

WMO Portal for Weather and Climate Services for Energy



Roberta Boscolo
Climate and Energy Lead
World Meteorological Organization (WMO)

ICEM 2023, 27-29 June
Padova, Italy



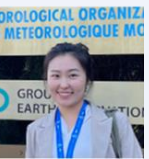
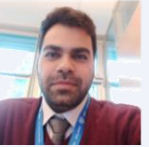
WMO Study Group on Integrated Energy Services (SG-ENE)



- 16 experts- all regions- different background
- Creating and sustaining an ongoing program of service delivery for the Energy sector, Especially renewable energies, support implementation of GFCS

WMO Energy and Climate (secretariat)

- Roberta Boscolo (Lead)
- Hamid Bastani
- Wu Richaihu



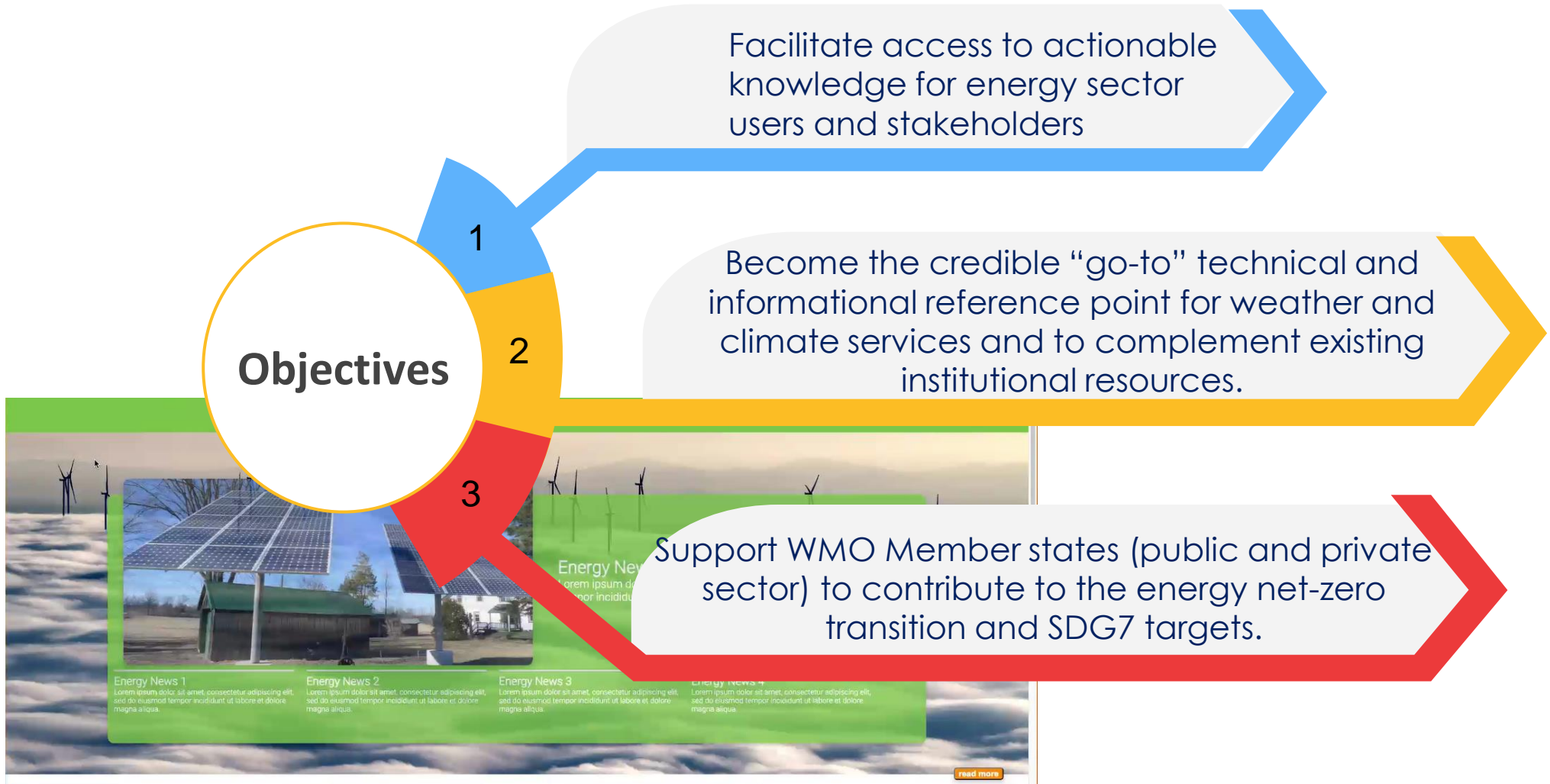
WEMC team

- Alberto Troccoli
- Beatriz Contreras
- Penny Boorman



Portal Objectives

The **WMO Portal for Weather and Climate Services for Energy** is part of a wide strategy to better serve societal needs in delivering authoritative, accessible, user-oriented and fit-for-purpose information and services. It contributes to the Global Framework for Climate Services (GFCS) aims to support policy-making and actions for sustainable development.



