

# Resource Assessment: IRENA's geospatial services

A project by the International Renewable Energy Agency (IRENA)

Imen Gherboudj, PhD



### Data gaps

- Data/information exist, but
  - Decentralized
  - Scarce

### Global Atlas initiative

- Facilitate access to renewable resource data
- Capacity building on tools and information



**Shorten the  
project life cycle**



**Accelerate the  
development**



**Optimize development  
and cut costs**

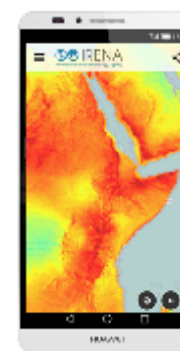
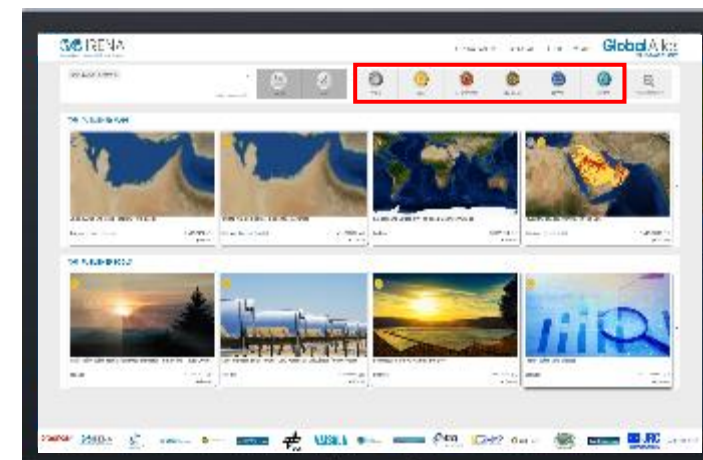


## Global Atlas Renewable Energy – Platform

- Online Geographic Information System tool
- Platform contains over 2000 maps and datasets
  - ❑ Renewable energy resource (solar/wind)
    - Maps
    - Ground-based measurements
  - ❑ Additional datasets
    - Transmission and road networks (OSM) ,
    - Protected areas (WDPA),
    - Population density (ORNL),
    - Land cover and Topography
- Mapping tools (search, draw, download, print, etc.)

**Preliminary overview of the renewable resources**

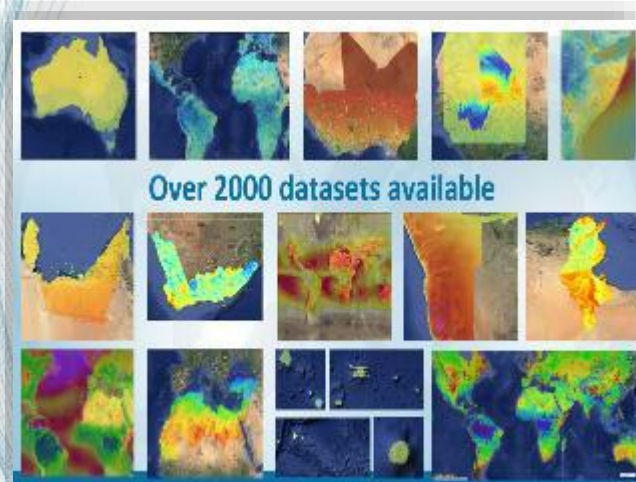
[www.irena.org/globalatlas](http://www.irena.org/globalatlas)



