1ST EUROPEAN TEAMING CONFERENCE

WITH THE PARTICIPATION OF CENTERS OF EXCELLENCE (CoE)

CARE-C
CLIMATE AND ATMOSPHERE RESEARCH CENTER

THE CYPRUS INSTITUTE
RESEARCH•TECHNOLOGY•INNOVATION

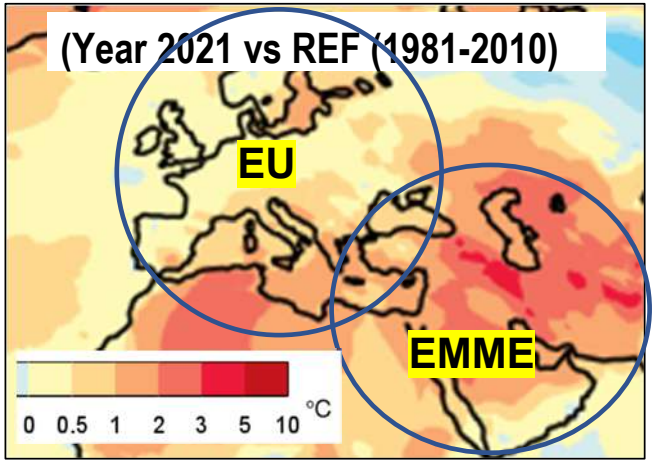
EMME-CARE
EASTERN MEDITERRANEAN MIDDLE EAST – CLIMATE & ATMOSPHERE RESEARCH CENTRE

Prof. Jean SCIARE, CARE-C CoE Director
EMME-CARE Teaming Coordinator

DEPUTY MINISTRY OF RESEARCH, INNOVATION AND DIGITAL POLICY
REPUBLIC OF CYPRUS

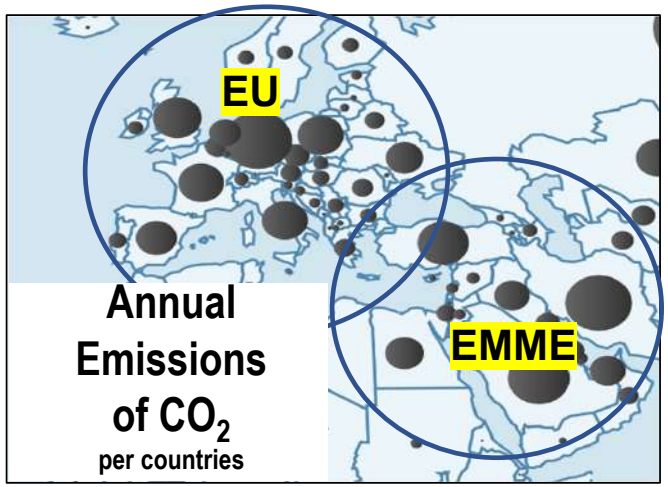
CHALLENGES (1/3)

Temperature Anomalies



https://public.wmo.int/en/media/press-release/state-of-climate-2021-extreme-events-and-major-impacts