Portal main Functions

- provides a wide range of collected materials and documents to increase awareness and knowledge, cross-sectoral and geographical knowledge transfer



- Provides a global Climate and Energy Resilience Atlas with risk assessment indicators for Renewable sources

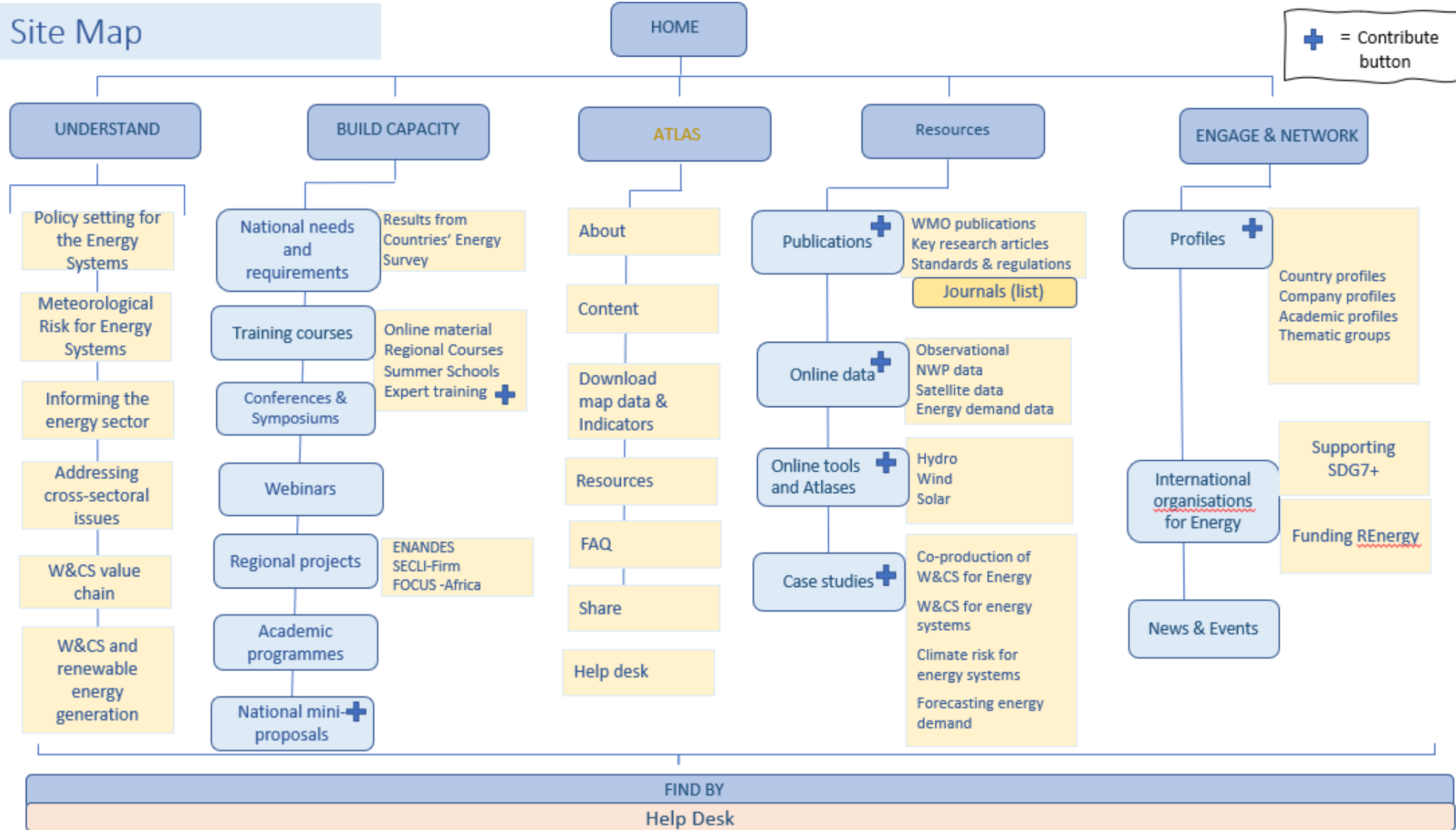


- Includes profiles for countries, companies, institutions and organizations to facilitate connecting requirements with existing solutions and foster collaborations

