

# The EU Project: MATChING

## Materials & technologies for performance improvement of cooling systems in power plants

October 2 , 2018

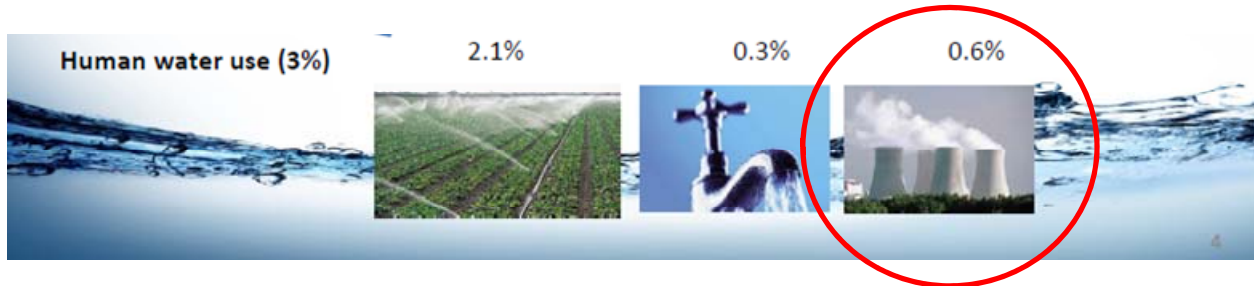
***MATCHING WORKSHOP***

***Rome, Italy***

Daniela Galla, Enel

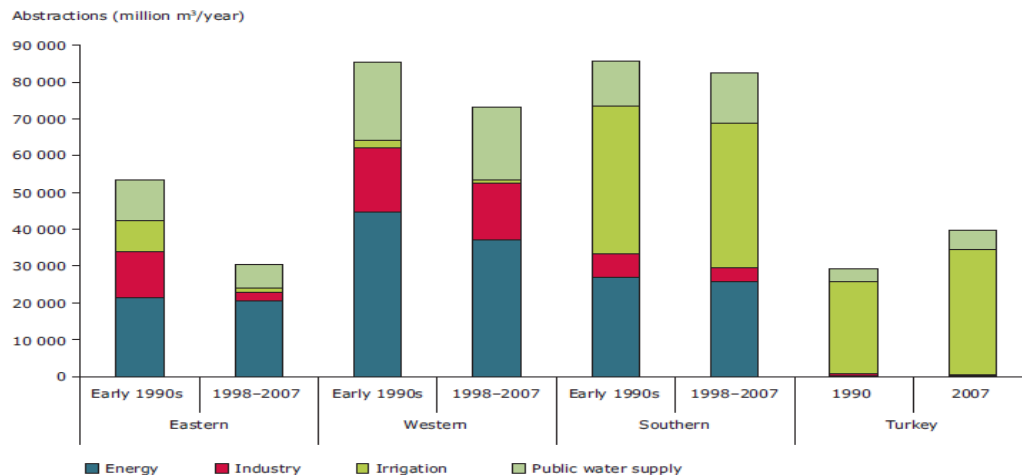


# Background and Rational



Starting Date	First of March 2016
Duration:	42 months
Partners:	16
Overall Budget	€ 11.847.291,75
Grant Amount	€ 9.706.413,77

## EU Water abstraction per sector – EEA 90's vs 2007



Power generation is a sector requiring great amounts of water: Cooling water for energy production accounts in fact, for 43-45% of total water abstraction in European Union

**MATCHING\*** is a collaborative project, funded by EU H2020 program. The project aims to reduce the water demand and to improve the energy efficiency of cooling systems in the power generation sector

## The Consortium

Consortium is made of 4 **Utilities**, 5 **Technology Providers**, 6 **Research institute** and 1 **Service provider**.

*Partners are from 6 EU Counties: 4 from Italy, 4 from Belgium, 3 from Spain, 3 from Netherland, 1 from France and 1 from Denmark*

