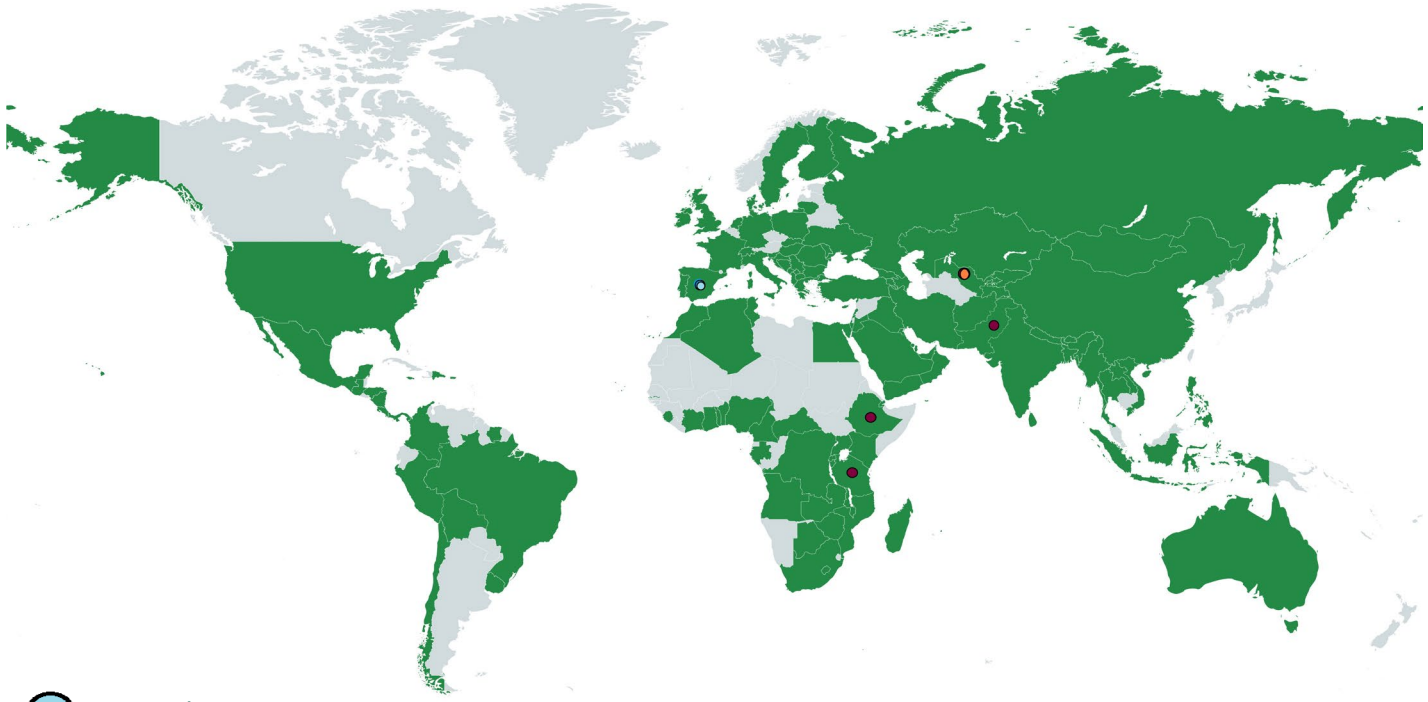


Energy and Water Consultants

Mercados–Aries International.

At a glance…



Headquarters
Representative Office
Project Office

- ✓ Experts in **Energy** and **Water**
- ✓ More than **20 years** of experience
- ✓ Know-how and ownership of **1,600 references**
- ✓ More than **145 countries** in 5 Continents
- ✓ More than **160** highly skilled **professionals**
- ✓ Average Annual **Revenue 15m$**
- ✓ More than **45,000 MW** of Renewables advised
- ✓ Certified **ISO 9001**, 14001 and 45001
- ✓ **Global** Service Offering

Mercados–Aries International.

MAI Values



Mercados–Aries International.

Sectors



ENERGY

Mercados – Aries International is a recognised global leader in energy consulting. We offer a comprehensive portfolio of services and solutions for all client needs within a sustainable vision, focusing on three key areas:

- Policy, Regulation & Strategy
- Networks Studies
- Renewables & Storage

Our 20+ years of experience in the industry allow us to leverage our knowledge and resources to provide governments, private clients and donors with strategies and solutions that can successfully guide them towards energy transition and resilient development, employing new technologies for a low-carbon future.

References in Energy



WATER

As an important sector for a country's development, the Water sector constitutes a key element for a sustainable future.

Our journey in this sector began hand in hand with our energy projects, mainly in services related to tariff management and planning, to subsequently evolve into more technical areas of advisory, to currently offer services in the whole water cycle including feasibility studies, technical advisory, project implementation as well as environmental, social and governance issues.

We provide advisory services with dedicated teams of professionals to work side by side with our clients, integrating and working as one.

References in Water



Services

- Economic Consulting
- Transaction Advisory
- Technical Consulting
- Project Management
- Data Intelligence & Modelling
- Environmental, Social & Governance

What Makes MAI Different?



