Upgrading and Life Cycle Extensions of Geothermal Energetic Pumps and Turbines by Thermal Spray Process and Multi Composite Technology

International Conference “Achievements and future steps”
Bucharest, December 10, 2015
Project summary

- Project Promoter: METAV Research and Development s.r.l
- Project Partners:
  - P1 University POLITEHNICA of Bucharest, Romania
  - Materials Science & Engineering Faculty
  - P2 TEHNOID COM – Romanian SME Partner
  - P3 INNOVATION CENTRE ICELAND (ICI) Reykjavik
  - P4 ON -Nesjavellir Geothermal Power Plant, Iceland
  - P5 VÉLVÍK EHF Precision machining, Iceland SME
- Budget: 864,100 euro
- Duration: 2014-2017
- Objective:
  - Current development efforts are concentrating around several problem areas including: powders and composite structures thermal spray HVOF and ASP plasma-forming of graduate structures, wear resistant materials to rotors restoration and life extension of geothermal turbines.
  - The main expected output of the project are the development of an innovative technology to obtain complex matrix composites with greater corrosion, oxidation and wear resistance up to operating geothermal steam conditions.

- Target groups/end-users of projects results:
  - Geothermal power plants.
  - Technical & Scientific community involved in R&D of knowledge and technologies in the field of geothermal and renewable energies.
  - Public authority, administration and institution in charge of policy regulation in the field of geothermal energy.
Programme RO14 - “Research within Priority Sectors”

METAV R&D – Project Coordinator

University POLITEHNICA of Bucharest
Materials Science & Engineering Faculty

TEHNOID
Romanian SME Partner
Programme RO14 - “Research within Priority Sectors”

Iceland
Innovation Centre Iceland
Keldnaholt facility, Reykjavik
Nesjavellir Geothermal Power Plant (ON)

VÉLVÍK EHF - Precision machining

www.velvik.is
**Project outcomes (planned vs. achieved)**

**expected outcomes:**

To develop new material classes, methods and models suitable to fabricate, monitor, evaluate and predict the performance and overall energy efficiency of novel composite corrosion barrier coatings (CC₃B) prevention in turbines geothermal systems.

**outcomes to date:**

- Routes to obtain complex powders with high wear resistance, thermal shock, abrasion geothermal conditions. Date: December **2014**.

- Experiments of synthesis and obtaining of powder complex mixtures for thermal spray deposition & In situ Iceland tests. Date: June **2015** and December **2015**.

- Pre-industrial experiments regarding the obtaining pumps and geothermal turbines components protected with coated layers obtained by thermal depositions. Date: December **2016**.

- Evaluation and characterization of obtained results in pre-industrial experiments. Date: April **2017**.
Reflections on partnership

- role and contributions to the project of PP/pp,

GEOTUR research program are set out to create benefits on several levels: Programme Operators, Project Promoters, project partners as well as researchers. Interchange including postdoctoral candidates and postgraduates (PhD. candidates) and graduates (Master level) in the additional Programme RO-15 – Regulation EEA 2015.

- strong points and weak points

We realised and signed Partnership agreement regarding the participation of the Iceland University to GEOTUR project activities.

European dissemination and knowledge transfer from universities/R&D performers will be realized by rapid results access by the project meetings, progress reports and technical reports.

- what could be improved

Encouraged bilateral European cooperation in green energy areas of mutual benefit. A number of stimulation actions of transnational cooperation is necessary taken place with Romania, Iceland and others Eastern Europe countries.
Future steps

- European dissemination and knowledge transfer from universities/R&D performers will be realized by rapid results access by the project meetings, progress reports and technical reports.
- The development of a knowledge-base platform Romania-Iceland for optimization of multi-composite thermal spray processes deposition, surface finishing, for improving productivity and cost performance in geothermal power plants.

Sustainability of consortium

- The bilateral and synergetic GEOTUR project is dedicate to complementarities scientific Romania-Iceland research cooperating on the global green energy development, improving capacity at national and regional level and synchronizing the effort to obtain more access of geothermal energy.
- Can help implementing the EEA–RO14 Programme as regards smart specialisation priorities for which there is need for complementarities with innovation actors in other European regions as identified of macro-regional strategies in geothermics platforms activity.
- **GEOTUR** Project allows plans for transnational programme coordination in any part of the entire research-innovation cycle, and joint applications proposal project in Horizon 2020 topics.
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Global areas of the geothermal resources to sustainable energy system
*www.geothermal.office*

Geothermal Iceland areas with temperature exceeding 250°C at 3 km depth.

Geothermal Romania areas with temperature exceeding 140°C at 3 km depth.

Acknowledgements

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Thank you for your attention!

http://metav-cd.ro/geotur/