Greenhouse Gases Emissions

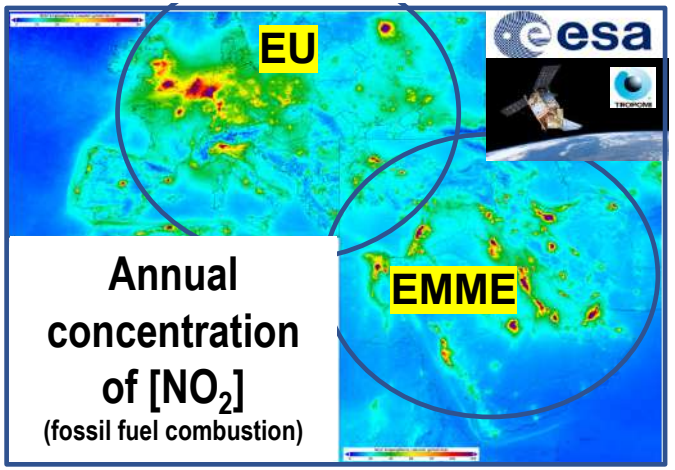


http://www.globalcarbonatlas.org/en/CO2-emissions

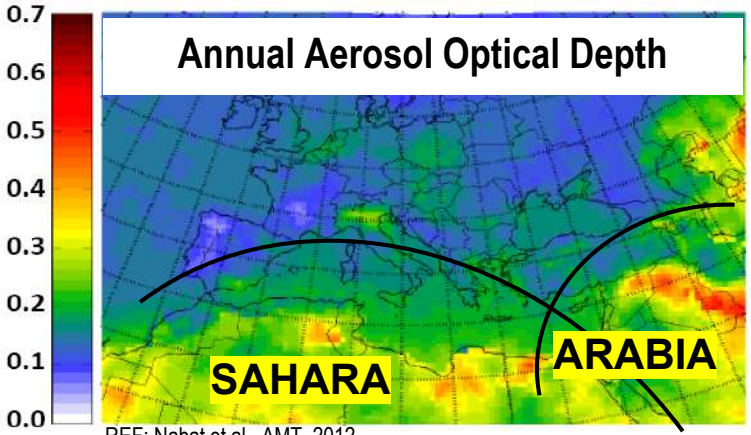
The **E**ast **M**ed. & **M**iddle **E**ast (**EMME**) region is a

Hotspot
for
Climate Change
&
Air pollution

Human-made Air Pollution



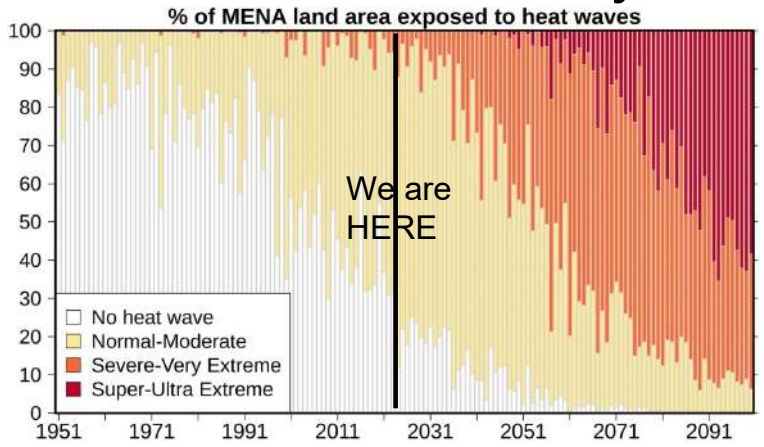
Desert Dust Air Pollution



REF: Nabat et al., AMT, 2012

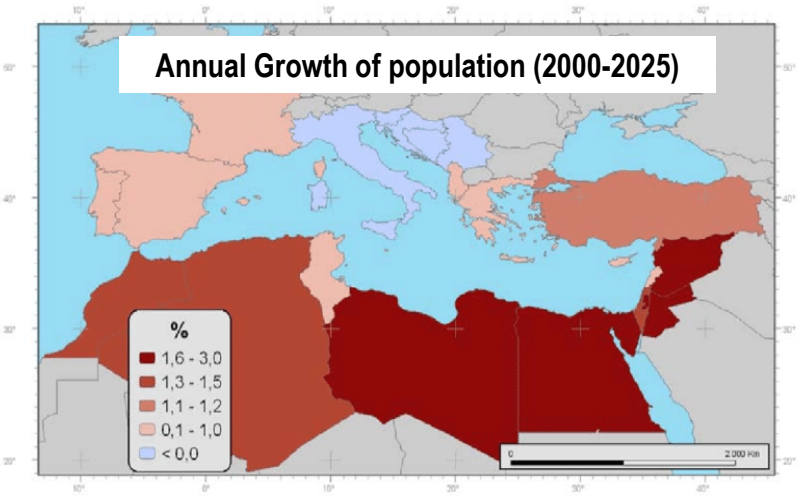
CHALLENGES (2/3)

Heat waves will intensify



Source: Zittis et al. (2021b)