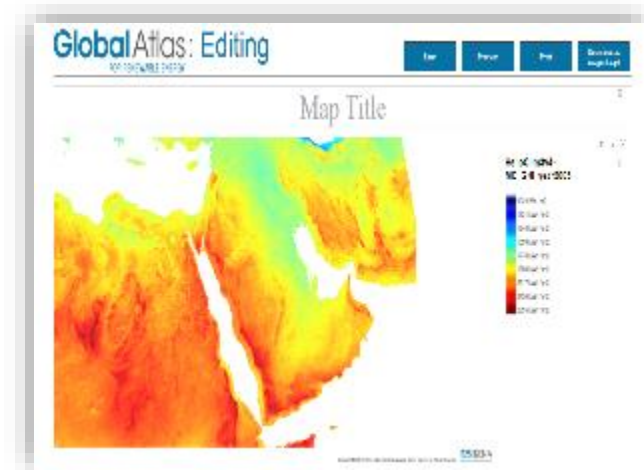
Global Atlas *pocket*  
Mobile App



# Global Atlas Renewable Energy - 3.0 (coming 4.0)



Search the maps and tools in one single entry



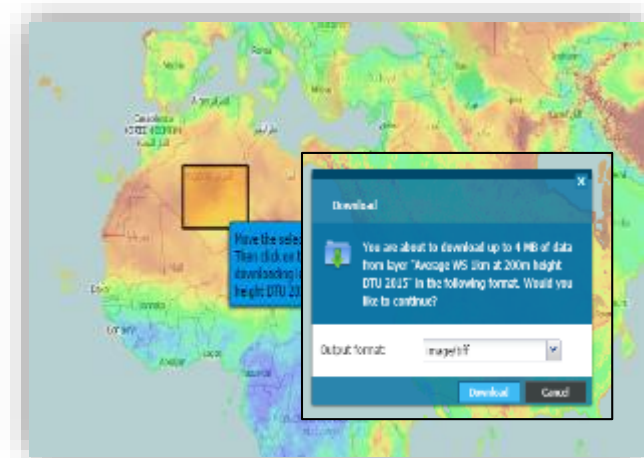
Print and Extract Map Images



Suitability maps for identifying investment opportunities



Bioenergy Simulator



Download data



# Global Atlas Renewable Energy - Partners



The image displays a grid of logos for various partner organizations. The logos are arranged in approximately 10 rows and 8 columns. Some logos include text in multiple languages, such as Arabic and Chinese. The partners include:

- CENER** (National Renewable Energy Centre)
- CLEAN ENERGY MINISTERIAL**
- ESMAP** (Energy Sector Management Assistance Project)
- JRC** (European Commission)
- olade** (Observatoire L'Observatoire de l'Énergie)
- REN21** (Renewable Energy Policy Network for the 21st Century)
- RSE** (Renewable Energy Society)
- prognos**
- SANDER PARTNER**
- WASA** (Water and Energy Research Institute)
- WIND** (International Energy Agency Wind Programme)
- MIEMDNE** (International Institute for Energy Research)
- MINES PARIS ParisTech**
- RCREEE** (Regional Centre for Renewable Energy and Energy Efficiency)
- SOLAR MED**
- giz** (German Development Cooperation)
- IDAIE** (International Development and Energy Agency)
- VORTEX**
- ADB** (Asian Development Bank)
- DLR** (German Aerospace Establishment)
- GeoModel**
- Masdar INSTITUTE**
- reep** (renewable energy & energy efficiency partnership)
- reegle** (information gateway for renewable energy and energy efficiency)
- UNDP** (United Nations Development Programme)
- MIEMDNE** (International Institute for Energy Research)
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Policy makers



Energy planners & administrators



Developers & business leaders



Educators



Climate modelers

Visualise resource potential in countries/regions

Estimate the technical potentials of renewable energy

Estimate the share of energy mix that can be achieved by renewable energy

Determine cost-effective combination of technologies

Determine viability of solar and wind project sites



## Inputs

Global Atlas for Renewable Energy  
(maps or time series)



