

PANAMA

Prescriptive analytics and advanced workforce management for optimized O&M of solar power plants

Project duration: from 07.2020 to 12.2022

Report submitted: 10.2022

Publishable Summary

Like many other industries, failures in the operation of a solar power plant result in unexpected breakdowns and loss of production and income. Because of unexpected breakdowns, 55 % of the maintenance works are based on reactive maintenance. Regular and scheduled works, the so called “preventive maintenance”, correspond to 31 % and predictive maintenance has currently got a fraction of 12 %. All these maintenance schemes are based on three data analytics techniques which are descriptive (what happened), diagnostic (why it happened) and predictive (what will happen). However, all this only assist on a limited basis. It is in the interest of asset owners and managers to take this further to a solution-oriented maintenance approach which gives the answer to the question: What action should be taken? Prescriptive analytics provides recommended actions based on prior outcomes, where a recommended course of action to achieve a specific outcome. Hence, “prescriptive maintenance” comes into play where it helps adding the ability to give advice to the technician on what to do and how to repair by taking advantage of artificial intelligence (AI) and machine learning. In this project, an O&M suite which utilizes prescriptive analytics, advanced performance monitoring and mobile workforce management tools for solar power plants shall be developed, validated, and demonstrated in an operating environment. The prescriptive maintenance tool shall predict faults using machine learning and AI. It shall also detect the faults, locate them, and provide necessary recommendations to the technical teams on site helping them to solve the problem in the most proper way and short time. If necessary, it shall also assign the works in an automated way. This workforce management tool will guide the technical teams at site to solve the problem with advance visualization capabilities as well as online guidance from all the teams even at different locations.

Project consortium

Coordinator and all contact details:

| | |
|---------------------------------------|---|
| Full name of organisation | INAVITAS Enerji Anonim Şirketi |
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Participating countries and financing:

| Country | Number of organisations involved | Project costs in EUR | Public funding in EUR |
|--------------|----------------------------------|----------------------|-----------------------|
| Turkey | 2 | 110 696 | 83 020 |
| Austria | 1 | 226 701 | 136 020 |
| Greece | 1 | 122 600 | 122 600 |
| <i>Total</i> | <i>4</i> | <i>459 997</i> | <i>341 640</i> |

Funding agencies involved and contracts

| Funding Agency | Contract N° and Title |
|----------------|---|
| TUBITAK | <u>Project N°:</u> 9190043 <u>Project title:</u> «Güneş Enerji Santralleri Bakım ve Onarım Süreçlerinin Optimizasyonu için Tanımlayıcı Analitik ve Gelişmiş İşgücü Yönetimi» |
| FFG | <u>Project N°:</u> 873791 <u>Project title:</u> Prescriptive analytics and advanced work force management for optimized O&M of solar power plants |
| GSRT | <u>Project N°:</u> T11EPA4-00012 <u>Project title:</u> «Καθοδηγητική αναλυτική και προηγμένη διαχείριση του εργατικού δυναμικού για βελτιστοποιημένη λειτουργία και συντήρηση ηλιακών σταθμών παραγωγής ενέργειας» |