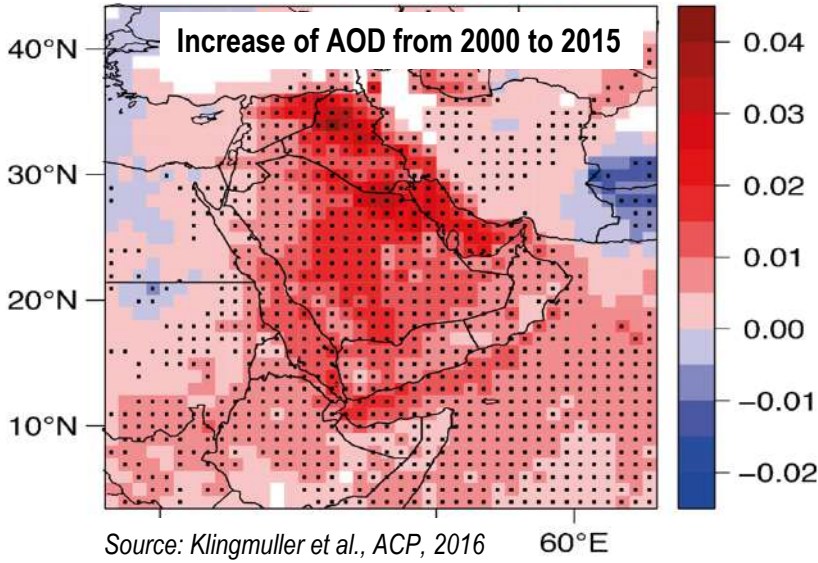
Population will grow rapidly



Source: UN, 2005

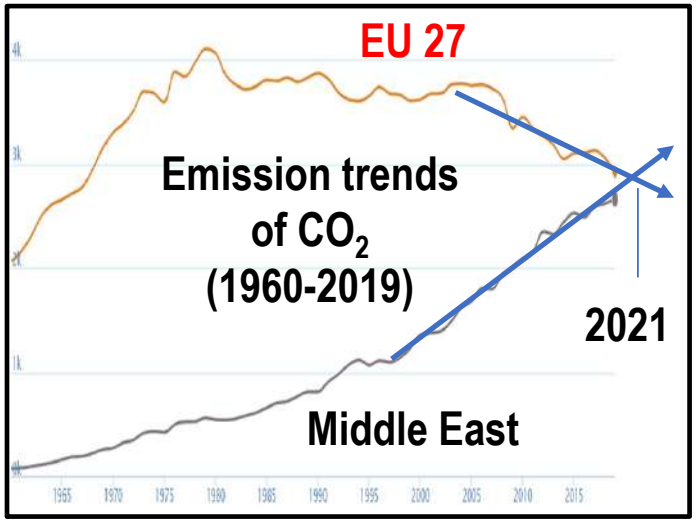
The current regional situation will get **worse**

Dust emissions will increase



Source: Klingmuller et al., ACP, 2016

GHG emissions will go higher



http://www.globalcarbonatlas.org/en/CO2-emissions

CHALLENGES (3/3)

Health

With major regional **socio-economic impacts**

Water resources

Ecosystem Agriculture

Renewable Energy

Possibly leading to massive “climate migrations” (in Europe) with regional socio-political instabilities and conflicts

CARE-C
CLIMATE AND ATMOSPHERE RESEARCH CENTER

4 Research Departments

OBSERVATIONS
Atmospheric composition:
Emissions
Distribution
Trends

PREDICTIONS
Climate system processes
Numerical models
feedbacks

REGIONAL IMPACTS
Public health
Economic sectors
Societal resilience

Fill the gap of **OBSERVATIONS** ...

For a better **PREDICTION** ...

of the **REGIONAL IMPACTS** to enhance resilience

PROFILE

THE CYPRUS INSTITUTE

CARE-C
CLIMATE AND ATMOSPHERE RESEARCH CENTER

Established in Jan. 2020
(4th Research Center of the Cyl)