Mental Model



Portal Map



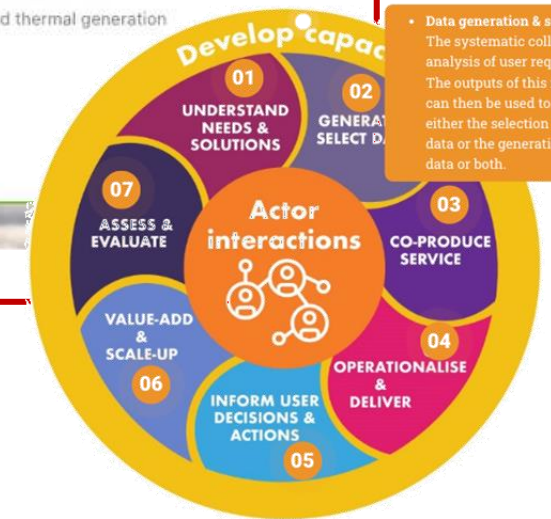
- Provides a good source of information on Weather and Climate Services for Energy

Portal Sections

Understand

The screenshot shows the WMO Energy and Meteorology portal. The 'Understand' section is highlighted and contains the following content:

- WHY DO WE NEED W&CS**
 - Policy settings for Net zero energy**
 - Energy transition
 - Energy Access
 - Energy Resilience
 - Energy Efficiency
 - The value of W&CS
 - Meteorological risk for Energy Systems**
 - Mechanisms of climate change
 - Effects of Climate change on energy systems
 - Disaster Risk Reduction and the Sendai Framework
 - Understanding risk
 - Strengthening disaster risk governance to manage disaster risk
 - Investing in disaster reduction for resilience
 - Preparing for risk. Weather readiness
- WHAT IS THE ROLE OF W&CS IN THE ENERGY SYSTEM?**
 - Informing in the Energy Sector**
 - Weather and Climate Services (What are they?)
 - W&CS for the energy system
 - Weather and climate forecasting for the energy sector from seconds to decades
 - The Flexibility of Smart Hybrids Grids
 - What are two-way smart hybrids grids
 - W&CS and smart hybrid grids
 - Adequacy Assessments
 - Addressing cross-sectoral issues**
 - Food-Energy-Water Nexus
- HOW DO W&CS WORK?**
 - W&CS value chain**
 - CO-CO-CO Co-design, Co-development, Co-evaluation
 - Data sharing, processing and management
 - W&CS and renewable energy generation**
 - W&CS forecasting for renewable energy
 - Solar and W&CS
 - Wind and W&CS
 - Hydro and W&CS
 - Nuclear and thermal generation



• **Data generation & selection** – The systematic collection and analysis of user requirements. The outputs of this initial phase can then be used to inform either the selection of available data or the generation of new data or both.

Portal Sections

Build Capacity

Resources

- **Build Capacity:** Provides a good source of training materials from previous courses, webinars, projects, conferences resources, etc.
- **Resources:** Provides a repository of useful tools and services, publications, case studies, etc.

The screenshot displays the WMO Energy and Climate Portal website. The main navigation bar includes 'Build Capacity', 'Global Risk Atlas', 'Engage & Network', and 'Resources'. The 'Build Capacity' dropdown menu is highlighted with a red box and contains the following items: Academic programmes, CB SumSch Reg.Cours Archives, Training course, **Projects** (highlighted with a mouse cursor), National needs and requirements, Webinars, Conferences and symposiums, Regional Projects, and National Mini-proposals. The main content area features a 'Project' section with a description: 'WMO Climate and Energy has a key role in a number of projects, in collaboration with international and regional partners, aiming to improve local capacity and generate materials and methods addressing the different needs of the participating countries.' Below this are three project cards: SECLI-FIRM, ENANDES, and FOCUS Africa. To the right, there are four callout boxes: 'Ongoing training' (Save the date!! (Future training)), 'Mini-proposals' (Publish calls for mini-proposals. Publish ongoing and completed mini-projects), 'Forthcoming conferences and webinars', and 'Help desk' (Request some training. Give feedback from past events. Submit information with dedicated formats).

