This newsletter spots the lights on one of the Leap-RE projects that are running to support the development of the Renewable Energy fields in Africa. The project title is **Development and Demonstration of a Sustainable Open Access AU-EU Ecosystem for Energy System Modeling [OASES]** that aims mainly to develop and demonstrate of an open and sustainable AU–EU ecosystem including a well-proven energy system modeling chain to benefit the EU and AU scientists and energy system planners to perform and optimize national scenario analysis on their own.

The OASES consortium consists of: Fraunhofer IEE, Germany (coordinator), Kassel University (Germany), VTT (Finland), CSIR (S.A), Venda University (S.A), CDER (Algeria), Helwan University (Egypt).

The project started in June 2022 for three years based on five main working packages activities:

WP 1: Project's Management and Coordination (Two deliverables)		
WP 2: Earth observation-based RES detection (Two deliverables)	**WP 3**: RES potential analysis (Three deliverables)	**WP 4**: Energy System Modeling for different spatial scales (Three deliverables)
Task 2.1 Development of an earth observation-based RES detection	Task 3.1 Survey of existing data sets and methods	Task 4.1. Documentation and workflow
Task 2.2 Training of the RES detection on high resolution data	Task 3.2 Generation of high-res meteorological time series	Task 4.2 Development of the modeling tools
Task 2.3 Transfer of the trained models	Task 3.3 Distribution of wind and PV plants	Task 4.3 Comparing modeling results with established models
Task 2.4 Application of the RES detection for the case studies	Task 3.4 Generation of wind power and PV time series	
	Task 3.5 Preparation of time series for the case studies	
WP 5: Dissemination, demonstration and capacity building tasks: Seven tasks (Three deliverables)		

Achievement and Progress

WP 2: Earth observation-based RES detection

Kassel University in collaboration with CSIR have succeeded to develop freely accessible tools to detect installed wind energy and photovoltaic systems in EU and AU countries using satellite imagery, digital orthophotos, and machine learning approaches. The generated data and other project's data and tools are adopted to demonstrate six energy case studies in EU and AU. Typical preliminary results are shown in the figure based on a very high-resolution aerial imagery. The results of the applications will subsequently be used for resource assessment as well as to support the spatial distribution of new wind and PV installations and the generation of various time series. Results will be published in an appropriate form during the year.
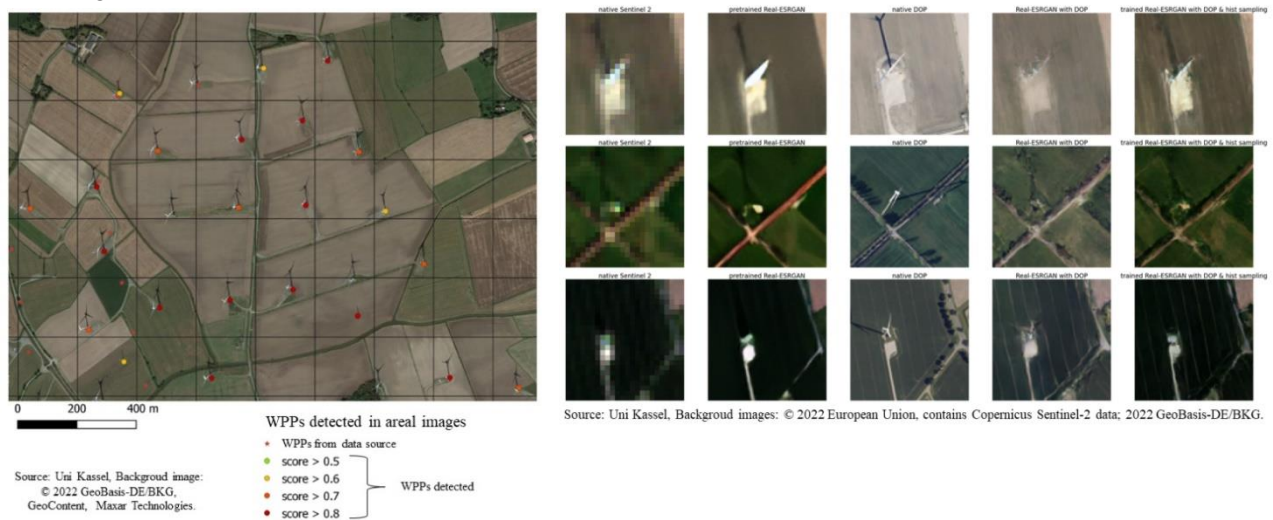

