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

Project duration: from 07.2020 to 12.2022
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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, assistance is only provided 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? Recommended actions based on prior outcomes are provided by prescriptive analytics, where a recommended course of action to achieve a specific outcome. Hence, the ability to give advice to the technician on what to do and how to repair is added by "prescriptive maintenance," 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 has been developed, validated, and demonstrated in an operating environment. A prescriptive maintenance tool has been developed within the project which can predict faults using machine learning and AI. It can 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. It can also assign the works in an automated way. On the other hand algorithms have been developed by AIT which can detect and classify system performance failures and performance loss trends. All of the results of the failure detection and degradation algorithms and prescriptive maintenance tool were integrated to the work force management tool so that the workforce management tool can 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:

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Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Turkey	2	89 001	66 751
Austria	1	228 510	136 020
Greece	1	122 600	87 686
Total	*4*	*440 111*	*290 457*

Funding agencies involved and contracts

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