## Objectives

Generation and transmission  
expansion planning

Project support



## Services

Suitability  
Assessment

Energy generation  
profiles

RE-Site  
Assessment



## Approach

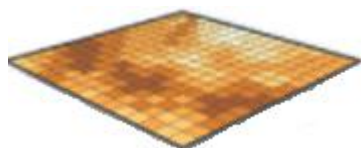
GIS-Based  
MCDA

Power modeling



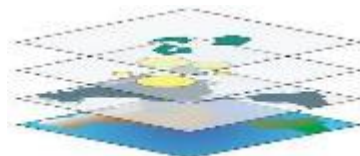


**Renewable Resources**  
Solar or wind



**Excluded areas**

Protected areas, Population density  
Topography, Land cover



**Priority areas**

Distance to grid  
Distance to road

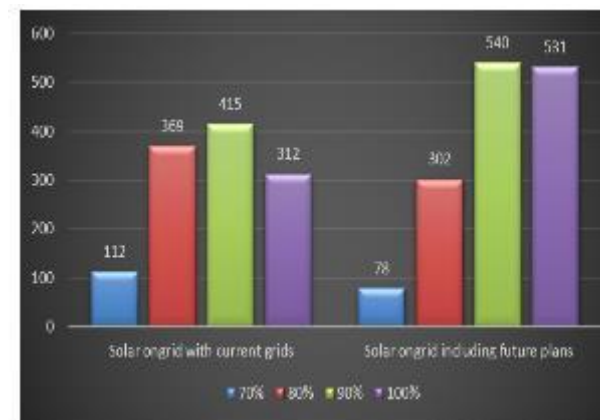


**GIS-Based**



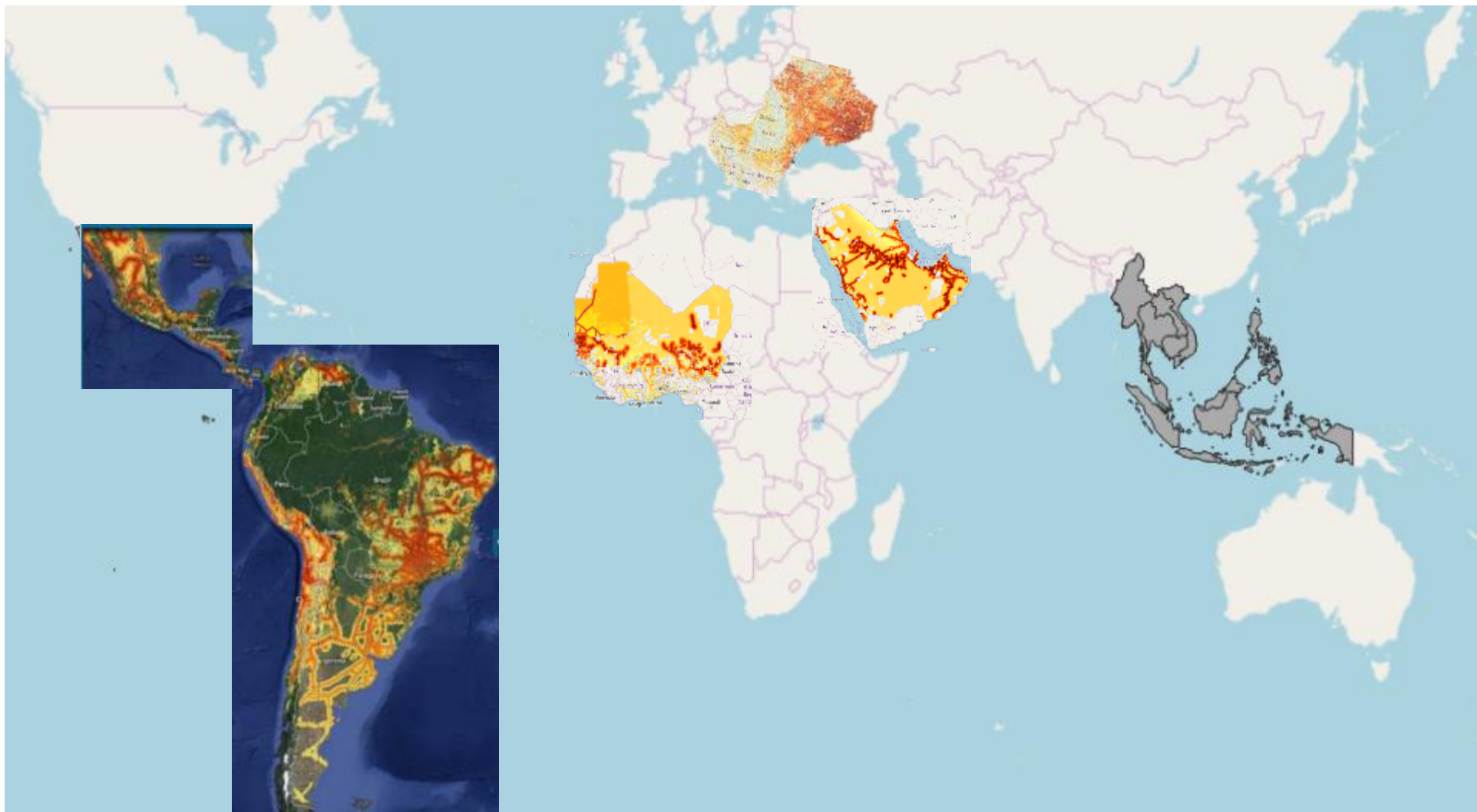
**Multi-Criteria  
Decision Analysis**

**Identify most  
suitable area  
for project  
development**

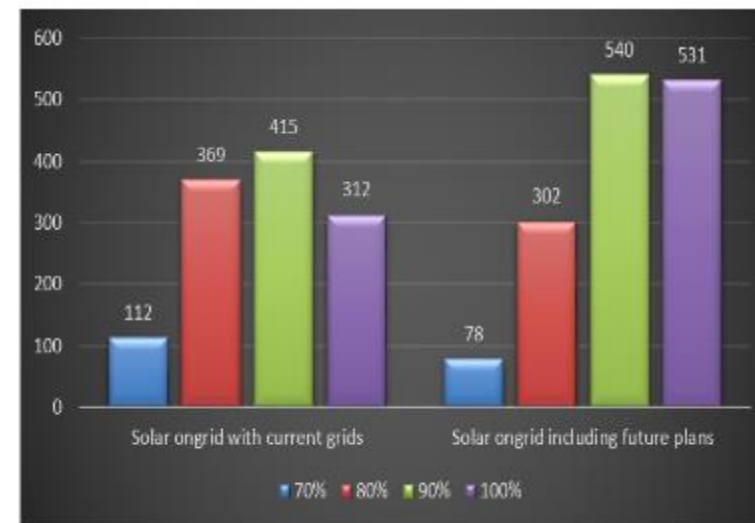
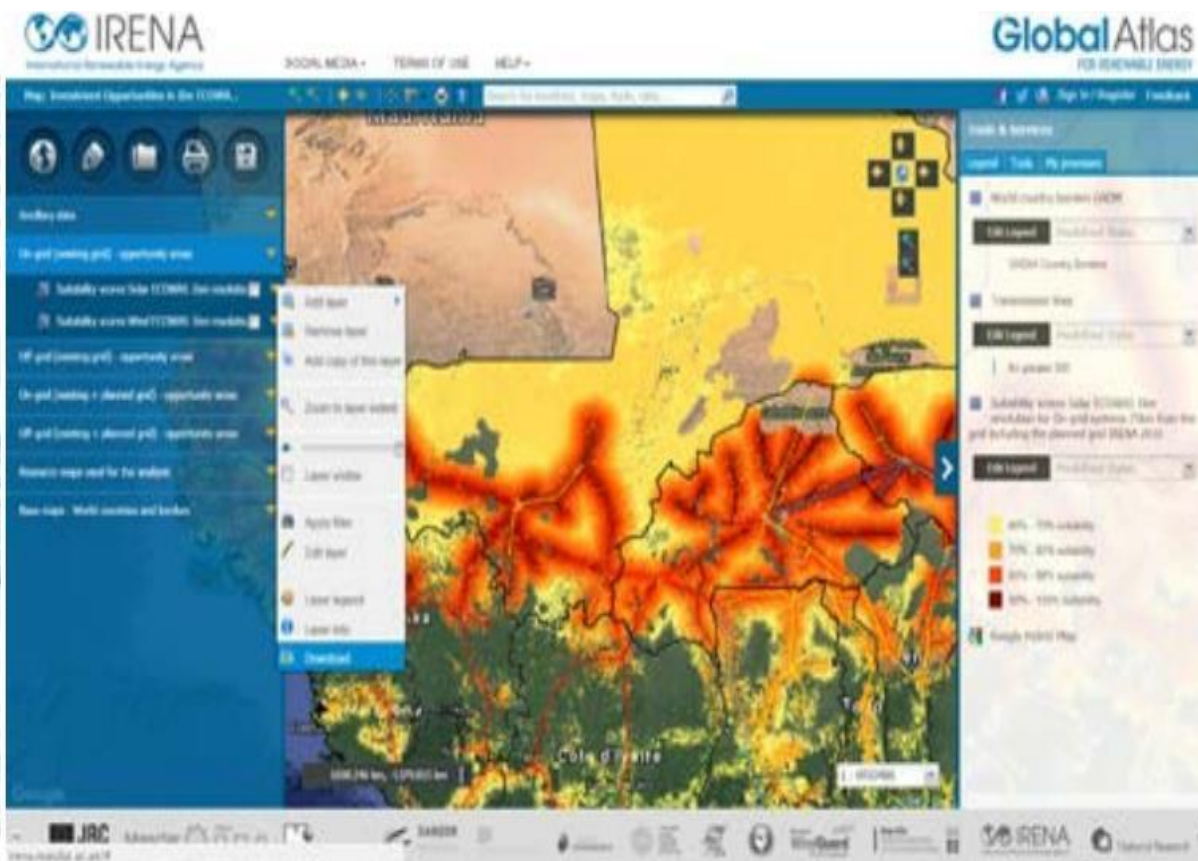