Figure 1: Preliminary result of satellite imagery detection (WG and PV)

WP 3: RES Potential Analysis

Time-series dataset generation is critical in developing energy models and forecasts. The approach, methods, and techniques adopted in generating the necessary data sets source have been explored well by CSIR, the leader of this WP in cooperation with VTT. This included so far:

1. The Prediction of Worldwide Energy Resources (POWER) data set developed by NASA
2. The Global Solar Atlas (GSA)
3. Global Wind Atlas (GWA) Platform developed by the Technical University of Denmark's Department of Wind Energy and the World Bank Group (Global Wind Atlas, n.d.).
4. Time series methods in energy system modeling (time slice, representative years)
5. Dynamical down scaling method for the time series generation RE sets.
6. Statistical down scaling (weather classification, weather generation, regression)
7. Other methods such as: regression model, Delta method, Canonical correlation analysis (CCA), Genetic programming (GP), Cumulative distribution functions (CDFs), etc.
8. Readymade SW packages such as: The Global Forecast System (GFS), European Centre for Medium-Range Weather Forecasts (ECMWF), IBM Global High-Resolution Atmospheric Forecasting (GRAF)
9. ClimaCell's Bespoke Atmospheric Model (CBAM)
10. Weather Research and Forecasting (WRF)
11. Regional model (Korean Integrated Model (KIM), Indian Institute of Tropical Meteorology Earth System Model, National Centre for Medium Range Weather Forecasting
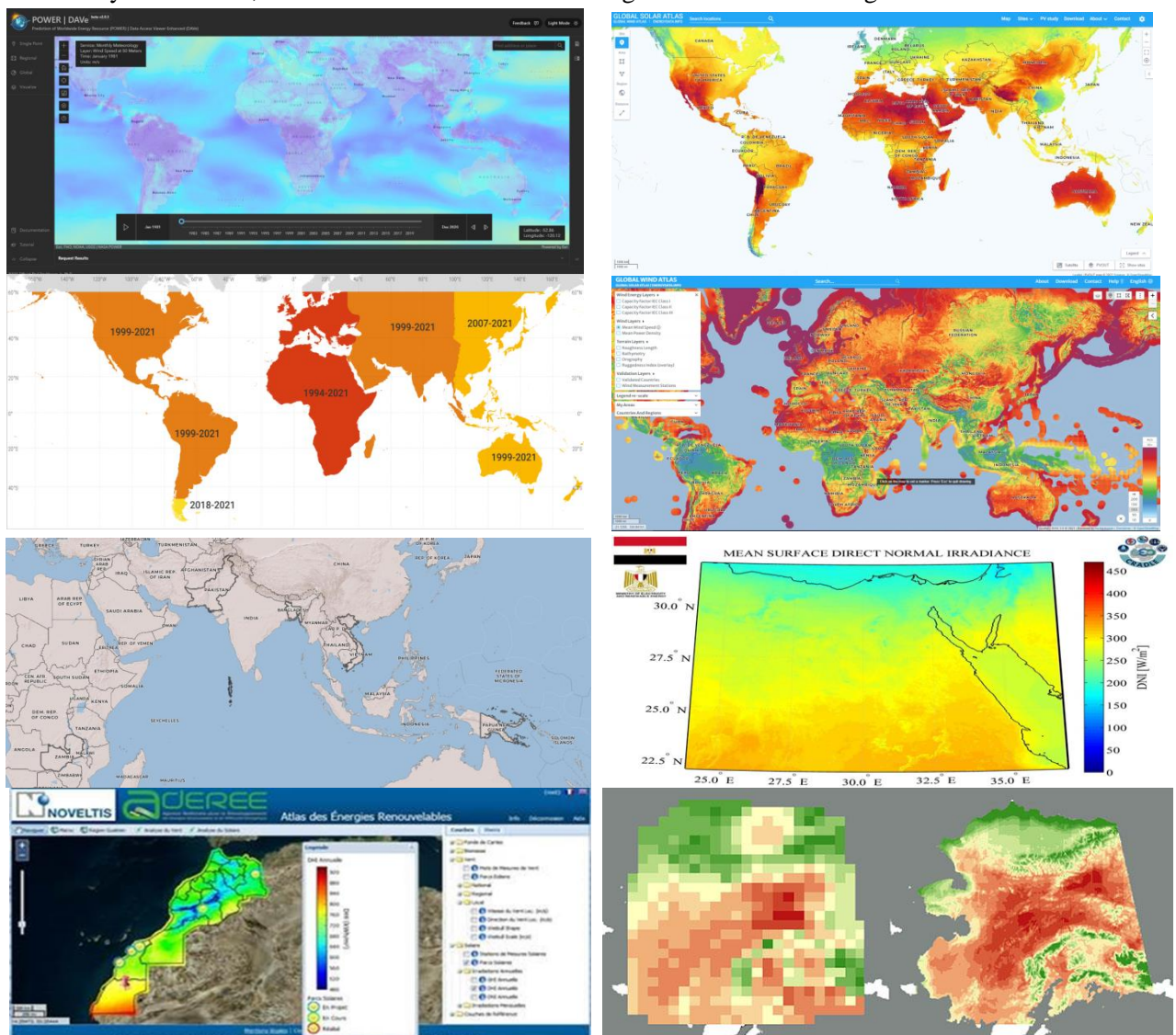