103 staff
17 different nationalities
50% non Cypriot
1/3 Cypriots repatriated

9 Faculty
2 Prof. in the top 2% world scientists Geoscience

21 PhD students
9 different nationalities
8 Joint PhDs with EU univ.

3 Advanced Partners
(Finland, France, Germany)
(UHEL, CEA, MPIC)

1,500m²
Infrastructure

5 Research Labs
(22 tech. experts)

3 Spin-off companies

18 Ongoing Research Projects (1 ERC, 4 H2020, 1 HE, 2 ESA, 1 LIFE, …)

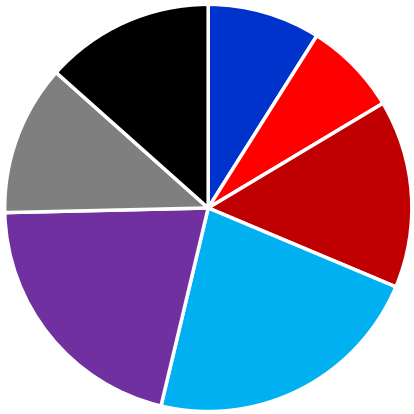
>2 M€ of revenues/year
(>500k from products/services)

>100 peer-review publications / year
(**40% in top 10 journals**)

AREAS OF EXPERTISE

Scientific Expertise

Publications (Year 2020)



- Meteorology (6)
- Climate Change impact (5)
- Climate Change science (10)
- Atmospheric Modelling (15)
- Atmospheric Measurements (14)
- Aerosol Technology (8)
- Air Pollution Health Impact (9)

Technical Expertise

Research Facilities

- Environmental Chemical Analyses
- Air Quality Monitoring
- Unmanned Aerial Systems
- Environmental sensors
- Nanotechnology
- Data science
- Computer modeling

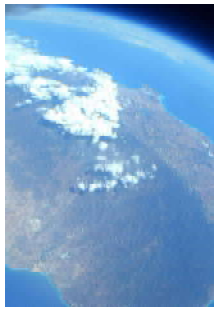
MAIN EXPERIMENTAL ACTIVITIES (1/2)

Long-term **atmospheric observations**

Contributing to international networks

Cyprus Atmospheric Observatory

ACTRIS Aerosols, Clouds and Trace gases Research Infrastructure
ESFRI
emep
NASA
AERONET AEROSOL ROBOTIC NETWORK
WORLD METEOROLOGICAL ORGANIZATION
GLOBAL ATMOSPHERE WATCH
TCCON total carbon column observing network



High Quality **Environmental Chemical Analyses**

Sunset Lab OC-EC

Thermo ICS 5000

Thermo IC-PAD

Agilent ICP-MS

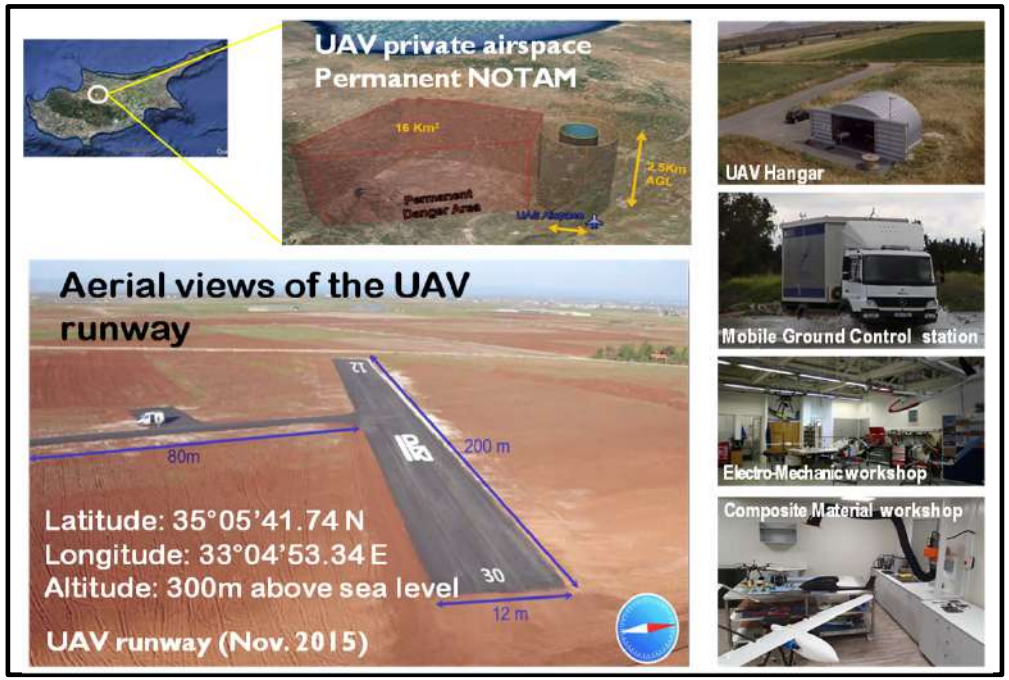
Agilent GC-MS

MAIN EXPERIMENTAL ACTIVITIES (2/2)