Ongoing training
Save the date!!
(Future training)

Mini-proposals
Publish calls for mini-proposals.
Publish ongoing and completed mini-projects

Forthcoming conferences and webinars

Help desk
Request some training
Give feedback from past events.
Submit information with dedicated formats

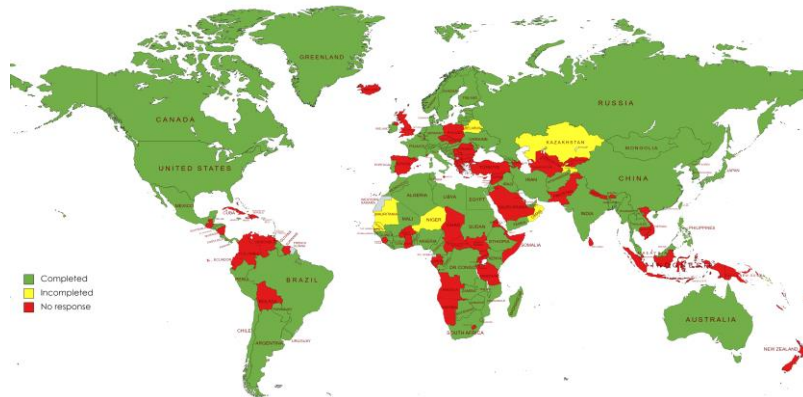
WMO Weather and Climate for Energy Capacity Development Plan- Components



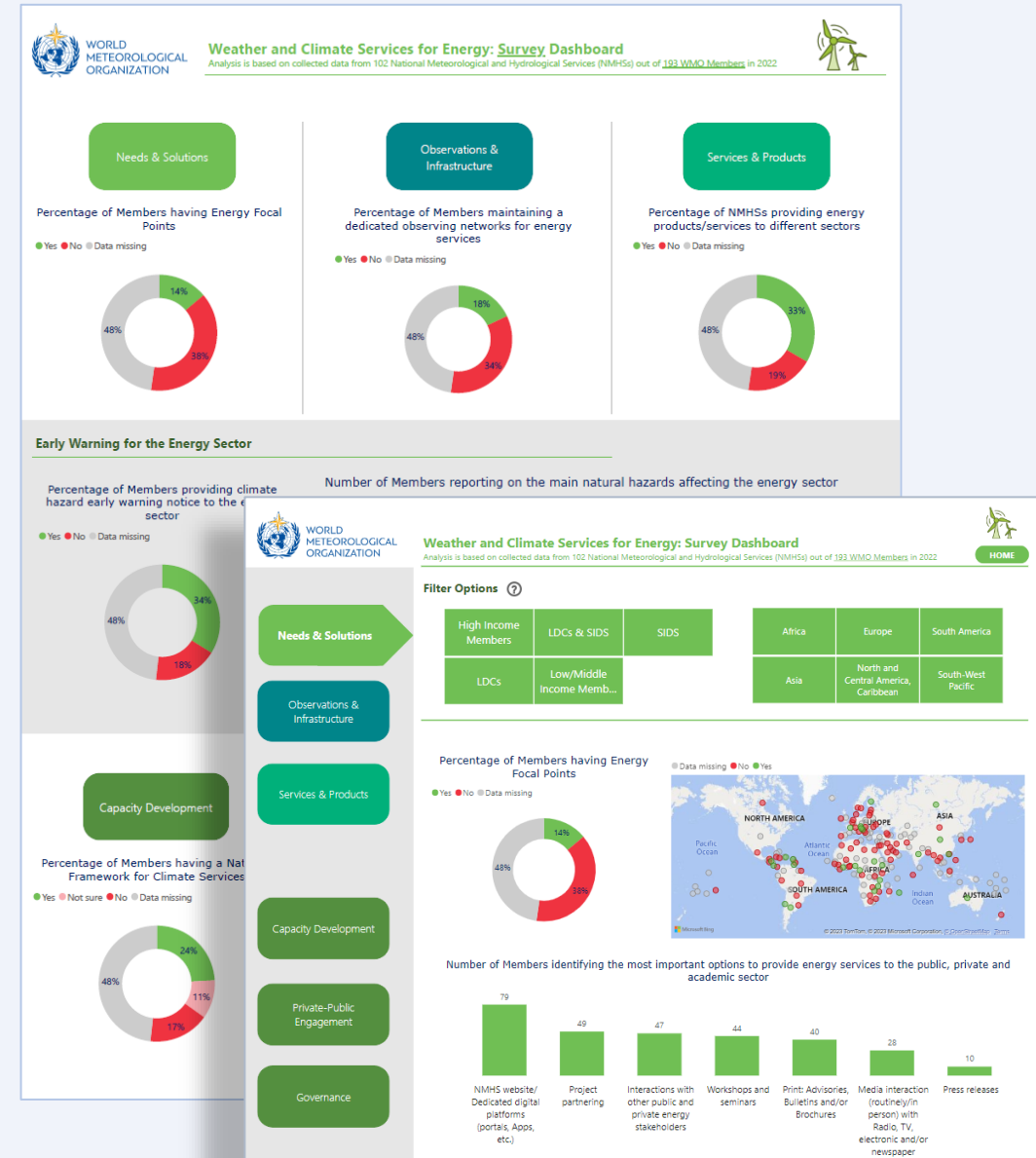
GAP Analysis (Surveys)

