

# Experiences and Practices towards the Adoption of Innovation

## Cyl: Addressing the Climate Challenge

Costas N. Papanicolas, The Cyprus Institute



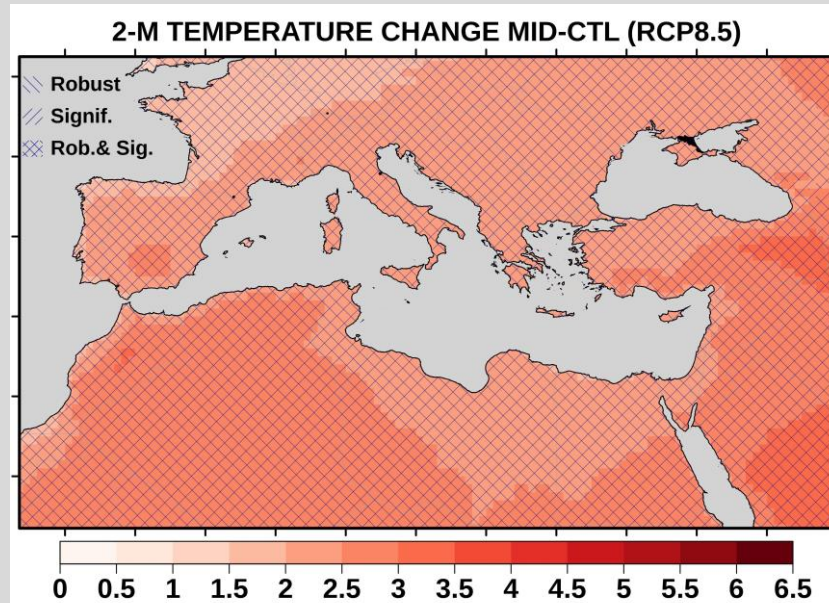
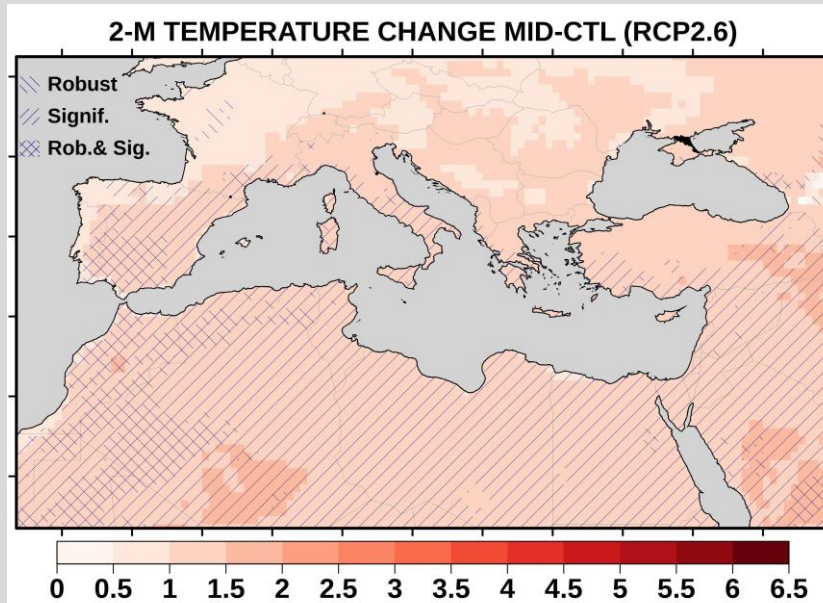
# Temperature changes (relative to 1986-2005)

Zittis G., Hadjinicolaou P., Lelieveld J., Klangidou M., Proestos Y. (2018)