Development of **Unmanned Aerial Systems** (UAS)

UNMANNED SYSTEMS RESEARCH LABORATORY

EASA European Aviation Safety Agency



COLLABORATIONS (1/2)

Engaging **local ecosystem** to enhance **impacts**

Cyprus University of Technology
FREDERICK UNIVERSITY
University of Cyprus
European University Cyprus
CYENS CENTRE OF EXCELLENCE
EXCELSIOR

Academia and 'Teaming' CoEs

Research Projects
Publications

Dissemination
Networking

Associations NGOs

OEB
CYPRUS CHAMBER OF COMMERCE AND INDUSTRY

Innovation Projects
Services, Access to R.I.

Private Stakeholders

exness
VASSILIKO CEMENT SINCE 1963

Staff affiliation, Education, Training

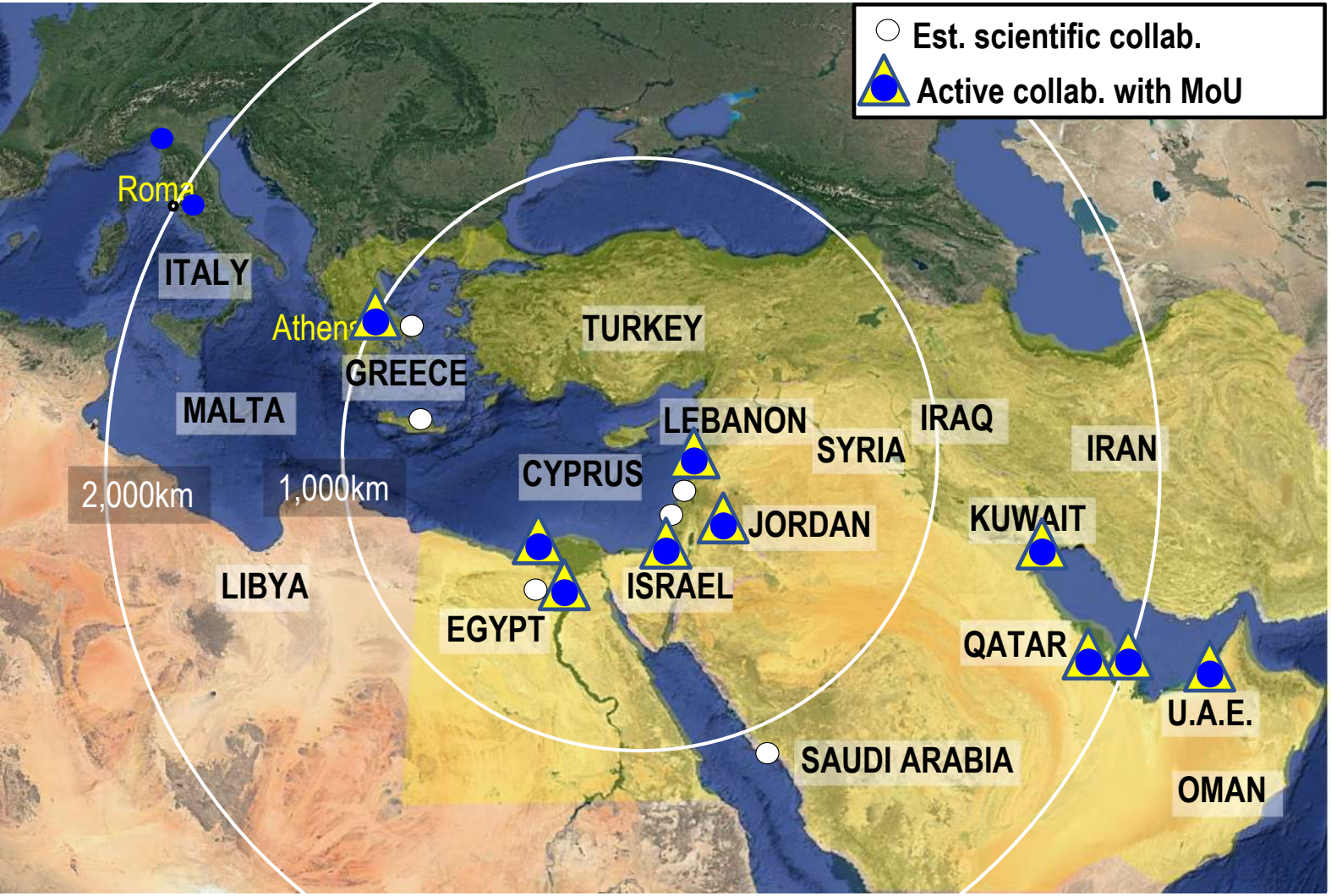
Services, MoUs, Implementation of National Action Plans, Policy consultancy