Energy Survey for Public Sector

- 1st WMO Energy survey for National Meteorological Hydrological Services Distributed in 2022.
- To identify global and regional gaps and needs in weather and climate services for the energy sector.
- 103/193 members completed the survey.
- The Dashboard showcases the survey results, including 1 landing page and 6 subpages, with 3 sections resounding the energy value chain.



Dashboard- Visualization of Results






New Survey for the Energy **Private Sector**

GAP Analysis (Surveys)

Designed by the SG-ENE targeting the energy private sector.

Objectives

-  To better understand the current state of energy business and weather and climate services practices for energy.
-  raise awareness of energy transition and energy resilience under climate change.
-  enhance the partnership between the private and public sectors.

Includes 3 sections with 36 questions.

S1. General information

S2. Weather and climate data and services for energy

S3. Climate resilience and sustainable energy

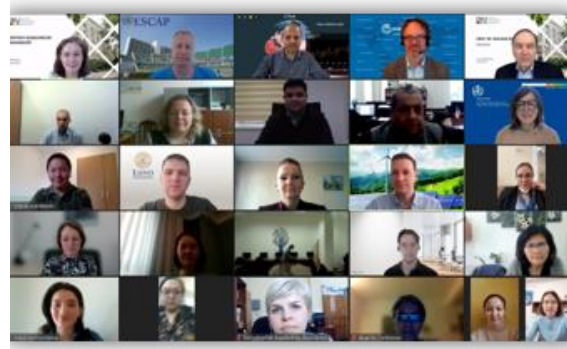
Please fill out the survey with the QR code below.

WMO SG-ENE Energy Survey for
the Energy Private Sector



Capacity Development Activities

Training Webinars Projects



Training course in Central Asia
Feb-March 2022

[Link to materials](#)



Summer School on Climate Services for Energy and Water

[Link to materials](#)



Example of webinars- COP26

[Link to the list of side-events](#)



Example of webinars- COP27

[Link to the list of side-events](#)



National Energy mini projects
Costa Rica and Chile

Nowcasting wind speed for wind power plants and evaporation model for hydropower



Regional Projects

[ENANDES project](#)
[FOCUS-Africa project](#)