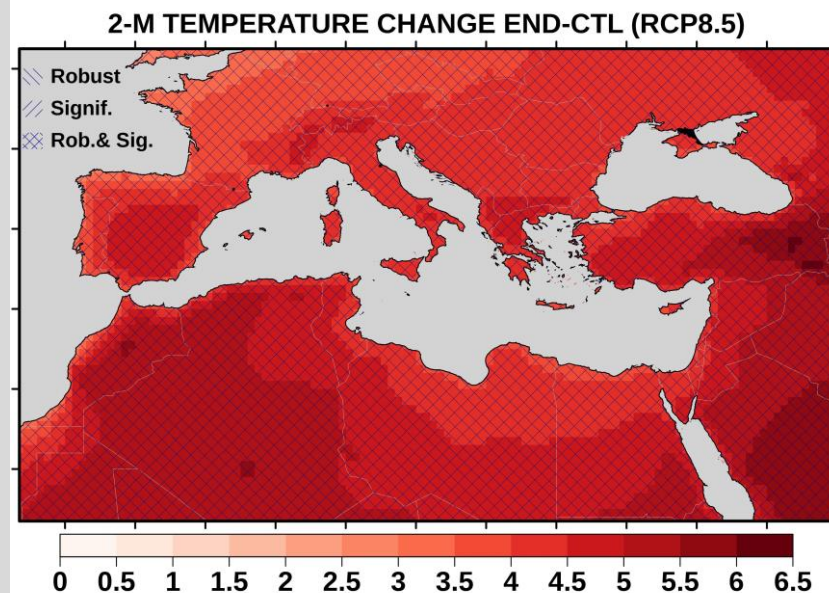
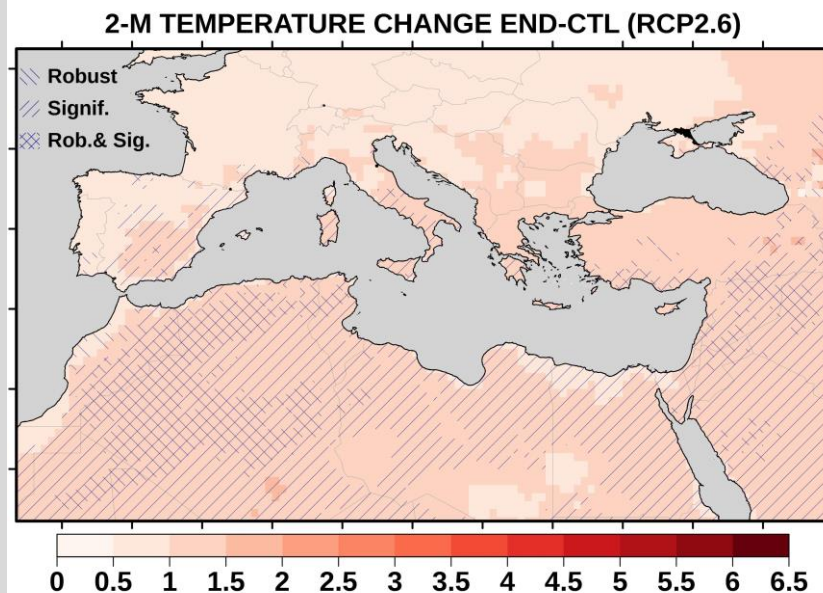
**RCP2.6**