Government Departments of the Republic of Cyprus

DEPARTMENT OF ENVIRONMENT
CYPRUS DEPARTMENT OF METEOROLOGY
ΤΜΗΜΑ ΔΑΣΩΝ DEPARTMENT OF FORESTS
Nicosia General Hospital
ΠΟΛΙΤΙΚΗ ΑΜΥΝΑ ΚΥΠΡΟΥ

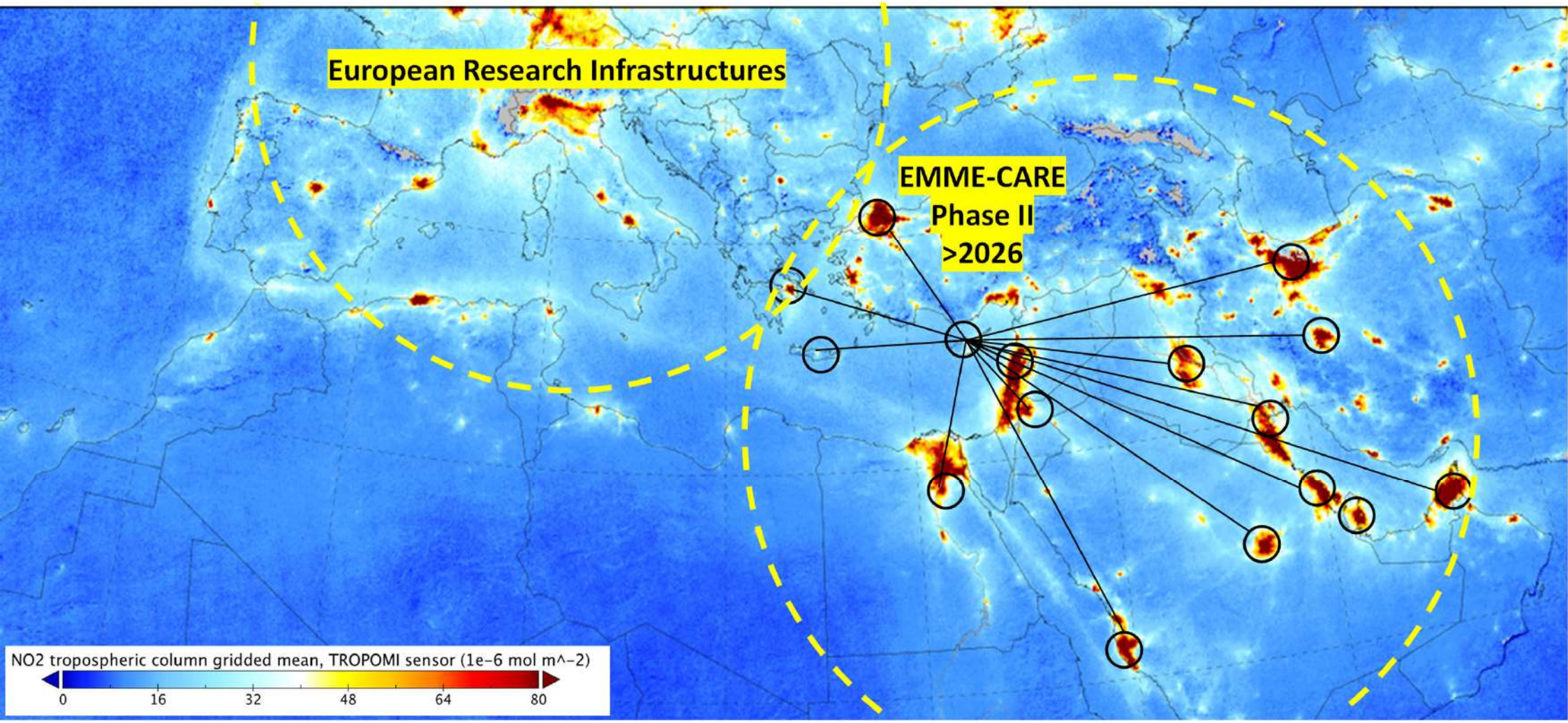
COLLABORATIONS (2/2)