Global Proximity

- Worldwide international network
- In-depth local knowledge
- We empathize with Client's targets.



Committed to Transition

- Enabling Frameworks
- Renewables
- Storage
- Resilient Low Carbon development
- Human Development



Leading Technologies Experts

- Floating and Bifacial PV
- Desalination
- Stochastic Models
- Smart Grids
- Storage
- In-house modelling solutions



Wide Range of Services

- One-Stop-Shop Consultant
- Economic and technical know-how
- Synergies between Sectors

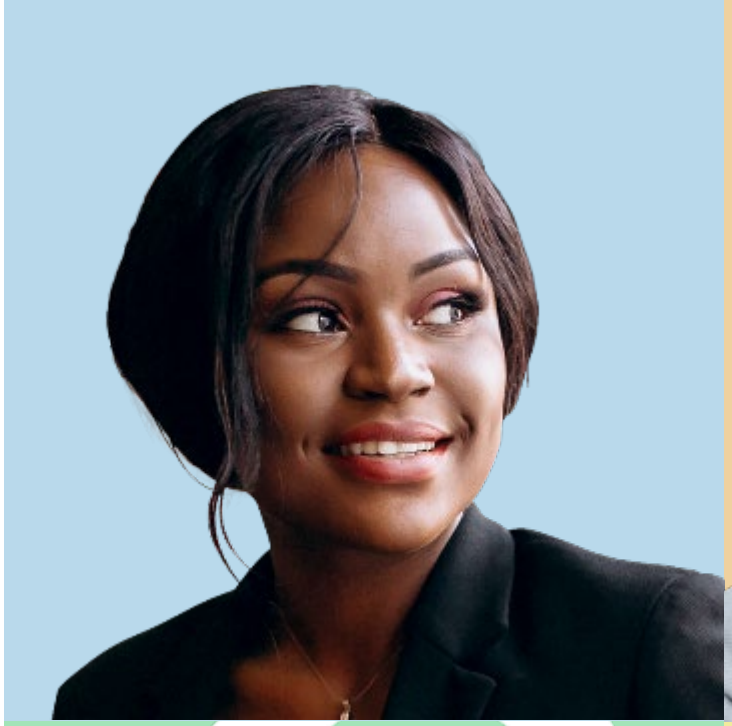
MAI Clients

Governments & Regulators

International Donor Community

Utilities & Associations

Investors & Other Private Clients



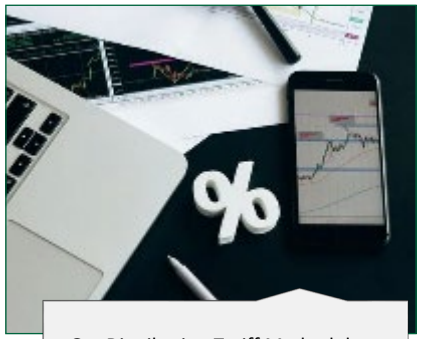




Excerpt of Relevant References



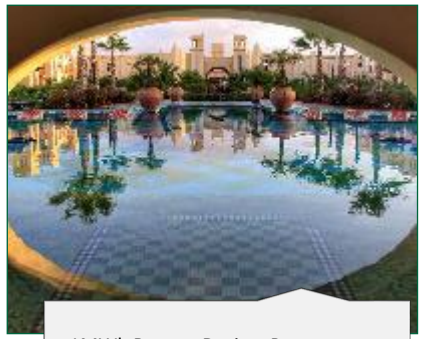
Low-Carbon Pathway for the Power Sector in Kazakhstan



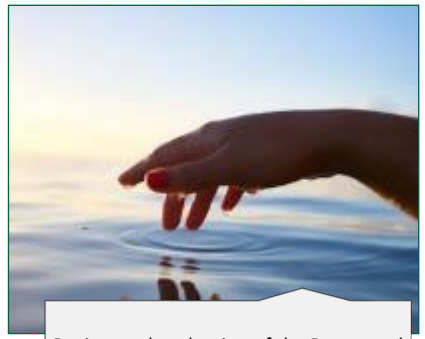
Gas Distribution Tariff Methodology Design in Ukraine



Technical Advisory Micro-grid >10GW Combined Power Generation Project (Wind, PV, Battery, Line) in Morocco



1MWh Battery Design, Procurement and Implementation in Cape Verde



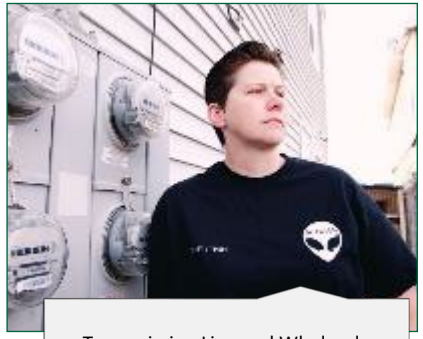
Review and evaluation of the Power and Water Price Reform in Saudi Arabia



Owner's Engineer 50MW Floating PV in Vietnam



Renewables Auctions in Mongolia



Transmission Line and Wholesale Metering Owners Engineer Tajikistan



EEP Operational Effectiveness Improvement in Ethiopa



Owner's Engineer 500MW Wind Farm in Uzbekistan

Mercados–Aries International.