Presentation by Hiba Omrani
Poster by Marcello Petitta

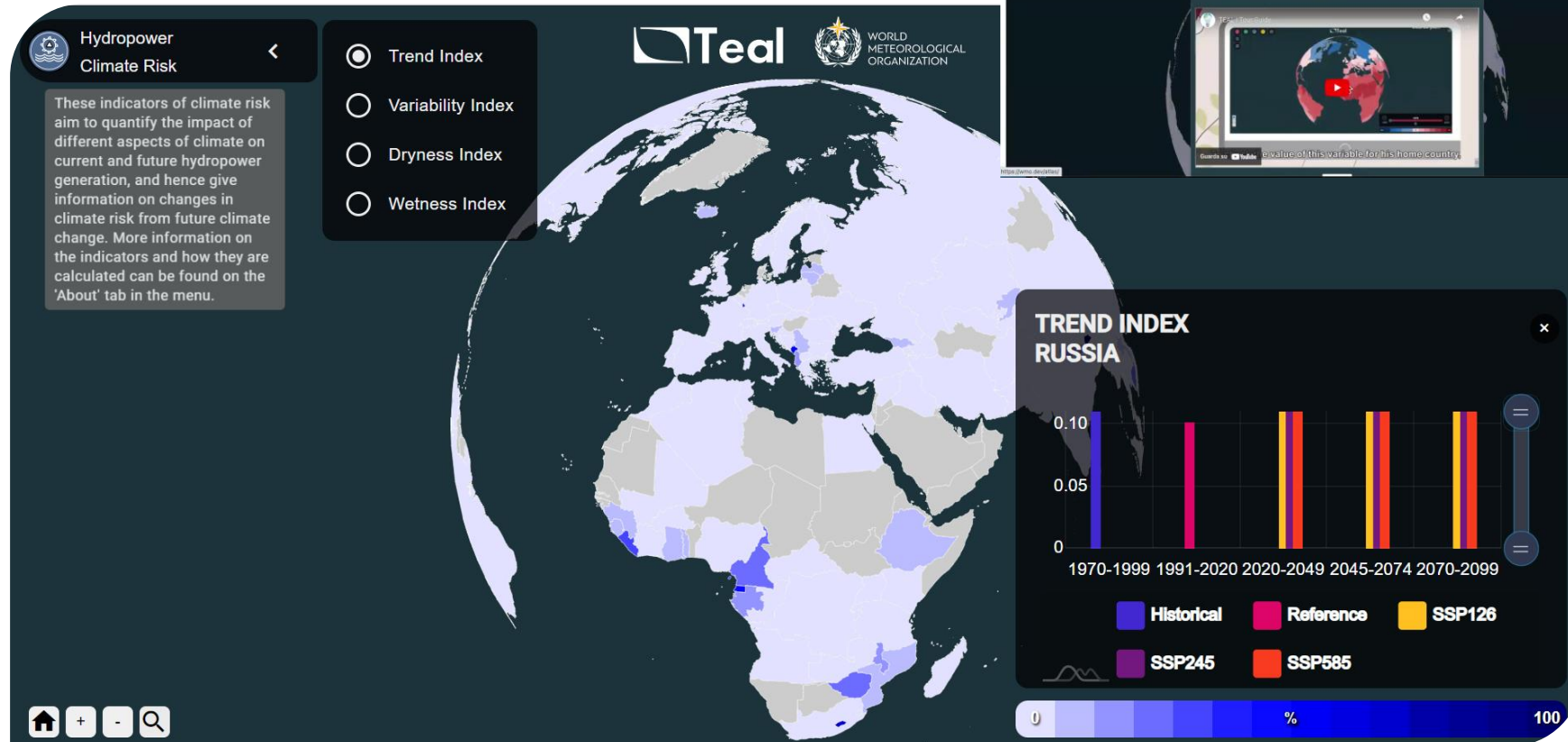
Portal Sections

Global Energy & Climate Resilience Atlas



- Provides climate risk indicators for hydropower (Solar and wind in the development phase)
- The final product will be globally available as an open-access interactive map to support long-term planning on renewables generation and increase energy security
- A scientific article based on the developed methodology is presenting at ICEM2023

Presentation by Richaihu Wu



➤ Provides a wide range of guidelines, publications and successful case studies, tools and datasets (development phase)

Portal Sections

Resources

Archives: Resources

Filter

Search

cost

Free (12)

Free & Pay (1)

Pay only (1)

Renewable technology

Hydro (13)

Solar (12)

Wind (12)

Energy Value Chain

Planning & Development (12)

Operation (3)


Energy Demand (2)

Financing (5)

Management & Planning (4)

Climate Risk (7)

Transmission & Distribution (1)




Earth H2O Observe

The earthH2Oobserve Water Cycle Integrator (WCI) allows you to view, manipulate and analyse Earth observation, in-situ and model data, it takes data that you select

[READ MORE »](#)

December 9, 2022




Flexidao

Our software helps companies reach net zero emissions by tracing where their electricity comes from and its true CO2 every hour of the day. We

[READ MORE »](#)

December 9, 2022

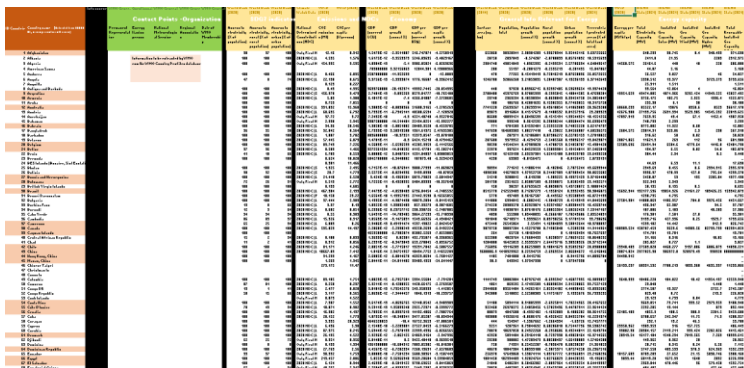


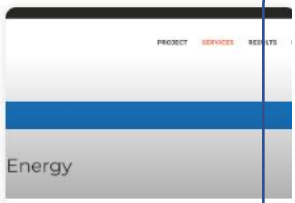
Carbon Monitor

The CarbonMonitor-Power is part of the international initiative CarbonMonitor which provides for the first time regularly updated, science-based estimates of daily CO2 emissions. Comparing year-to-year