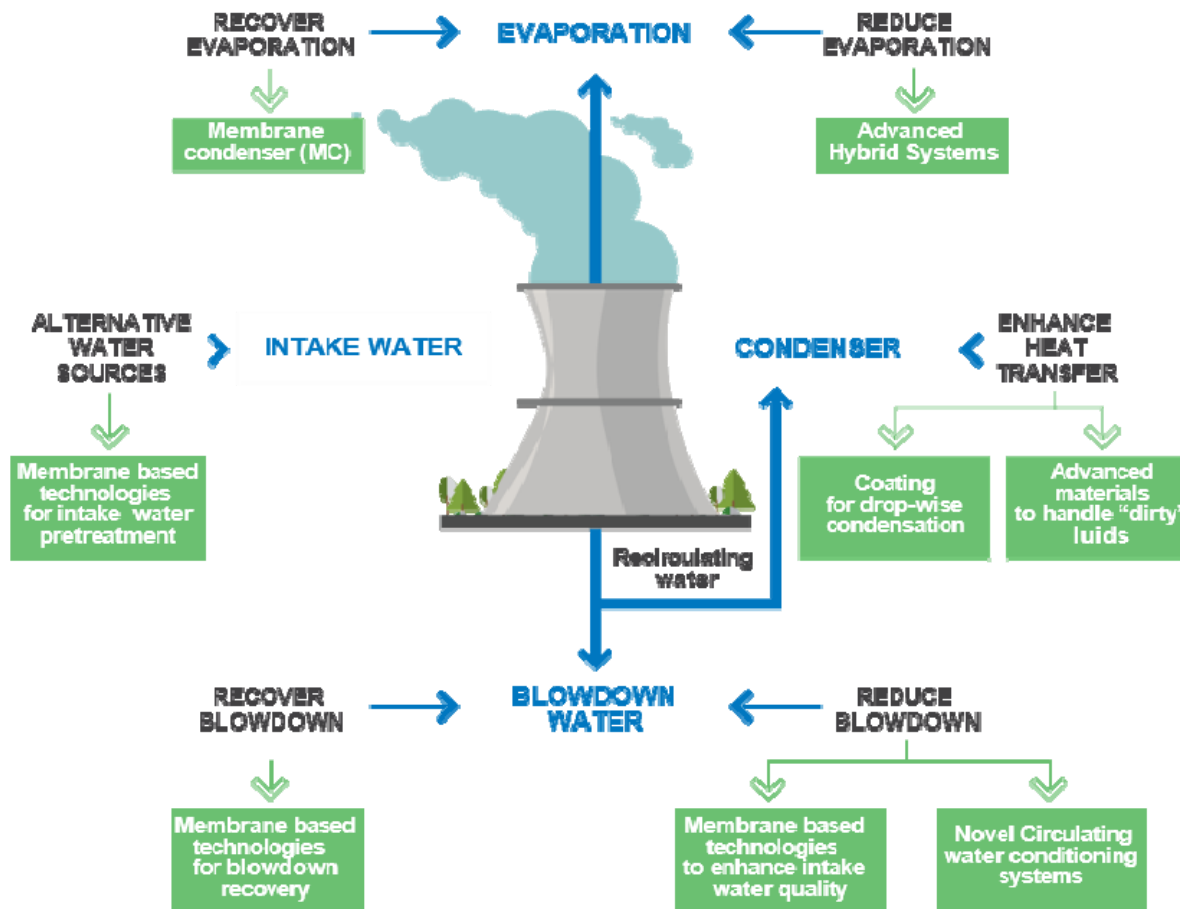


**MATCHING**

MATERIALS & TECHNOLOGIES FOR  
PERFORMANCE IMPROVEMENT OF  
COOLING SYSTEMS IN POWER  
PLANTS



# MATChING approach and methodology



## Expected Outcomes



Overall reduction of geothermal steam emitted into the atmosphere **up to 15%** and extension of production wells life up to 10% using hybrid solutions for cooling towers and advanced materials and coatings for dry modules



Overall plant efficiency increase up to 0.4-0.5%, enhancing the heat transfer efficiency in the condenser both on the steam side and water side via the use of advanced nano-engineered coatings and surfaces.



Overall reduction of fresh water use in fossil fuelled power plants of about 30% validating a set of solutions for the recovery and treatment of waters coming from cooling tower blowdown, FGD, municipal water.

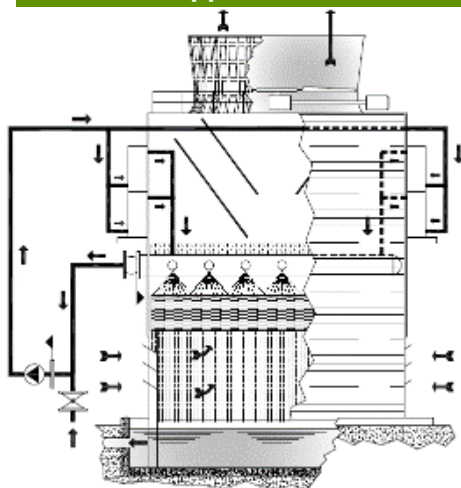


# Technologies

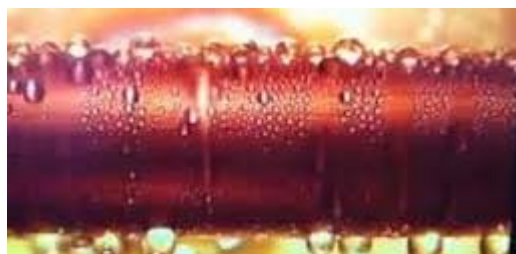


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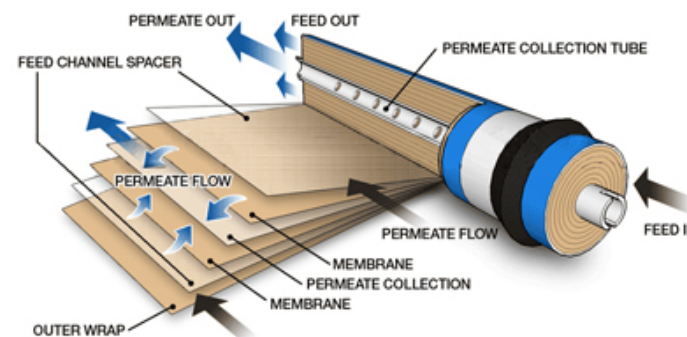
## Hybrid CT for Geothermal application