**RCP8.5**

**MID  
21<sup>st</sup>**



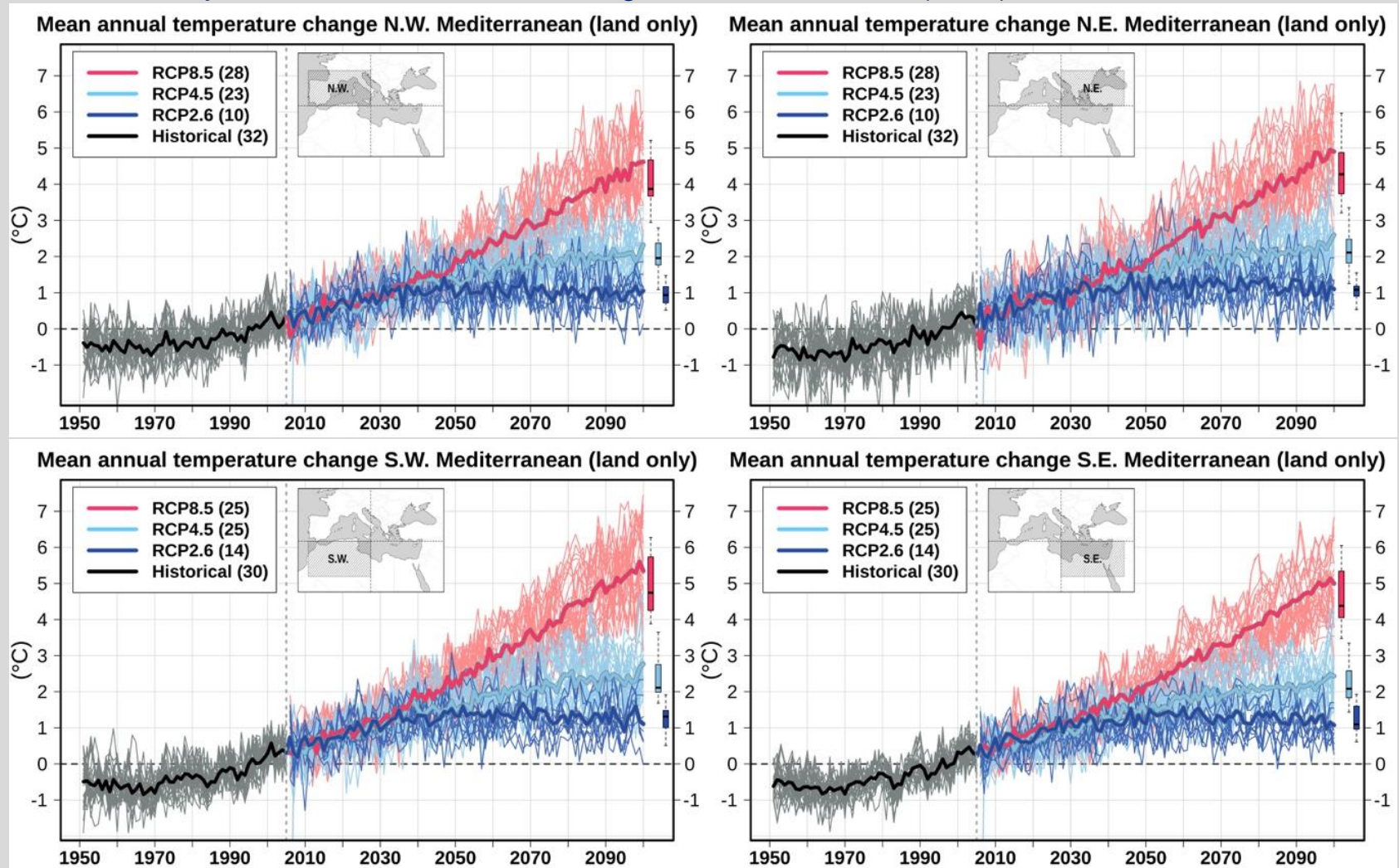
**END  
21<sup>st</sup>**



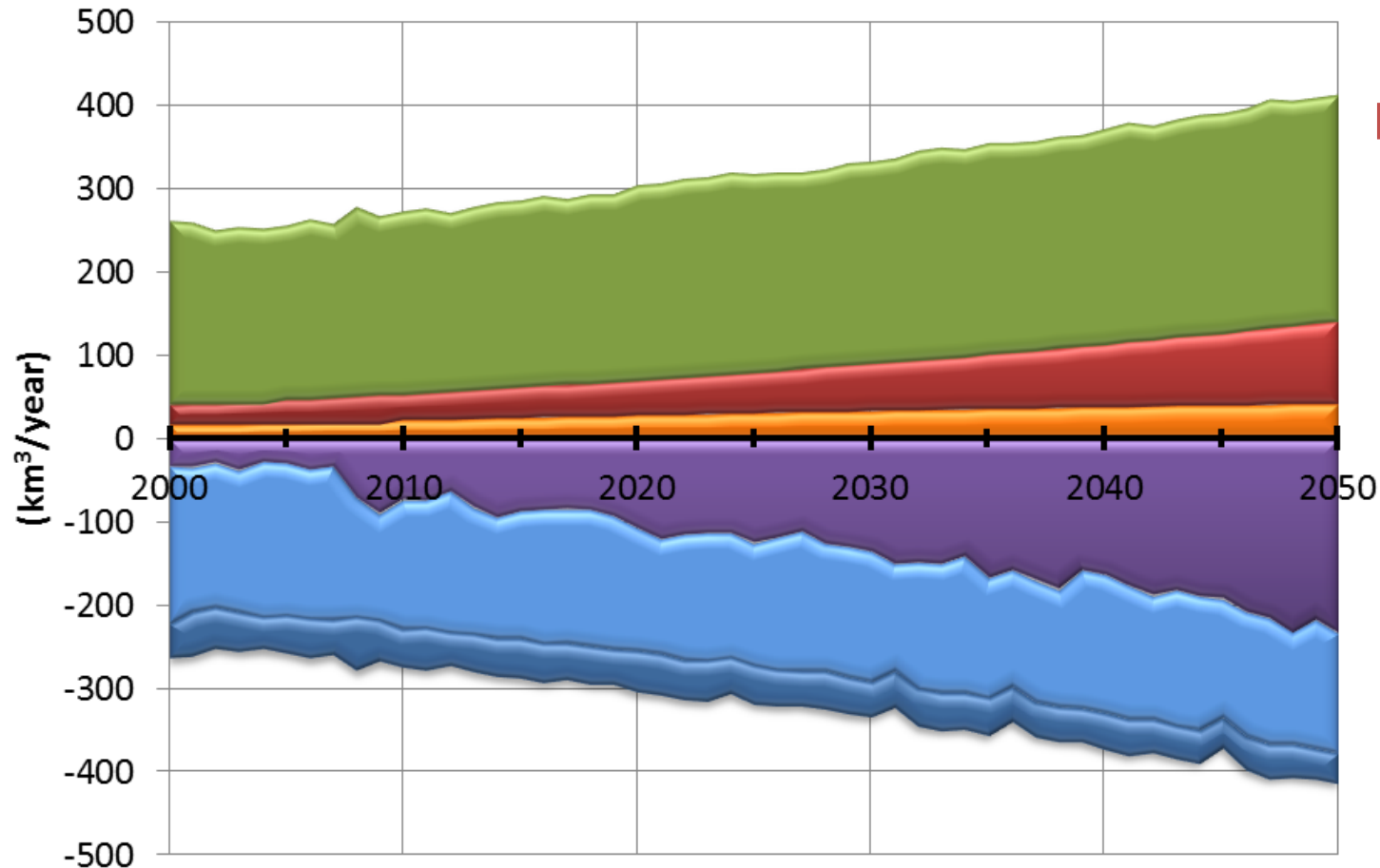


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# Water Budget for the MENA Region in the light of Climate Change



Refer: M. Scoulos

World Bank

# Cyprus Institute: Modeling of City Temperatures

Number of hot days per year ( $T_{\max} > 35^{\circ}\text{C}$ )

	Recent	End century	Change
Ankara	10	50	x 5
Athens	29	52	+ 80%
Bahrain	105	161	+ 50%
Beirut	7	57	x 8
Cairo	116	163	+ 40%
Istanbul	8	56	x 6
Nicosia	57	110	x 2

# The Challenge

**Almost all climate models predict that the EMME region will be affected very adversely by climate change:**

- Extreme weather (principally heat waves)
- Shortage of Water
- Shortage of electricity
- Health risk factors
- Agriculture, Tourism industry at risk
- Economic collapse??
- Security; Mass Migration