Thank you.

More info at:
www.mercadosaries.com
contact@mercadosaries.com

Mercados–Aries International.

Annex A
Services Details

Economic Consulting

- **Energy & Water Economics**
  - Economic Analysis & Regulation
  - Tariff Calculation & Design
  - Subsidy optimization
  - Demand Studies
  - Master Planning
  - CBAs
  - Litigation Support
- **Business Strategy**
  - Ordena® Modelling
  - Power Market Price Forecasting
  - Dispatch Optimization
  - Investment Assessment
- **Regulatory Consulting**
  - Restructuring and Unbundling
  - Legislation Development
  - Renewable Auctions
  - RE & EE promotion
  - National & Regional Power Markets design
  - Energy Strategy
- **Capacity Building Programs**
  - Study Tours
  - Ad-hoc Training
  - Institutional Development



EU: Study on the role of gas storage in internal market and in ensuring security of supply



Tunisia: Reform of the Power, Gas & Oil Sector



Saudi Arabia: Review and Evaluation of the Water Price Reform



Kenya-Tanzania: Interconnection Tariff Study

Transaction Advisory

- Financial and Economic Due Diligence
- Regulatory Due Diligence
- PPP Design
- PPP Contracts
- Equity & Project Finance Structuring
- Technical Due Diligence
- CAPEX & OPEX Assessment
- Long Term Prices Forecasting
- Yield Assessment
- Incomes Forecasting

Our Due Diligences use the sophisticated proprietary tool **Ordena®** for Power Sector Development, and **MERUM®** in the case of Network Utilities



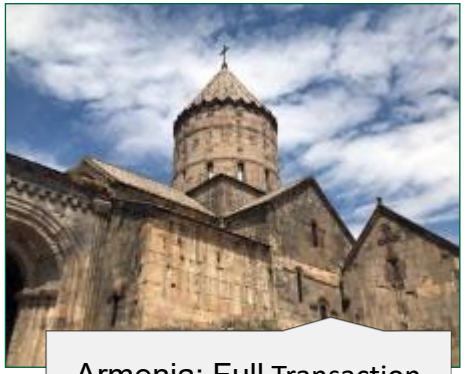
Sweden: Distribution Assets Due Diligence services for a buyer



Pakistan: Technical services for the GEPCO Privatization



India: Gas Trading Support



Armenia: Full Transaction Advisory for PV Tender

Technical Consulting

- Technical Analysis
- Feasibility Studies
- Litigation Support
- Mitigation Measures Support
- Lender Technical Advisor (LTA)
- Independent and Owner's Engineer
- Tariffs Technical Studies
- Loss Reduction Plans
- Assets Management
- Capacity Building
- Solar & Wind Resource Assessment
- Power System Studies
- Grid Codes Development
- Energy Mix Optimization

We are experts in the following technologies:

- PV (Conventional, Bi-facial and Floating)
- CSP (Concentrated Solar Power)
- Wind
- Hybrid Systems
- HVAC & HVDC
- Smart Grids
- Storage and P2G
- Waste-Water Treatment (WWTP)
- Desalination
- Potabilization
- Tertiary Treatment of Water



Morocco: Hybridization CSP & PV



Bosnia & Herzegovina: Feasibility Study and Tender Process for EPC Contractor PV Plant



Egypt: Technical Assistance to Support the Gas Sector Reform



Pakistan: Micro Hydro Power Plants Development

Project Implementation Management

- Development of Bidding Documents (RFP, Contracts)
- Tendering and Contracting Support
- Project Verification
- Owner’s Engineer (OE)
- Independent Engineer (IE)
- EPC Management
- FIDIC Engineer
- Lender's Technical Advisor (LTA)
- Full Engineering Design Review
- Construction and Commissioning Supervision
- Witnessing Factory Acceptance Tests



Tajikistan: Transmission Line and Wholesale Metering Owner’s Engineer



The Gambia: Owner’s Engineer and Capacity Building PV, BESS and OHL



Cape Verde: Technical Advisory for Brava Sustainable Island Project Formulation



Tanzania Rural Electrification Expansion Program (OE)

Data Intelligence & Modelling

For 15 years, **Mercados - Aries International** has been developing stand-alone Business Intelligence solutions whose value is recognized by our Clients:

ORDENA® is the MAI in-house developed tool to determine the optimal schedule of generation, transmission, and fuel infrastructure investments in the given area.

MERUM is a software solution for the **optimization of OPEX** and **CAPEX** in utilities. It is a multi-parameter software with algorithms and models to reach the **optimum**.

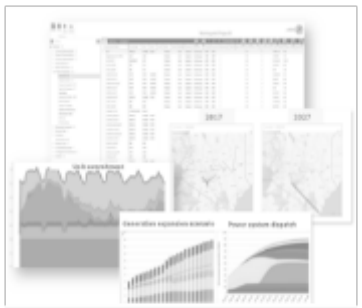
SUNCASTER® is a MAI in-house web solution that offers solar radiation and other weather variables data estimated from satellite images and reanalysis data set.

