

# Data-driven renewable asset onboarding

19 September 2022, 13:31

**Renewable energy systems are characterised by production modules, supplied by different manufacturers, producing event logs in their own format. This lack of standardisation hinders the efforts for optimising the monitoring and operations of the underlying assets. Sirris has been collaborating with 3E, in order to give automated support to their operations team for onboarding new PV plants in their SynaptiQ management and analytics platform.**

The risk of energy shortage is discussed at all levels currently, from residential homes to the highest governmental gatherings. In order to reach a higher level of energy autarky, sources of renewable energy are indispensable and so are their optimised operations, in order to maximally replace electricity gained from fossil sources. However, renewable energy systems, and large photovoltaic (PV) plants in particular, are characterised by production modules (e.g. inverters) supplied by many different manufacturers and producing event logs in their own format. This lack of standardisation hinders in turn the efforts for optimising the monitoring and operations of the underlying assets.

In the context of the European research project Arrowhead Tools, the EluciDATA Lab of Sirris has been collaborating with Brussels-based company 3E in view of providing automated support to their operations team for onboarding new PV plants in their SynaptiQ management and analytics platform.

## Lack of standardisation

SynaptiQ allows development, operational asset management and analytics of renewable energy projects. Through it, 3E manages 12 GW of PV solar installations in 24 countries. 3E boasts a long track record of innovation in the areas of renewable energy installations, smart power systems and energy-wise process improvements. The fact though that components sourced from different manufacturers lack standardisation and generate data in different formats and levels of granularity, makes the onboarding of newly installed assets time-consuming as several manual configuration steps d slows down the ef

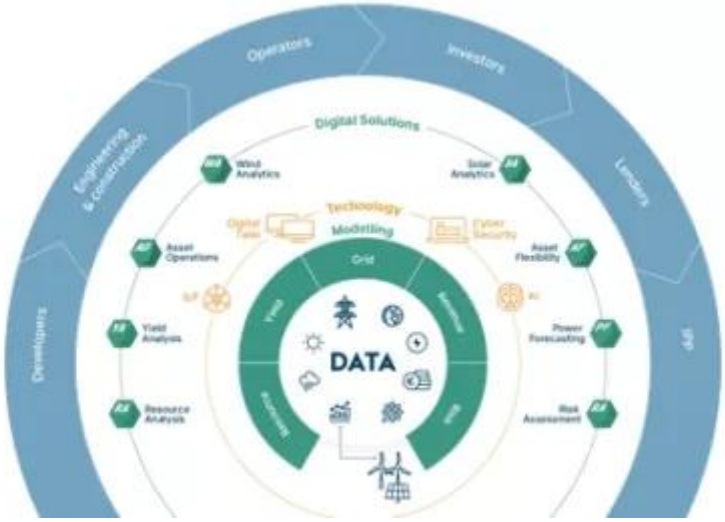



Figure 1: 3E's SynaptiQ solution in a nutshell. ©3E

## Configuration support based on available data

Within the Arrowhead Tools Belgian consortium, 3E and Sirris focused on facilitating the configuration of newly installed PV plants by recommending configuration settings for newly installed assets, based on the information available for previously and correctly installed similar assets. For this, the approach under research consisted of two steps: first, the actual data file format provided by the renewable energy asset was detected and the configuration on how to read this specific file was inferred. Second, a coherent mapping for the information provided by the asset to the corresponding fields in the SynaptiQ platform was suggested.

In the first step, the configuration file might be provided in formats such as a CSV or XML, and to properly read its content the correct format of its different fields (e.g. timestamp information) needs to be automatically inferred. To this end, Sirris used a combined approach following techniques from the fields of text mining and recommender engines, which learns from former correctly installed assets as well as error logs provided by 3E. With this approach, it was for example possible to identify identifiers in unstructured text without prior knowledge and the need of named entity recognition. One of the major challenges was given by the fact that the data was highly unbalanced, as not every PV plant manufacturer is equally likely, such that some data resampling had to be performed. Further, not every plant sent the same kind of information, such that the actual number of parameters to configure varied across different assets.

In the second onboarding step, consisting in finding a coherent mapping between the field names provided by an asset and the standardised names available in SynaptiQ, Sirris investigated how feature-driven supervised classification models could be used in order to add meaning to the measurements. Thanks to these models, we tried to answer questions such as: does the data provide information about voltage or irradiation and what kind of asset provided the data? In this way, it was possible to automatically increase the level of normalisation and standardisation of

variables across assets from different manufacturers.

Once these approaches will be fully implemented, 3E estimates to reduce the time needed by its operations team for onboarding new PV assets by 50 %.

*Would you like to ease the configuration of new or incorrectly configured (and hence faulty) ormation available*







## Authors