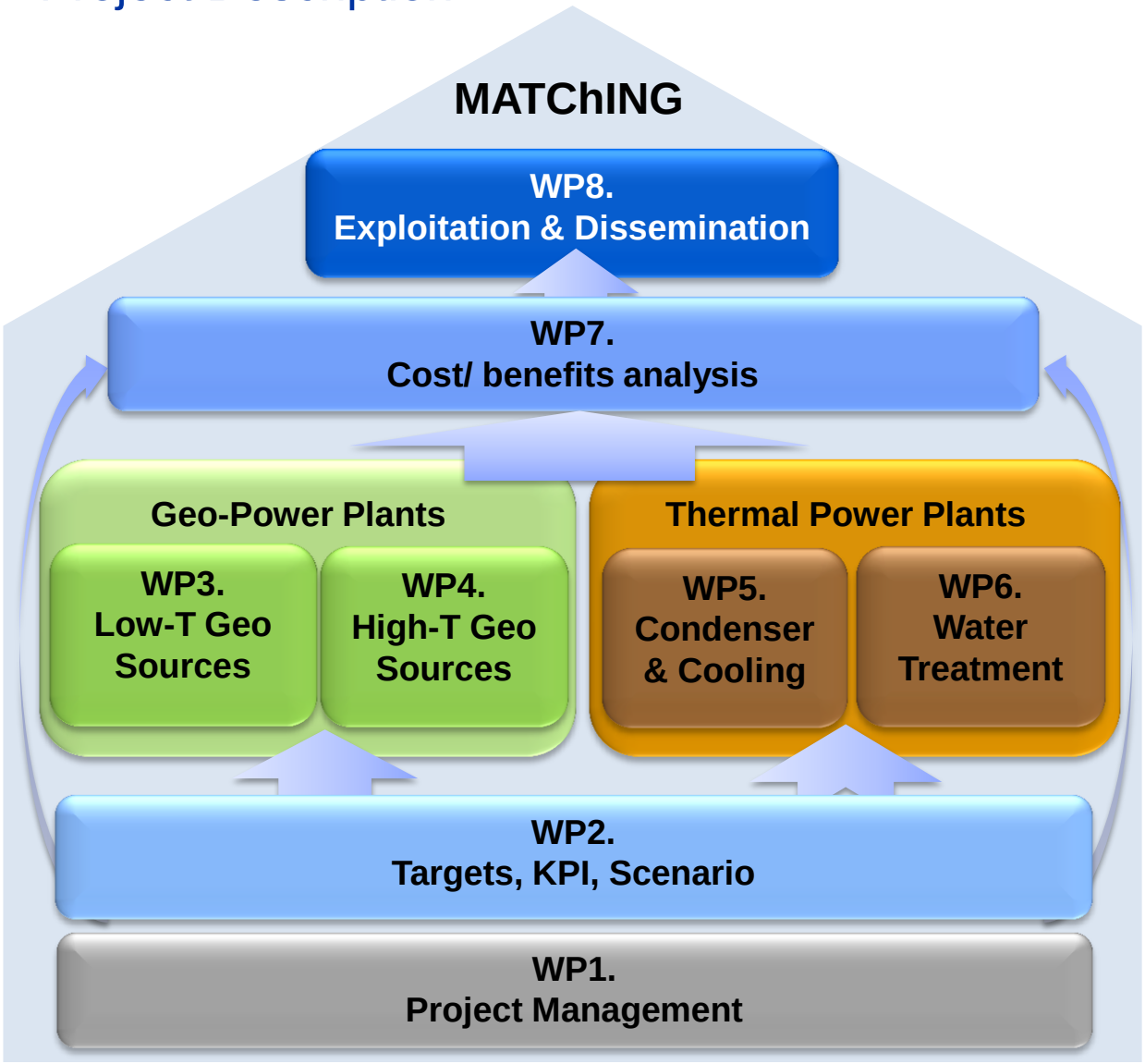
Project Description



Enel Green Power will be involved as Work Package leader in WP4, and will be active also in all tho other WP's

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