

OASES

(01/07/2023 * – 31/01/2025)

* COMMON START DATE AFTER DELAYED
CONCLUSION OF CONSORTIUM AGREEMENT



LEAP-RE

Long-Term Joint EU-AU Research
and Innovation Partnership on Renewable Energy

Pillar-1 project



The LEAP-RE project has received funding from the European Union's Horizon 2020 Research and Innovation Program under Grant Agreement 963530.

Consortium

The highly qualified consortium consists of seven institutions from five countries.

1. *Fraunhofer IEE (Germany)*
2. *Uni Kassel (Germany)*
3. *VTT Technical Research Centre (Finland)*
4. *Council for Scientific and Industrial Research (CSIR) (South Africa)*
5. *University of Venda (South Africa)*
6. *Helwan University (Egypt)*
7. *Centre de Développement des Énergies Renouvelable (CDER) (Algeria)*

Aim of the project

The development and demonstration of a sustainable AU-EU energy system modelling ecosystem based on open software and open data. The workflows will be demonstrated in energy case studies of varying scales that can be replicated by local actors using the project's code, data, tutorials, and documentation.

Relevance vs MARs

The project addresses especially MAR 1 “Mapping joint research and innovation actions for next-step development of RES and integration of RES in sustainable energy scenario”.

The open data generated is also valid for MAR 3 “Smart stand-alone systems” and MAR 4 “Smart grid (different scales) for off grid application”.

Overall: Development and demonstration of a sustainable AU-EU ecosystem including a well proven energy system modelling chain

- 1. Provision of data concerning already installed renewable energy systems via satellite detection of wind and pv plants (machine learning)**
- 2. Generation of open time series data for wind energy and solar PV. Generation of suitable tool chain that will ease integration into energy system mode (FlexTool)**
- 3. Easy-to-use energy scenario modelling workflow for local, national, regional and continental scales**
 - all partners can run it
 - six case studies
 - further development of IRENA FlexTool
- 4. Foundation for a long-term mission**
 - open source and data strategy / WebGIS application
 - example case studies for local actors to use as template
 - AU-EU stakeholder linked with OASES / six concrete capacity building actions

- **WP 2: Earth observation-based RES detection**
 - development of RES detection model (WPP, SPP) / training and testing of results
 - submission for peer-reviewed publication for PV-segmentation
- **WP 3: RES potential analysis**
 - completion of methodology for climate downscale and time series generation
 - completed report for circulation among the team
 - initiative for RES potential analysis with scenario-based extension modelling
- **WP 4: Energy Modelling for different spatial scales**
 - implementation of new features to IRENA FlexTool
 - improvement of documentation and tutorials
 - two case studies on local scale (internal) / concept for two national case studies
 - conception and implementation of a modelling workshop
- **WP 5: Dissemination, demonstration and capacity building**
 - detailed dissemination and communication plan (incl. capacity building)
 - stakeholder list and concrete plans for their involvement

OASES



LEAP-RE

Figure 1: WPP detection in high-resolution aerial images [WP 2].

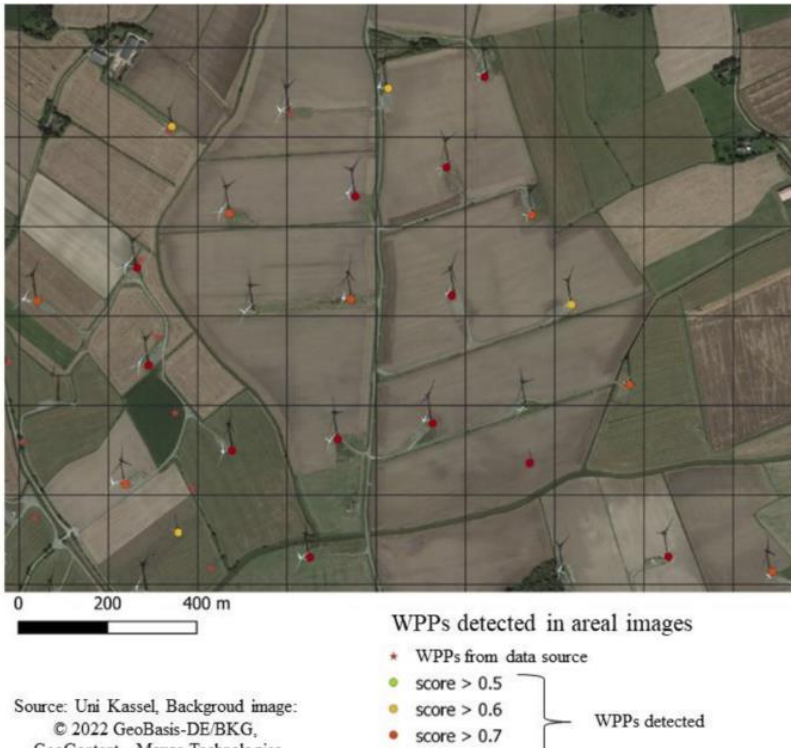


Figure 2: PV potential analysis (South Africa). Preliminary [WP 3].