[READ MORE »](#)

December 9, 2022





Energy

CLARA Toolkits

The aim of CLARA innovation

Publications

WMO Publications
Standards and regulations
International Agreements
Links to other key publications and books

On-line Tools and Atlases

Solar Atlas
Wind Atlas
ANTARES
HEAT
UKCIP
GE Storm Readiness
etc

Data Portal

Historical data
Real-time data
'Static data' (Plant locations, DEMs, etc).
Policies [db](#), etc

Case Studies

Co-production of W&CS for Energy
W&CS for energy systems
Climate risk for energy systems
Forecasting energy demand

Publications 58 entries

Online tools 14 entries

Data 48 data sets

Case studies 45 cases

UPCOMING



- **WMO-IRENA 2022 Year in Review: Renewable Resources Assessment**
- **To be launched at COP28 (December 2023)**
- Provide a broad, regular update to energy stakeholders on the role of climate and weather in modulating the renewable energy generation.
- Report on the state of renewable energy capacities in 2022, and comparison with an average of 30-40 years back. Assessment at the resources level
- Global and regional coverage for wind, solar and hydropower



Energy Exemplar
User Interface Plan
the Global Framework
Climate Services



Energy Exemplar,
2017
[Link](#)



2022 STATE OF
CLIMATE SERVICES
ENERGY

Integrated Weather and Climate Services
in Support of Net Zero Energy Transition

Best Practices from the WMO Commission for Weather,
Climate, Water and Related Environmental Services and
Applications

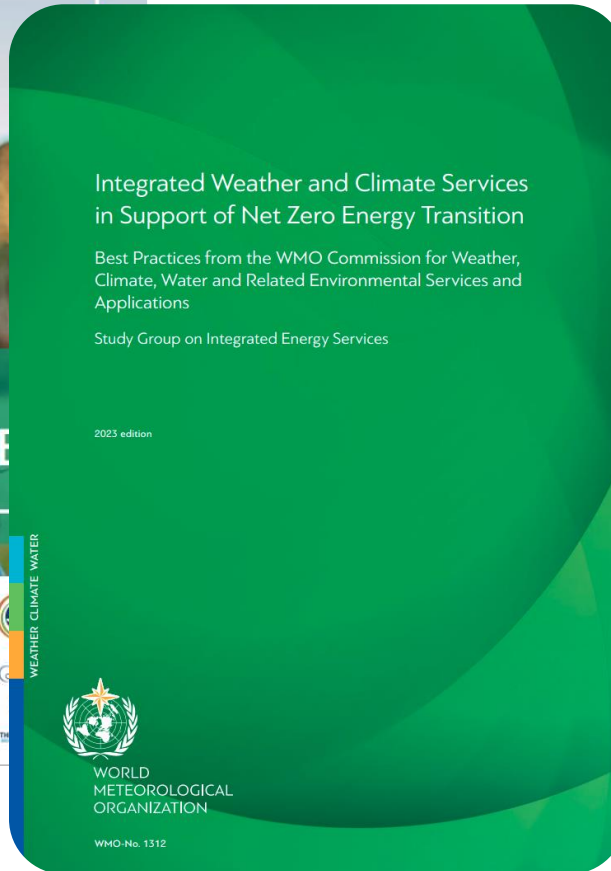
Study Group on Integrated Energy Services

2023 edition



2022 State of Climate Services:
Energy (WMO-No. 1301)

[Link](#)



WORLD
METEOROLOGICAL
ORGANIZATION

WMO-No. 1312

Integrated Weather and Climate Services
in Support of Net Zero Energy Transition
(WMO-No. 1312), 2023