CORVUS is a MAI in-house developed tool to optimize the Energy Mix with Battery Energy Storage System

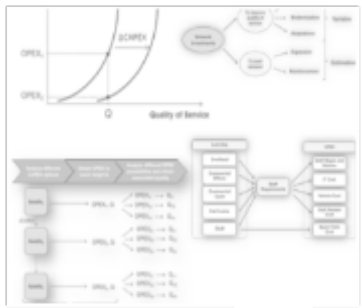
SCADA design, implementation, and operation of SCADA systems related to renewable energy monitorization.

Besides the above MAI has the following Data Intelligence & Modelling:

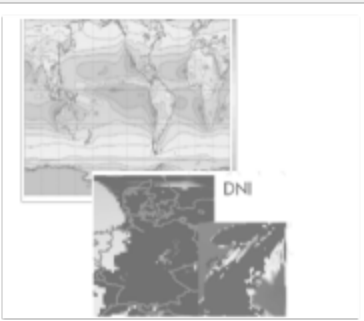
- **PVSyst, WAsP, windPRO, iAuditor, Calcutta, DigSilent and Spatial Load Forecasting (SLF).**



ORDENA®, to forecast long term dispatching and market prices



MERUM, to optimize your OPEX and CAPEX



SUNCASTER, to estimate the radiation for your PV Plant



CORVUS to optimize of renewable energy mix with BESS

Environmental, Social & Governance (ESG)

- E&S Impact Assessment (ESIA)
- E&S Action Plan (ESAP)
- E&S Monitoring
- Mitigation Measures Support
- Due Diligence
- Equator Principles
- IFC Standards
- Assets Sustainability Assessment
- Capacity Building Programs
- Advisory on management and enhancement of performance of utilities
- KPI development and monitoring
- Resilience Analysis



Ukraine: ESIA of a 330 kV line



Ethiopia: EEP cost minimization and Revenue Maximization



Morocco: ESIA of >10GW Combined Power Generation Project (PV, Wind, Battery, Line)