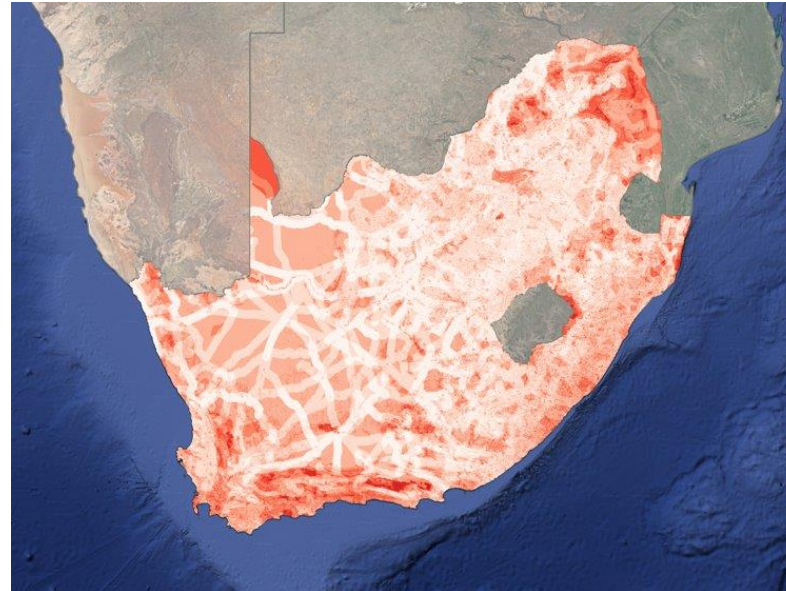
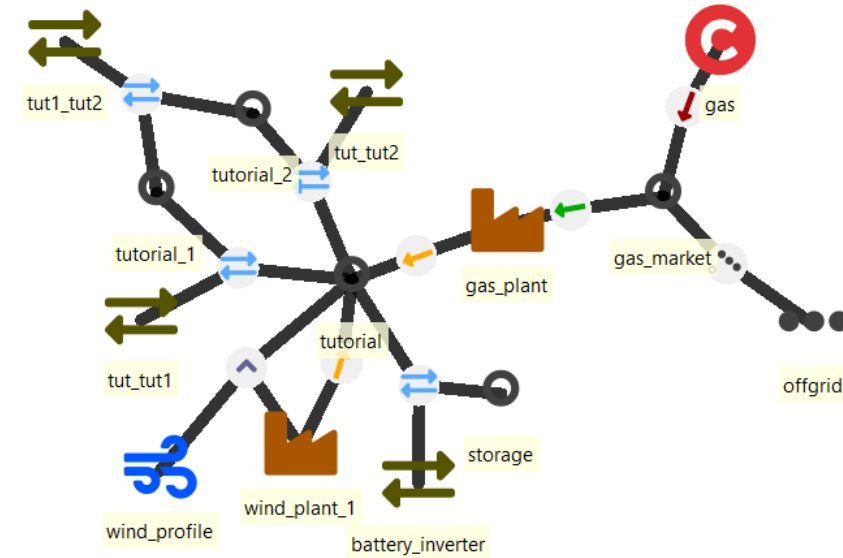


Figure 3: Entity graph of simple energy system model in IRENA FlexTool [WP 4].



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completed
in progress
pending

➤ **Increase in TRL / new developments (methods, software)**

PV segmentation

User friendly code will be available after publication of peer-reviewed paper

Conversion of weather data into energy system mode data

Expansion of capabilities of Atlite

Energy system modelling

IRENA FlexTool includes nested solving windows (investments, long term storage)

➤ **Possible evolutions of the objectives in progress of the project (explain),
problems encountered during the project**

Delayed consortium agreement

New start date 5 months later (01/07/2022)

Funding not received

The Egyptian partner still did not receive the funding from the national agency (ASRT). The LEAP-RE secretariat is informed as well as the German funding agency (they try to help). However, this is a major issue, even though the HU team is quite helpful. The WP 5 is crucial for the project. Solution needed.

End of project expected results (2025)

- **Planned follow-up work / looking for new funding**
 - successor of OASES (including hydrogen?)
 - we are currently looking for a new funding opportunity
 - strategic approach thanks to local actors (especially HU)
- **Become of the consortium set up on this project**
 - the consortium gets along very well (professional / personal)
 - exchange in matter of other projects
 - six of seven members want to continue working together
- **New collaborations and planned future collaborations**
 - planned publication: satellite-based PV segmentation (UniKS, CSIR)
 - formal declaration of cooperation between CSIR and HU
 - close cooperation regarding flextool (VTT, CSIR, HU, CDER)
 - further formal declarations of cooperation between various institutions are planned (e.g., staff, student exchanges)

Expected outcomes in case of success of the project (2030)

1. Technological development

- resource assessment is still crucial for some sources
- distribution is an important area for research and innovation when dealing with integration of renewables via smart hybrid mini grids
 - off-grid integration
 - long-term integration within the national grid

2. Renewed attention to energy scenarios and policy

- vital for understanding the contexts in which technologies and energy solutions will be developed
- helping to minimize unforeseeable consequences
- clear need to support further research and capacity building on energy scenario analysis
 - modelling approaches
 - tools that support policy and decision makers to build a long-term plan at country and regional level

Contribution of the project to AU – EU R&D partnership

- existing and upcoming collaborations between AU – EU institutions established in the context of OASES project
- intention for new intercontinental project
- planned capacity building actions to enable the African partners to use the technology developed
- IRENA FlexTool as an easy-to-use energy system modelling tool capable for the challenges on the African continent
- regular as well as benevolent exchange between actors from the two continents, also in the context of other projects

Interest of Consortium members in participating in LEAP-RE clustering activities

- there is a general interest for the participation in clustering activities
- results and code of the satellite-based RES detection will be shared (GitHub)
- IRENA FlexTool is publicly available (GitHub); we provide support in using it
- there will be more IRENA FlexTool workshops, other LEAP-RE members are warmly invited to join
- invitation for LEAP-RE members for other trainings (satellite detection, time series generation, ...)

THANK YOU

CONTACT US FOR MORE INFORMATION



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