**What can we do about it?**



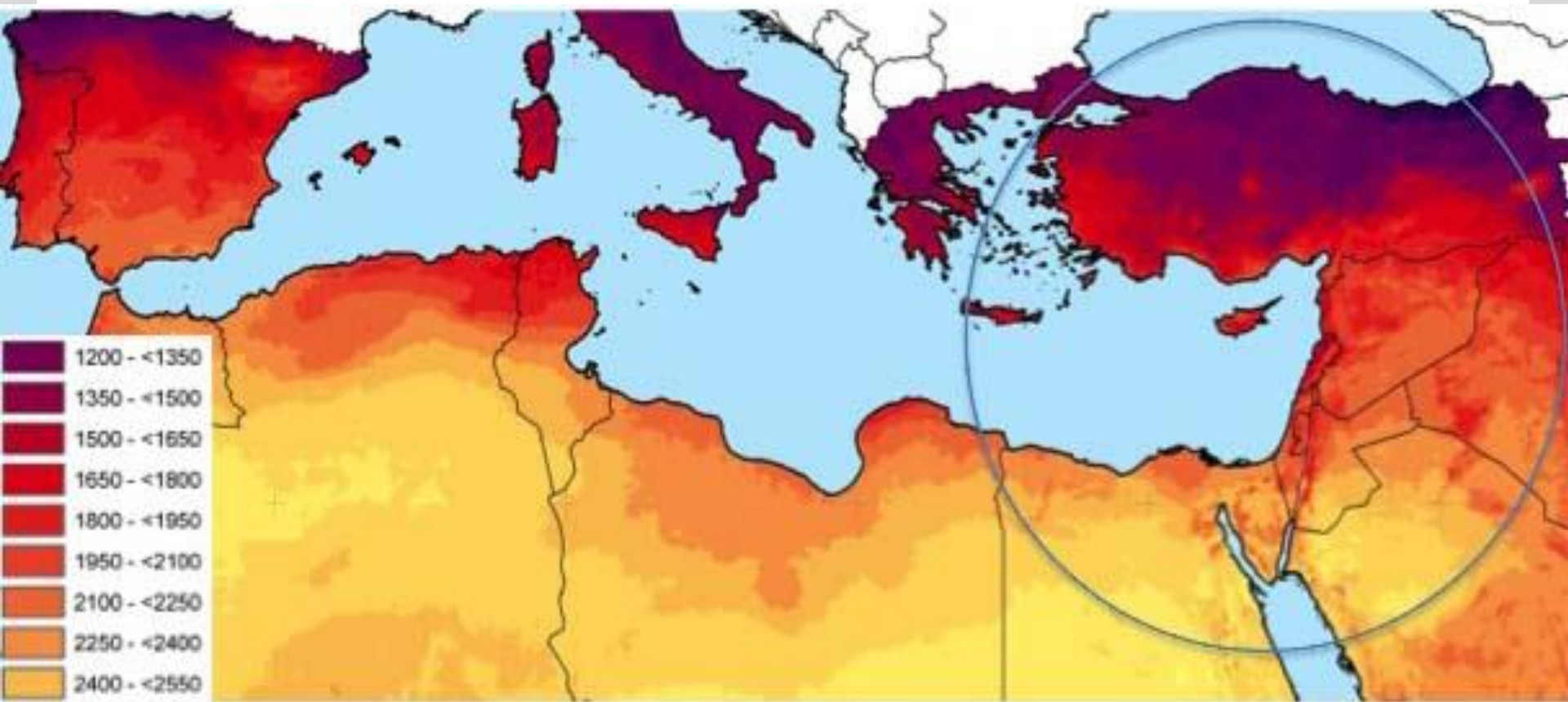
# Adaptation; Amelioration of Impacts

**We have a reasonable understanding of the challenges**

- **We do have the technology to partially address them**
- **Even the market forces are in the right direction, the pace is slow: time scale mismatch!**
- **Political will and politics stand in the way.**