Figure 2: Methods and techniques explored by OASES for time series generation sets (RE modeling)

WP 4: Energy System Modeling for Different Spatial Scales

VTT in cooperation with CSIR, HU, CDER, Uni Kassel, are responsible to develop new modeling workflows for different special scales of RE Ecosystems based on IRENA FlexTool and the new generated data sets sources developed by WP3. In addition, VTT will further improvement of IRENA FlexTool to support and comply with the local conditions of the Ecosystems modeling in African and European countries including:

1. **IRENA FlexTool**
    a. Significant number of new features and bugs have been fixed
    b. The tool is now complete and documented
    c. Tutorial and demo dataset

2. **User interfaces enhancement**
    a. Improvements on Spine Toolbox
    b. Usability of FlexTool web interface (e.g., plotting of results)

3. **Capacity Building and Dissemination**
    a. VTT arranged special FlexTool workshops for partners in September 2022 and case example in WP4 meeting October 2022
    b. Online meetings with CDER in Algeria and Helwan University in Egypt
    c. LEAP-RE clustering events October 2022 and December 2022
    d. News article on website

4. **Case Studies**
    a. Plan of local case studies in Algeria and Egypt (to best serve case studies with templates)

WP 5: Dissemination, demonstration and capacity building

Based on the Dissemination and Communication (D&C) plan prepared by HU in cooperation with all OASES partners have so far made the following progress in this working package (WP5):

> *The LEAP-RE team has established a new website including a section for OASES project as part of the LEAP-RE web page (**https://www.leap-re.eu/oases/**); Additionally, several project partners present the project on their website.*

1. Special Web research page link made by CDER for OASES project dissemination.

    https://www.cder.dz/spip.php?article5263

2. News article on VTT Website for OASES project dissemination.
3. Participation in the activity of practice-based research networks (PBRNs) including:
    a. LEAP-RE Stakeholder Forum, Pillar 1, Pretoria, South Africa, 3rd to 6th October 2022
    b. Online meeting with PyPSA Meets Earth project, 12nd April 2022
    c. Online meeting with First Pillar1 Projects Meeting, 22nd June 2022
4. Regarding the capacity building, the following progress has been achieved:
    a. Three WS training programs for HU and CDER capacity building made by VTT (WP4) on FlexTool dated: 14th September 2022, 15th September 2022, and 31st October 2022
    b. LEAP-RE clustering events in October 2022 and December 2022