Tajikistan: Management contract for an unbundled Power Distribution Utility

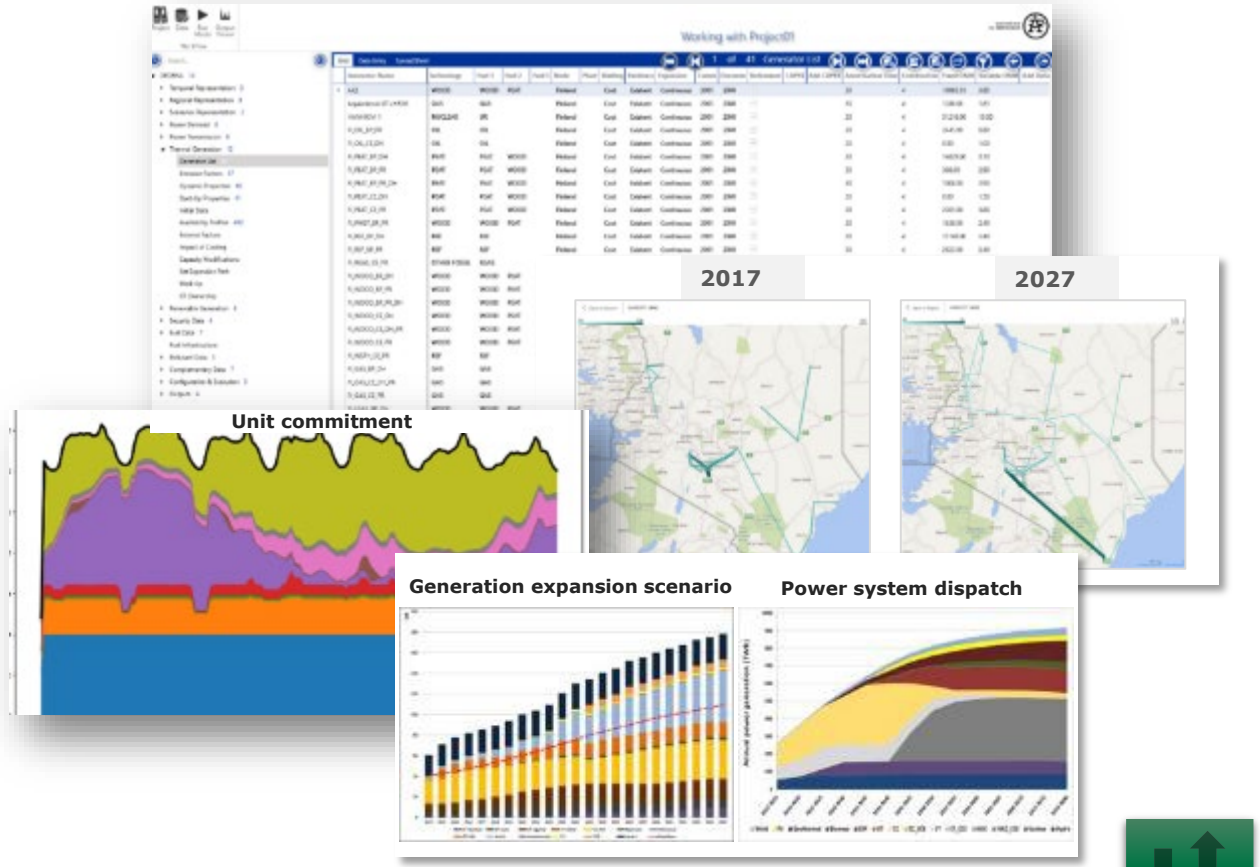
Annex B
MAI DIM Solutions

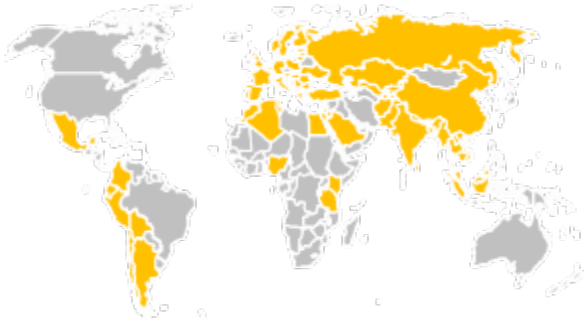
ORDENA ®

ORDENA® is the MAI in-house developed tool to determine the optimal schedule of generation, transmission and fuel infrastructure investments required to supply the forecasted load in an individual country or a multi-region system.

Optimal power system simulation and planning

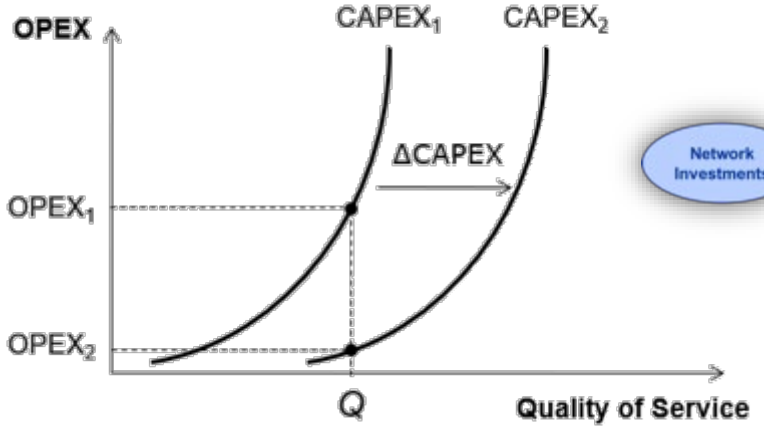
- **Long term Optimal** power joint generation and transmission expansion planning
- **Power market price simulation.** Short term **unit commitment** with hydro and thermal. State-of-art simulation of intermittent RES, hydrogen and storage
- **Extended version simulates** the expansion of energy systems including electricity + Fuels + Gas + Water
- **Database** storage and advanced **analytics**
- Probabilistic **scenario** modelling
- **Proven** in many projects all over the world. Both at regional markets and country level. 20Y+ in use.