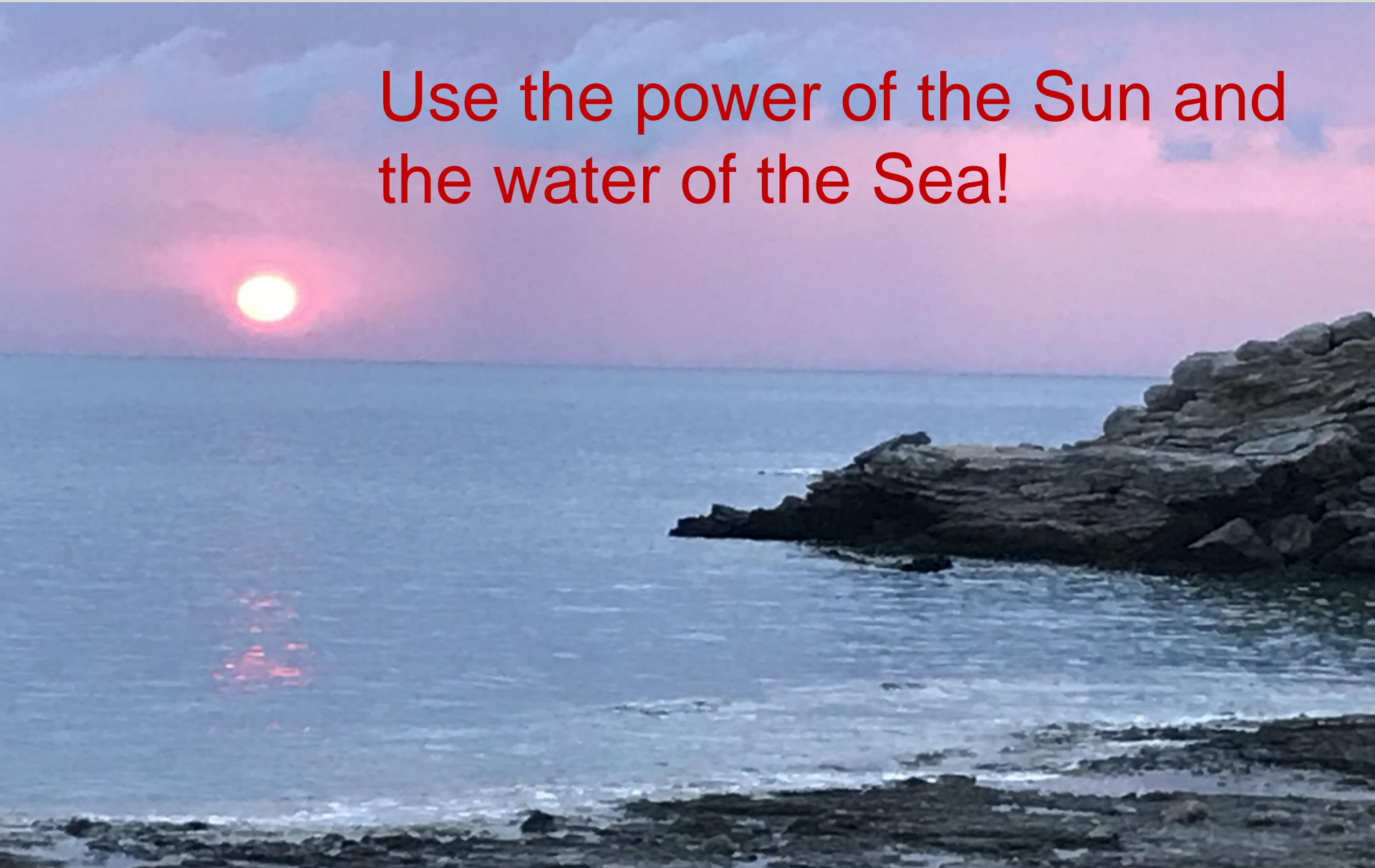
# Areas most suitable for Solar Energy



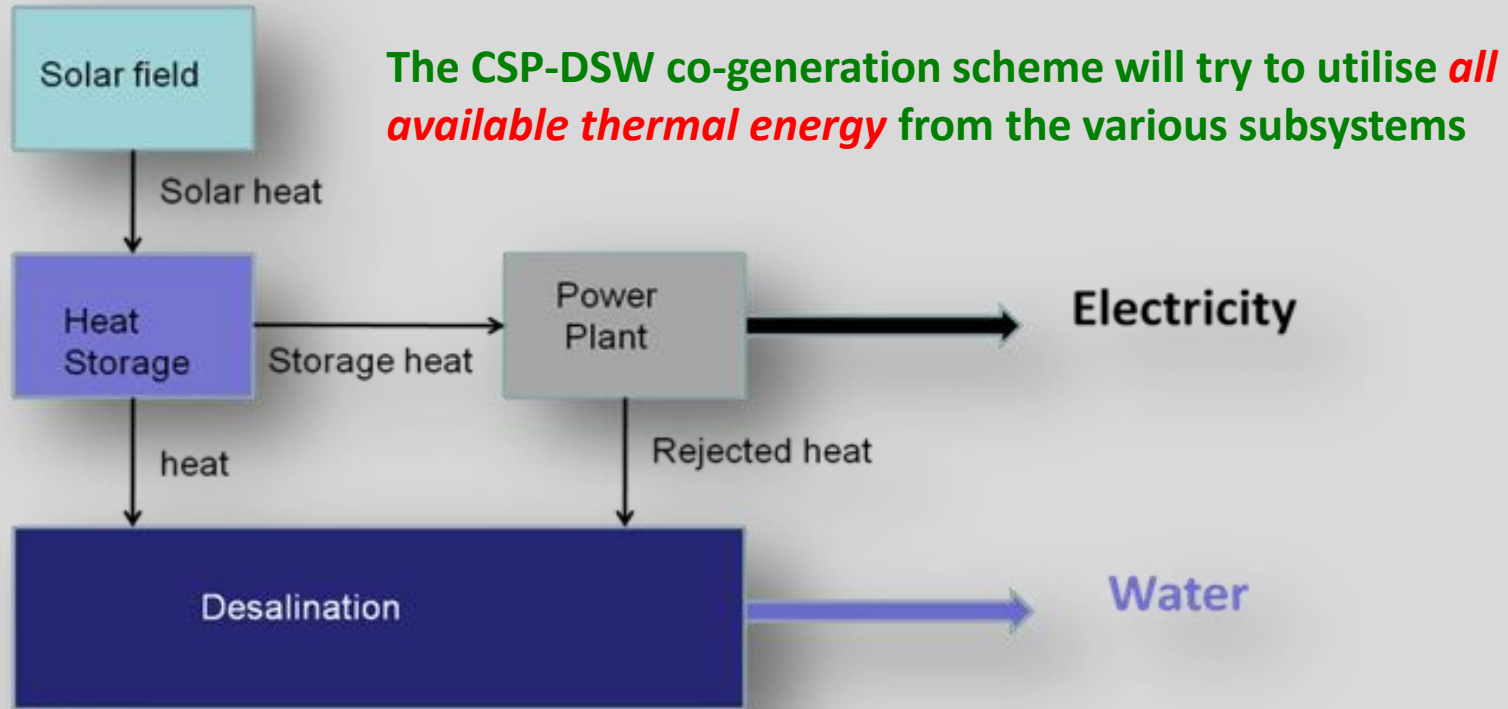


How do we adopt for the shortage of water?  
and of electricity? Process heat?

Use the power of the Sun and  
the water of the Sea!



# CSP-DSW Co-generation concept



The advantages of CSP-DSW are realized only when the power and desalination cycles are *integrated thermally and optimised* together.