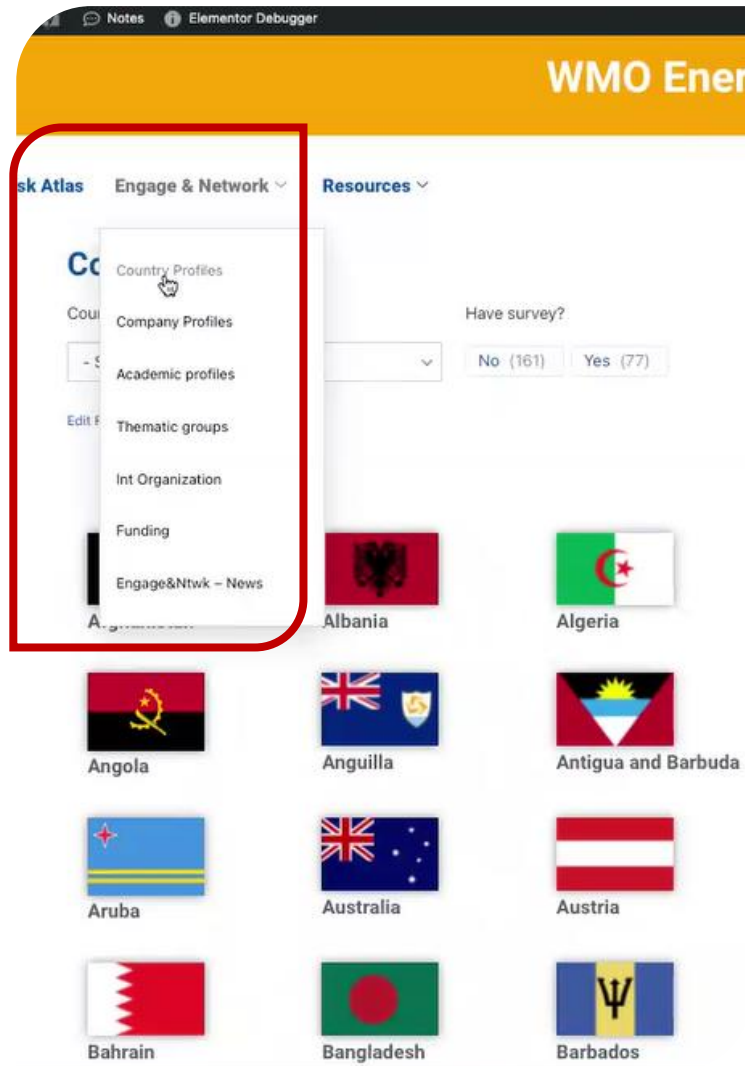
[Link](#)



Portal Sections

Connect & Network

- **Connect and Network is composed of profiles for countries, companies, international organizations and institutions**



So far

- 110 country profiles- data from WMO energy survey and IRENA
- 35 company profiles so 14 academic profiles- **Private sector attending ICEM2023 are encouraged to complete the WMO survey**
- 24 international organization profiles



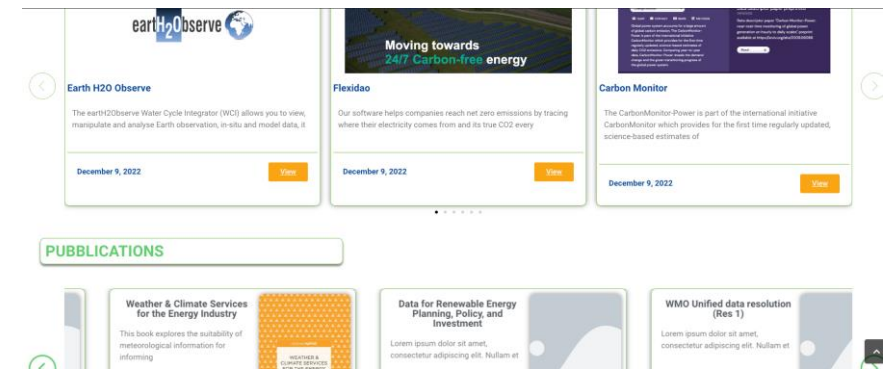
Netherlands

Survey? ✓

- Contact Points - Organization
- SDG7 indicators
- Emissions and NDCs
- Economy
- General Info Relevant for Energy
- Energy capacity

Emissions and NDCs

National Determined Contributions (NDC):	2020 NDC (Updated First NDC)
<i>Climate Watch Data</i>	
CO2 emissions (Mt): <i>OWID (2020)</i>	138.10
CO2 per capita (t/person): <i>OWID (2020)</i>	8.06



- Student projects to develop demonstration products

- COPs, events, publications

- Technical publication

- Energy resilience and Early warning for hydropower

Imperial College London

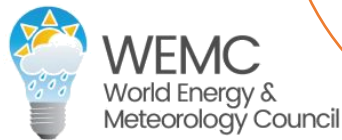


- Workshops and events



- Technical publications, events

- Energy resilience platform



- Events and webinars

- Global Climate and Energy resilience atlas and technical publications



- Events and webinars

- Data exchange and pilot-scale projects

- Exchange on data and tools

- Training courses and technical publications



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Find out more



Find by categories and key words.

See lists of categories for the different sections in the WMO Portal Main content word document and list of key words in the last page of WMO Portal content excel file

Find by location

Useful for finding

- Case studies
- Company profiles
- Research Institutes