Developing **Regional Networks** to enhance **visibility/opportunities**



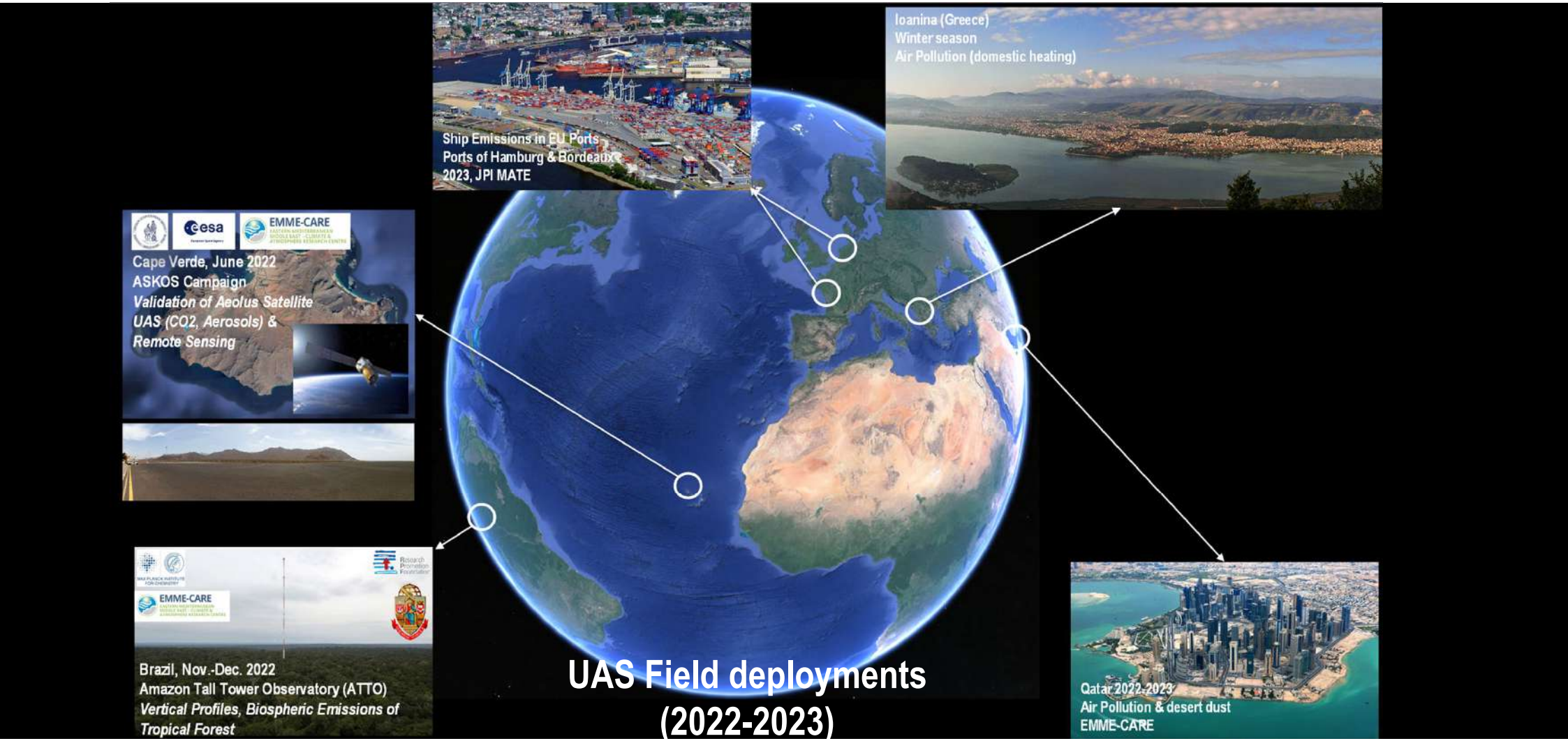
FUTURE DEVELOPMENT PLANS (1/3)