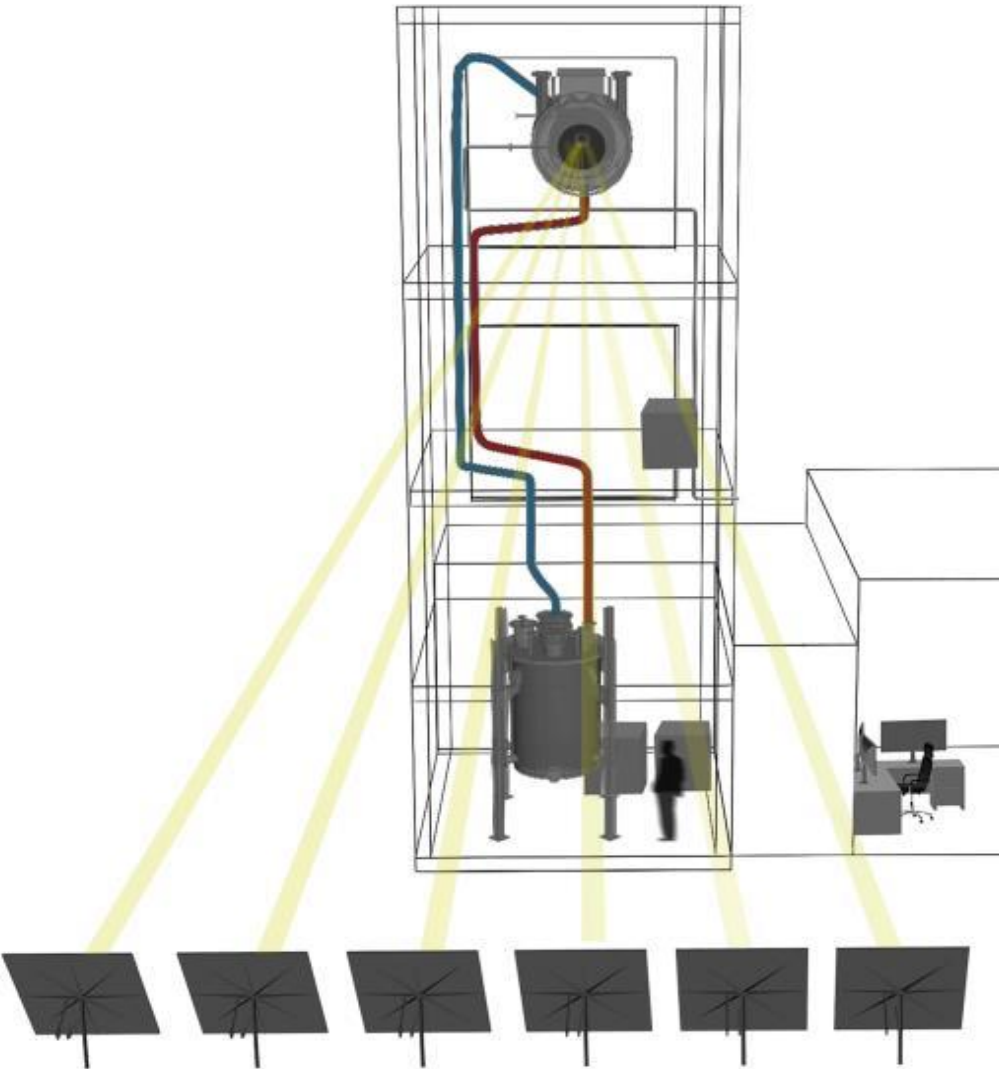


# PROTEAS Solar Field Facility

October 2015



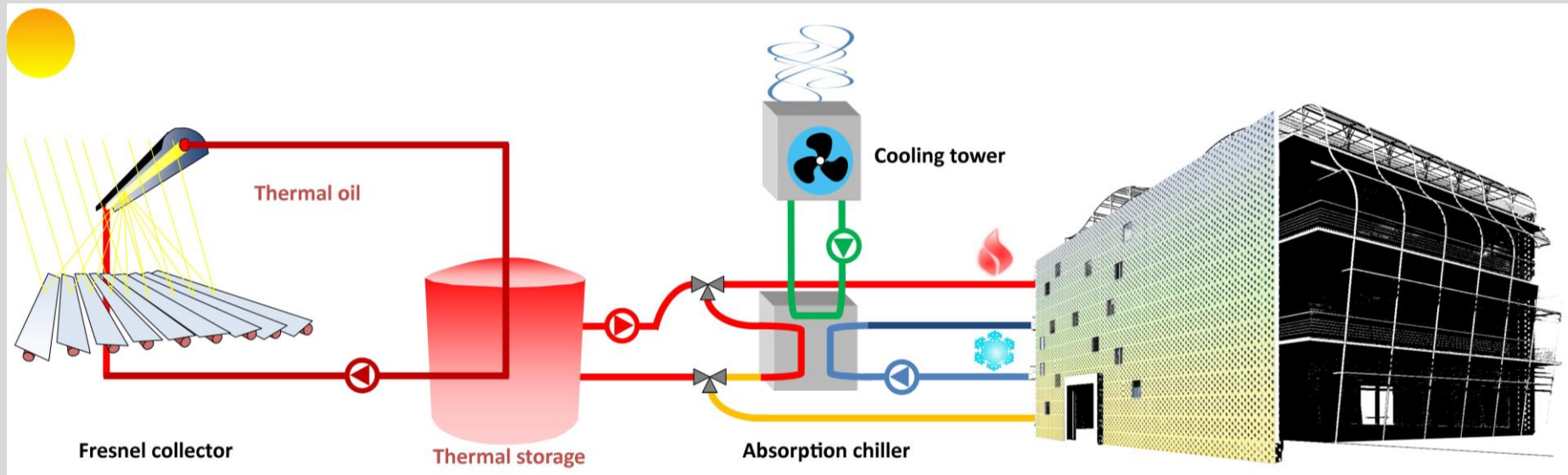






# CSP in the Built Environment:

Cooling, Heating, Providing hot water.



Refer: A. Montegon

# Linear Fresnel Facility

April 2016

Refer: A. Montenon, F. Montagnino



# **Coordination: Technoeconomic & Political Initiative by the Government of Cyprus and by the Cyprus Institute**

- Get Scientists to develop the “technical tools” and the policy options
- Engage the stakeholders and the governments of the region to take coordinated action
- Need the strong encouragement of international organizations, leading powers (esp. EU), religious leaders to move this forward.



# The Challenge II

**Climate impacts in the EMME Region:  
Particularly challenging with dire regional and  
international implications**

**It is possible to avoid calamity – it looks  
increasingly more difficult.**

**But it is possible. Innovation is possibly the  
determining factor. Can we move fast enough?**





**Thank you for your attention!**



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