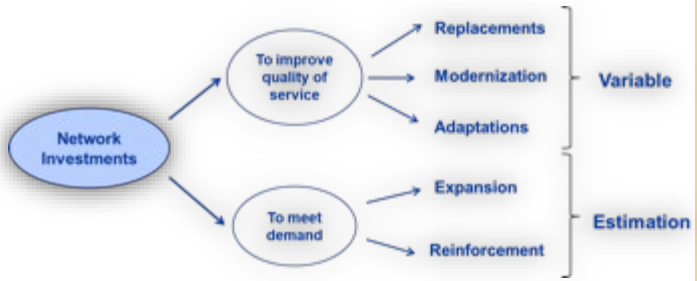


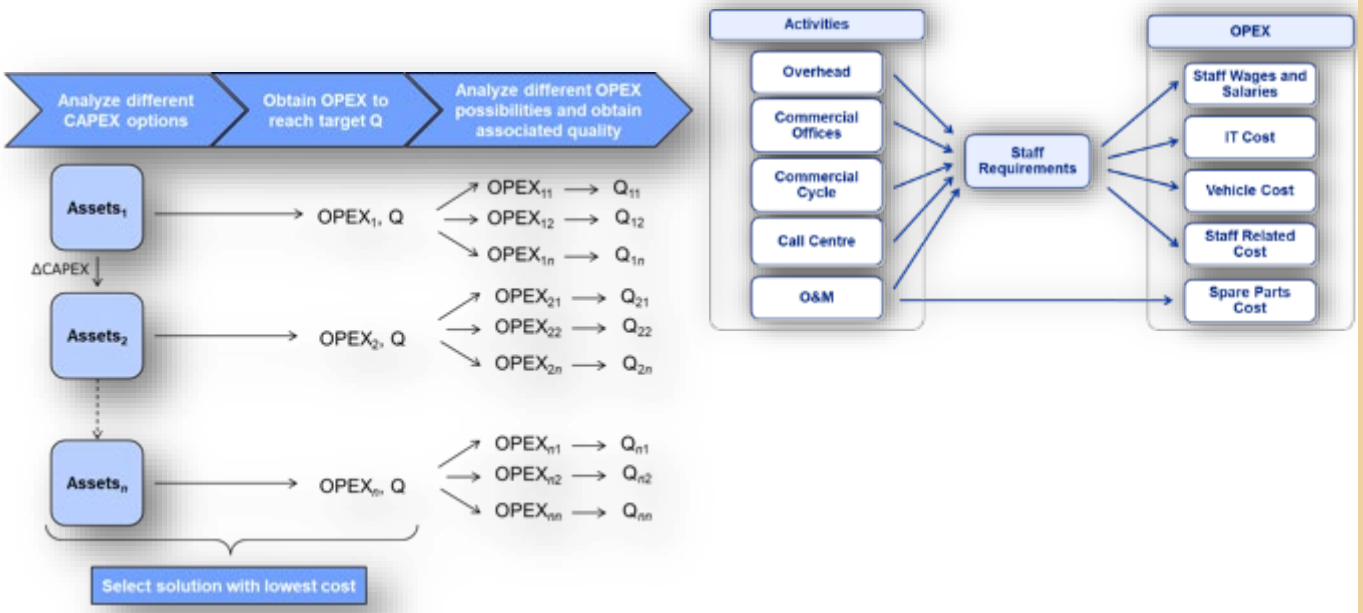


Mercados–Aries International.

MERUM







Overview

Merum is a software regulatory solution developed by Mercados – Aries International for the **optimization of investments and tariffs** in utilities.

It is based on a multi-parameter structure, which, considering utility parameters and boundary conditions, develops a series of algorithms and models to reach the **optimum OPEX** and **CAPEX** for best regulatory design.

Optimization is based on:

- Assets' characteristics (Grid age, Topology, level of automation, feeders' length, etc.)
- Historical information and investment patterns analysis
- OPEX based on staff calculations (benchmark, network conditions, number of customers, meters' reading, Call Centre, etc.)
- Boundary conditions: targets service level, losses, demand growth, etc.

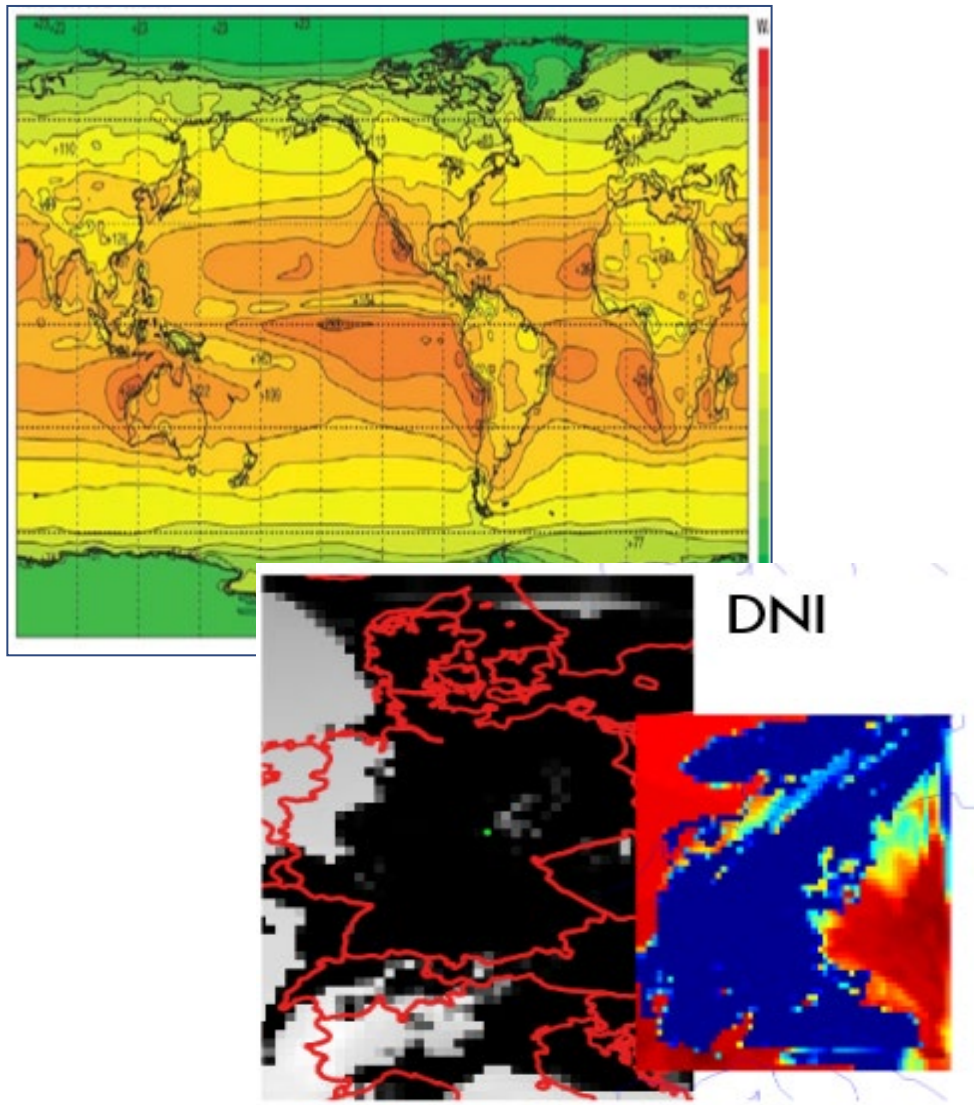
Considering the above, the program analyses the optimal tariff:

$$\text{Min}(Tariff(\$/kWh)) = \text{Min}\left(\frac{Revenue = f(CAPEX, OPEX)}{Demand(kWh)}\right)$$

Reaching the theoretical results for **tariff optimization**.