**Technical  
potential  
(GW)**

## Resource Assessment - RE Suitability Assessment



## Sample results – Solar grid connected – West Africa



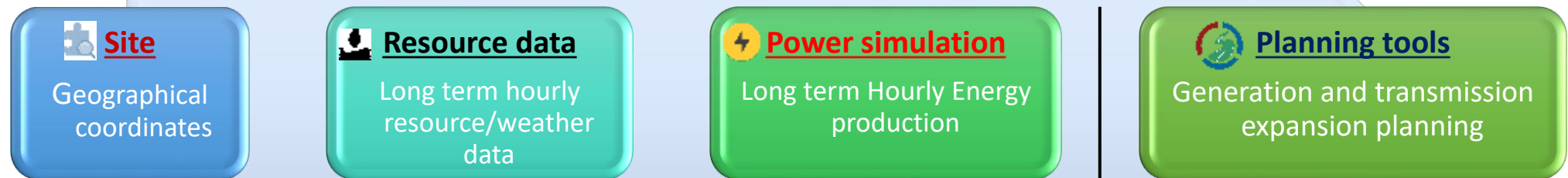
Technical potential (GW)	60-70%	70-80%	80-90%	90-100%	Total
Solar on grid with current grids	112	369	415	312	1,209
Solar on grid including future plans	78	302	540	531	1,451

Figure 4: Technical potential for on grid solar PV in West Africa. The results are presented by suitability class. The left chart shows the technical potential with the current grids, and the right chart includes the grid plans. The future grid developments significantly increase the overall technical potential.

### Objectives

- Simulate site-specific hourly energy generation
- Determine maximum generation capacity

### Approach



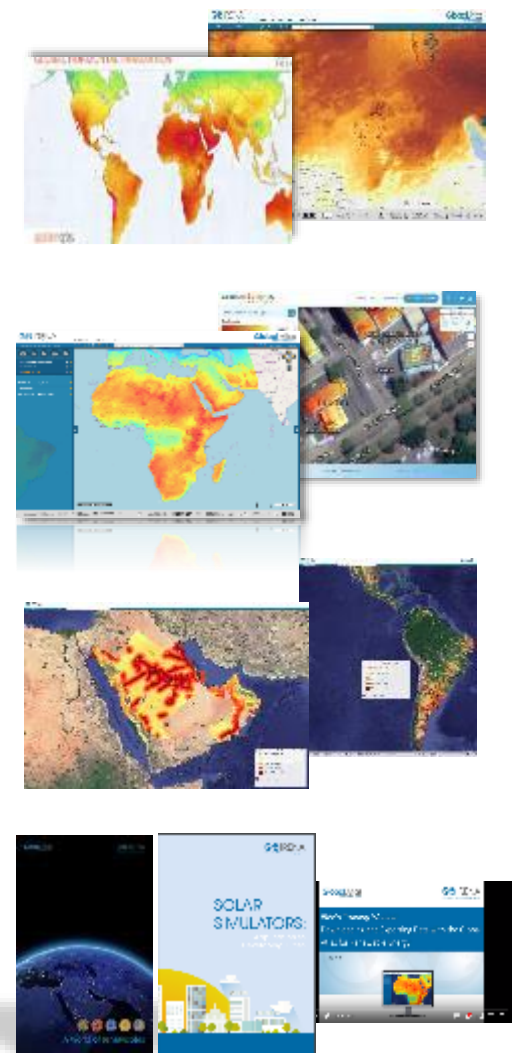
### Examples

- Morocco : Long term hourly energy generation profiles for about 30 sites, achieve their targets of 2030 and 2050.

# Renewable Energy Resource Assessment - conclusion

Attracting RE Investment

	<b>Collecting intelligence</b>	<ul style="list-style-type: none"> <li>• Renewable Energy Resource data</li> <li>• GIS-based data (road, population density, grid, protected areas)</li> </ul>
	<b>Developing applied knowledge</b>	<ul style="list-style-type: none"> <li>• Global Atlas platforms</li> <li>• Geospatial data services</li> <li>• Rooftop Solar City Simulator</li> <li>• Geothermal resource classification</li> </ul>
	<b>Creating enabling conditions</b>	<ul style="list-style-type: none"> <li>• Better resource knowledge</li> <li>• Better decision on optimal zones</li> <li>• Best sites for RE Development</li> <li>• Design smart cities</li> </ul>
	<b>Disseminating</b>	<ul style="list-style-type: none"> <li>• Direct stakeholder engagement</li> <li>• Global Atlas</li> <li>• Publications</li> <li>• Webinar</li> </ul>





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