Enhancing regional observations and better connect them with EU R.I.



FUTURE DEVELOPMENT PLANS (2/3)

Join **international initiatives** to better **monitor Climate active species**



FUTURE DEVELOPMENT PLANS (3/3)

Develop **new Environmental products/services** to better sustain the CoE

Atmospheric sensors

Optical Particle(dust) Counter

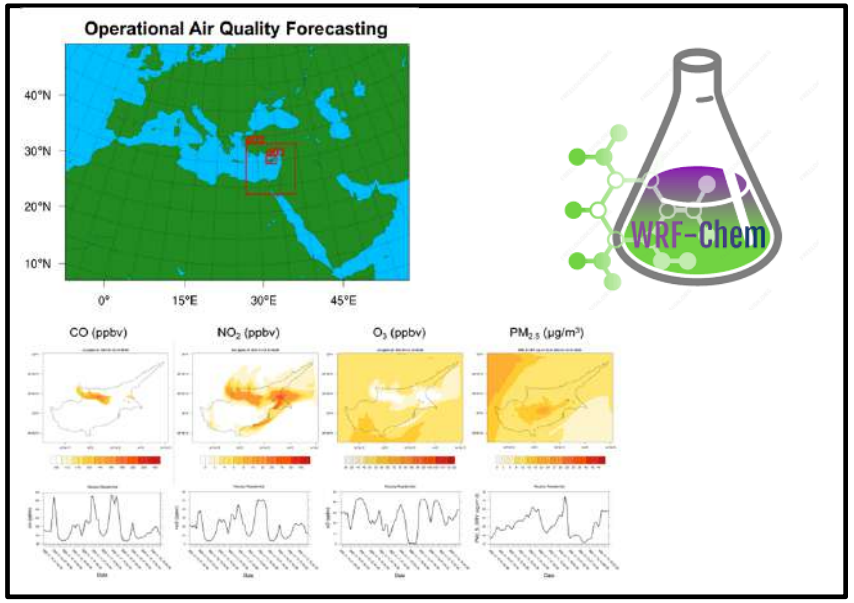
Low-cost air quality monitor

Drones for the Environment

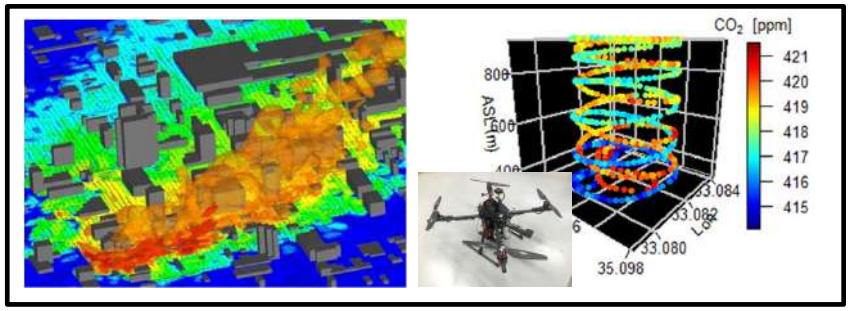
Hardware/Firmware

Software

Air Pollution forecasting tools



Emission control & leak detection



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THANK YOU