Mercados–Aries International.

SUNCASTER



Overview

SUNCASTER is a MAI in-house developed web solution that offers solar radiation and other weather variables data estimated from satellite images and reanalysis data set.

It takes into account temporal and spatial distribution, availability of representative time series, to estimate solar resource at locations where no previous ground historic radiometric records are available.

- Tested, being bankable for yield estimation
- Can generate time series for historic years
- Valid for PV (GHI) and CSP (DNI)
- Will be implemented in an online interactive platform to be used at low cost by the clients

Mercados–Aries International.

CORVUS

Corvus is a data intelligence solution developed by Mercados-Aries International for the **optimization of renewable energy mix that comprises batteries storage systems.**

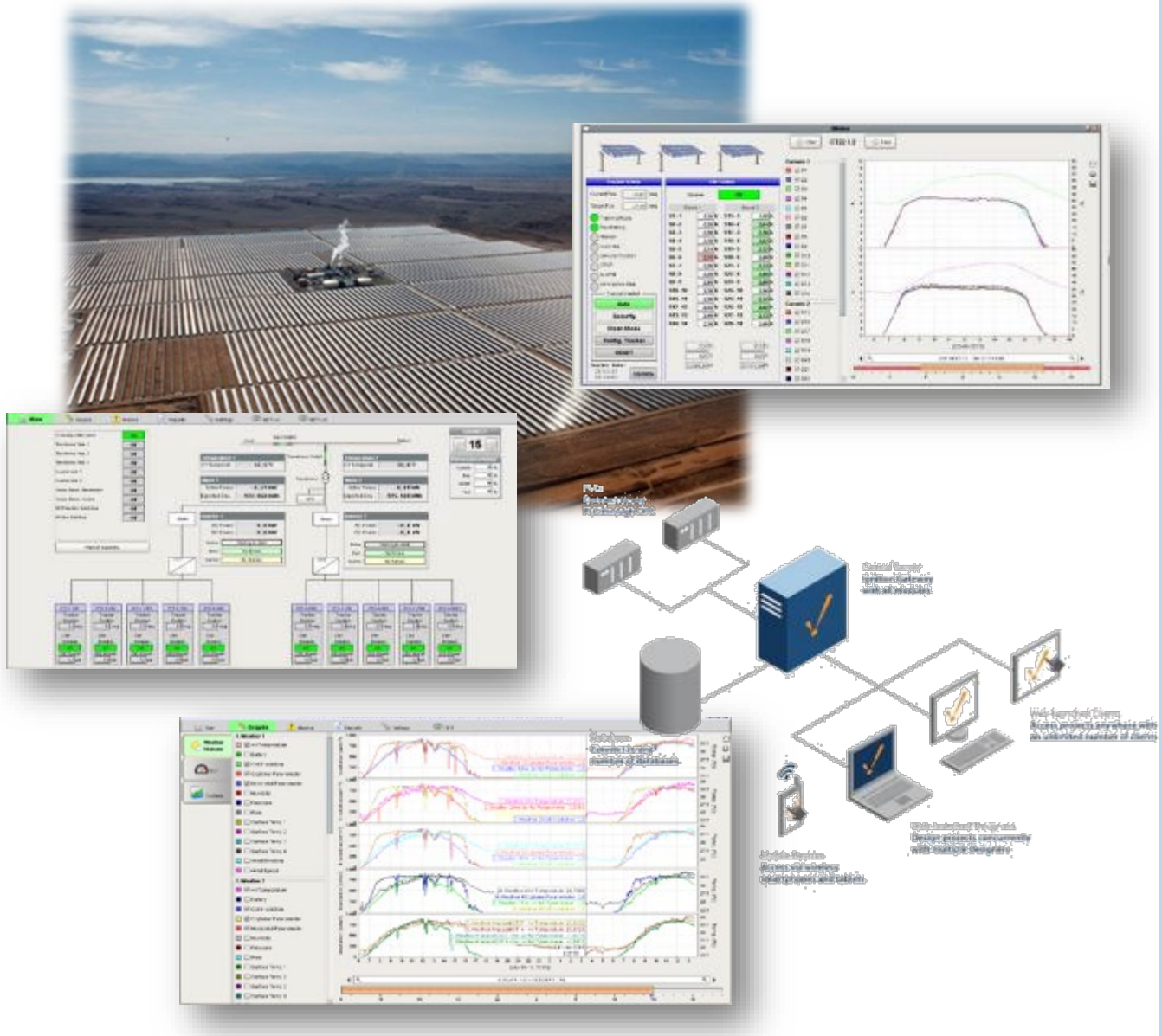
- The tool **simulates hybrid solutions**, capturing new opportunities along energy resources and BESS , and then **optimizes the energy mix**
- The software optimizes: 1. PV Power, 2. Wind Power, 3. BESS Capacity and 4. BESS Power.
- The Hybrid Facility Optimization tool is based on different **KPIs** such as **LCoE and firmess.** Besides, It generates heatmaps that depict the trend of the optimum solutions.
- Flexible to adapt to the client's needs by including additional constraints such as energy price profiles, PPA requirements, land requirements.
- It offers a clear understanding and outlook for different solutions, **optimizing the energy mix** and therefore **maximising profits**.