## Materials for steam condenser & heat exchangers



## Water treatment systems



# MATChING approach and methodology

## MATChING

**WP8.**  
Exploitation & Dissemination

**WP7.**  
Validation & Cost/benefits analysis

### Geo-Power Plants

**WP3.**  
Low-T  
Geo-  
Sources

**WP4.**  
High-T  
Geo-  
Sources

### Thermal Power Plants

**WP5.**  
Condenser  
& cooling

**WP6.**  
Water  
Treatment

**WP2.**  
Targets, KPI, Scenarios

**WP1.**  
Project Management

## PROJECT LEVEL

### First step

Identification of technical and economical  
real success indicators (KPI);  
Definition of the scenarios (present and  
future).

### Second step:

Strong demonstration program with 9 test  
pilots.  
Laboratory scale investigation, new pilot  
plants /existing facilities, AND Full SCALE  
DEMO

### Third Step

Assessment of results coming from  
second step allowing the **techno  
economical validation of solutions**  
applied in selected European power  
plants in consideration of the present  
and future scenarios

KPI

DEMONSTRATION

COST BENEFIT AN.

## TECHNOLOGY LEVEL

### First step

Pre-testing activities in Laboratory. First  
screening of candidate  
materials/coatings/membranes/ pre-  
treatment process to select most promising  
ones for further demonstration

### Second step:

Characterization and test in pilot scale  
facilities mimicking full scale operating  
conditions.  
Selection of the two/three most promising  
options

### Third Step

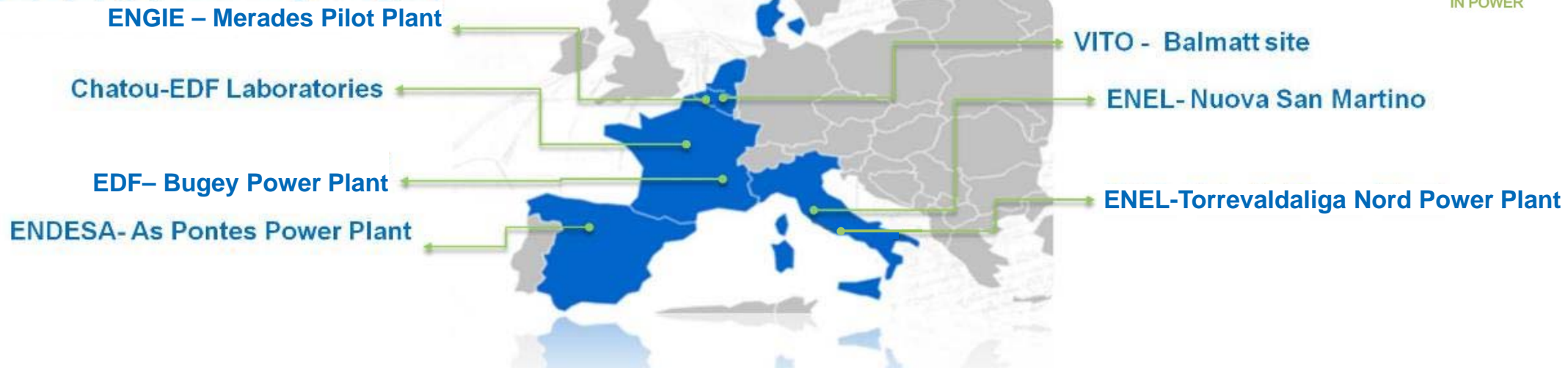
Real Environment test in Power Plant  
and long run test (i.e. through by-pass  
of existing components, or even by  
replacement of full scale modules)

LAB.

PILOT

REAL ENVIRONMENT

# Demonstration program



Coatings for geothermal heat exchangers	Membranes for water recovery from FGD	Hybrid CT for geothermal application	Coatings/materials for steam condenser and membranes for cooling water treatment	Coatings/materials for steam condenser	Membrane condensor	Membranes and technologies for cooling water treatment
						
Balmatt in Mol, Belgium	Torrevaldaliga Nord Italy	Nuova San Martino, Italy	As Pontes, Spain	Chatou, France	Bugey, France	Bruxelles, Belgium



# Acknowledgement



Thanks to all MATCHING Partners and our Stakeholders Community:

Kick Off Meeting Picture





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**MATCHING Group on **

**Main Contacts:**



**daniela.galla@enel.com**

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