MAI has developed a software in Python/ Jupyter to simulate Hybrid solutions and optimizing the Energy Mixes. It allows to capture new business opportunities as well as maximising profits.



SCADA Solutions



Overview

Mercados – Aries International has a long experience in the design, implementation and operation of **SCADA systems** related to renewable energy monitorization.

They allow the organization of on-site data into different nested screens for remote monitoring and control of plants.

SCADA Systems present a detailed set of information that involves from general values to monitored values of single items, in a fully customizable and secure way.

Some successful implementations are:

- **GUATEMALA**: Repowering of *Horus I-II* 50+30 MW Solar Photovoltaic Plant, located in Chiquimulilla
- **TANZANIA**: *Kigoma* 5MW Solar Photovoltaic Plant
- **URUGUAY**: *El Naranjal* 50MW Solar Photovoltaic Plant, located in El Salto
- **BRAZIL**: *Agropoulo* 3MW Solar Photovoltaic Plant, located in Pindoretama

Relevant experience has also been acquired in **battery storage** SCADA control, with Projects like 20MW Solar PV Plant With Batteries Storage in Hawaii, involving the integration of Power Plant Controller (PPC) and BESS Controller in SCADA.

Mercados–Aries International.

Annex C
Some More References

We know about Energy (Power)



Tunisia: Réforme du secteur en Tunisie 'TUNEREP'.



Armenia: Full Transaction Advisory for PV Tender



Latin America: Energy Integration



Saudi Arabia: Review and evaluation of the Power Price Reform



Uzbekistan and Region: Technical Advisory for Large Renewables



Tanzania Rural Electrification Expansion Program (OE)



Nigeria: Capacity Building And Technical Assistance For The Nigerian Power Distribution Sector



Ukraine: Power Transmission Utility Sustainable Development



Spain, Central Asia and Africa: Owner's Engineering for RE Projects (Wind, PV, CSP, Battery, Lines)



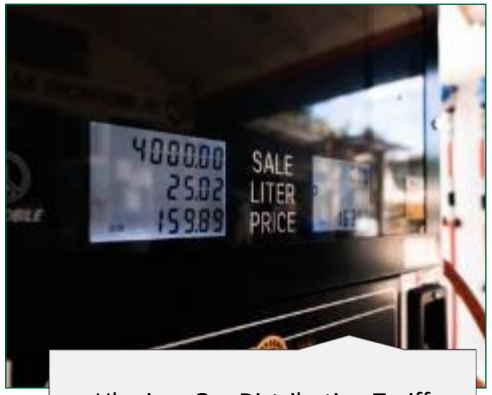
India: Capacity Building Program Distribution Sector

Mercados–Aries International.

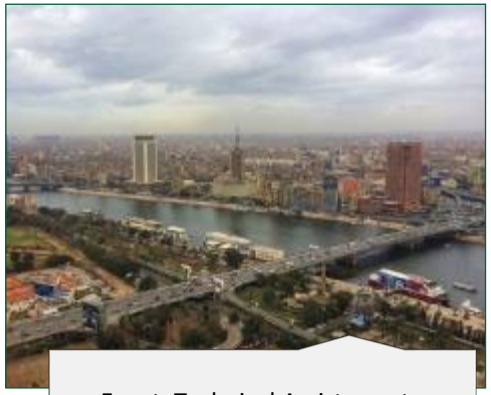
We know about Energy (Gas)



EU: Study on the role of gas storage in internal market and in ensuring security of supply



Ukraine: Gas Distribution Tariff Methodology Design



Egypt: Technical Assistance to Support the Gas Sector Reform



Jamaica: Development of a Legal and Regulatory Framework for the Gas Sector



EU: Study on regulatory incentives for investments in electricity and gas infrastructure projects



EU: Study on Tariff Design for Power & Gas Distribution Systems



Provision of technical and economic advisory services to EWURA's Natural Gas Division



India: Gas Trading Support

Mercados–Aries International.

We know about Water



Saudi Arabia: Review and evaluation of the Water Price Reform



Tajikistan: Micro Hydro for the remote areas' electricity supply in Pamir region



Gabon: Water and power tariff study



Pakistan: Micro Hydro Power Plants Development



Cape Verde: Technical Advisory for Brava Sustainable Island Project Formulation

Mercados–Aries International.