

# Increase of RF EMF exposure levels at 27 - 3 GHz in the last five years: Case studies in Attica region in Greece

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## Background

Greek Atomic Energy Commission (EEAE) conducts annual in situ measurements in the vicinity of at least 20% of licenced base stations, with certain locations revisited every 4-5 years

**Objective:** investigate the factors contributing to the potential increase of the EMF exposure levels through the years

➔ perform potential regulatory adjustments or mitigation strategies

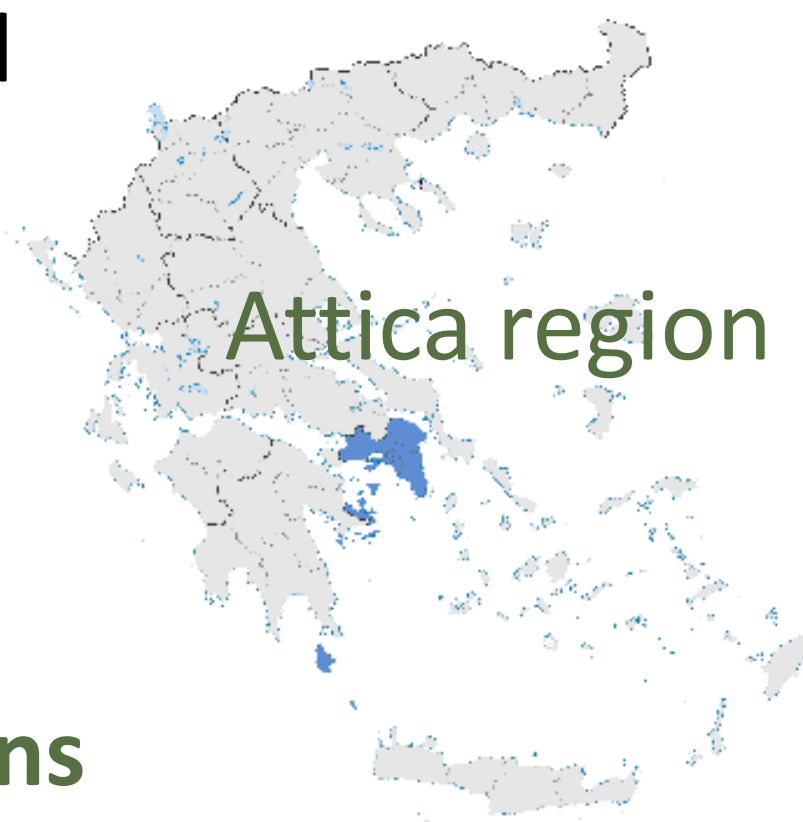


## Materials & Methods

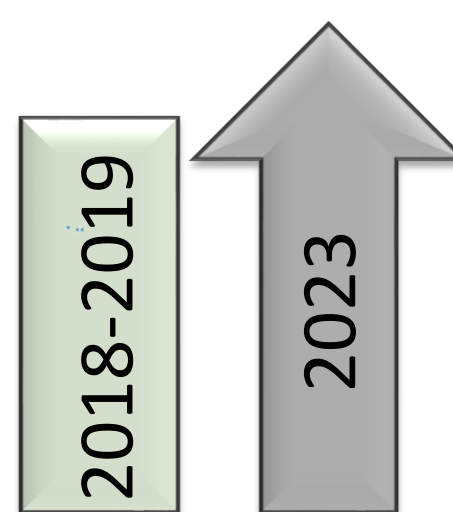
- ✓ SRM-3006, E-field antenna [27 MHz – 3 GHz]
- ✓ DL measurements at adjacent rooftops
- ✓ Frequency selective measurements at three successive heights: 110, 150, 170 cm, where the averaged E-field value over 6 minutes duration is saved

$$E_f = \sqrt{\frac{\sum_{i=1}^3 E_{i,f}^2}{3}}$$

Attica region

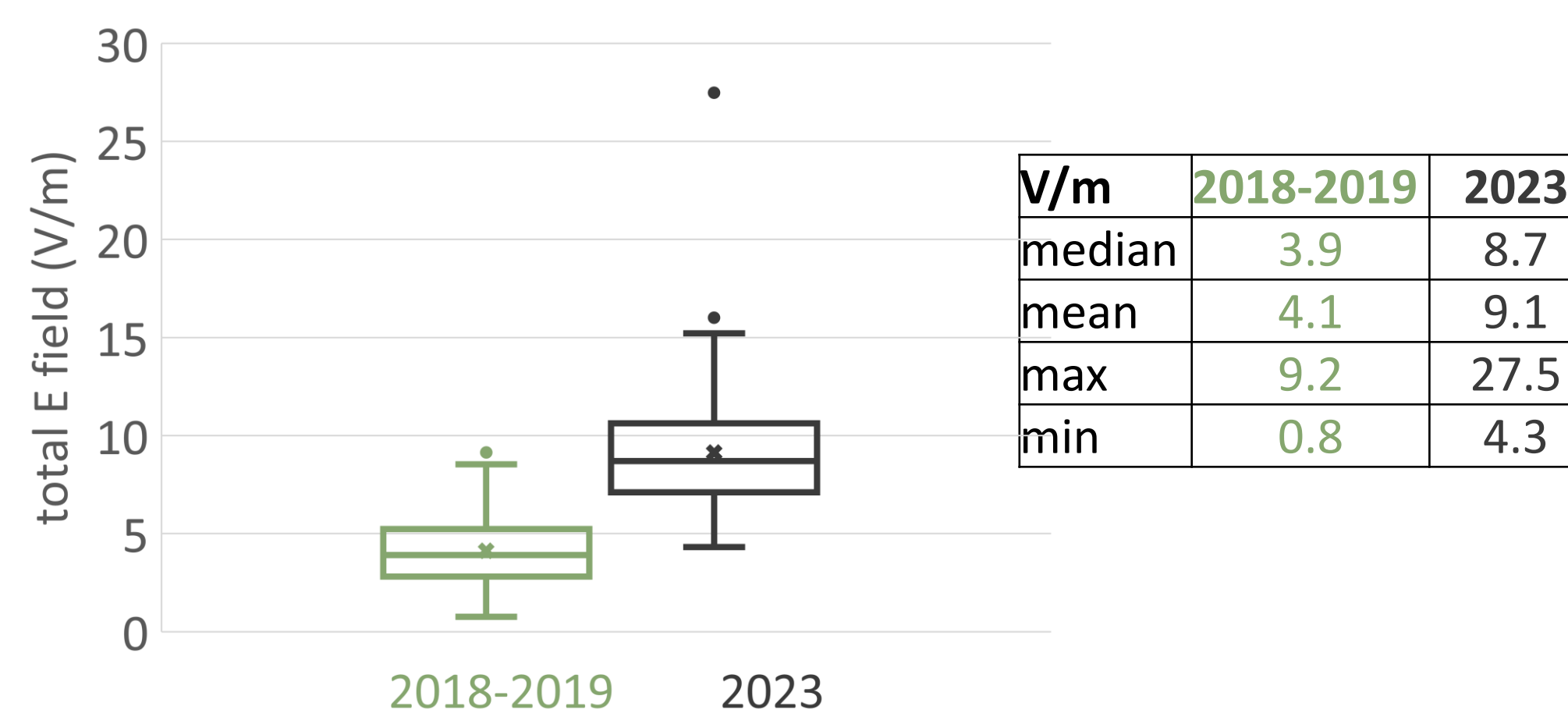


- ✓ 155 inspections
- ✓ same points



RF EMF exposure levels

## Results



## Factors that lead to the EMF levels increase

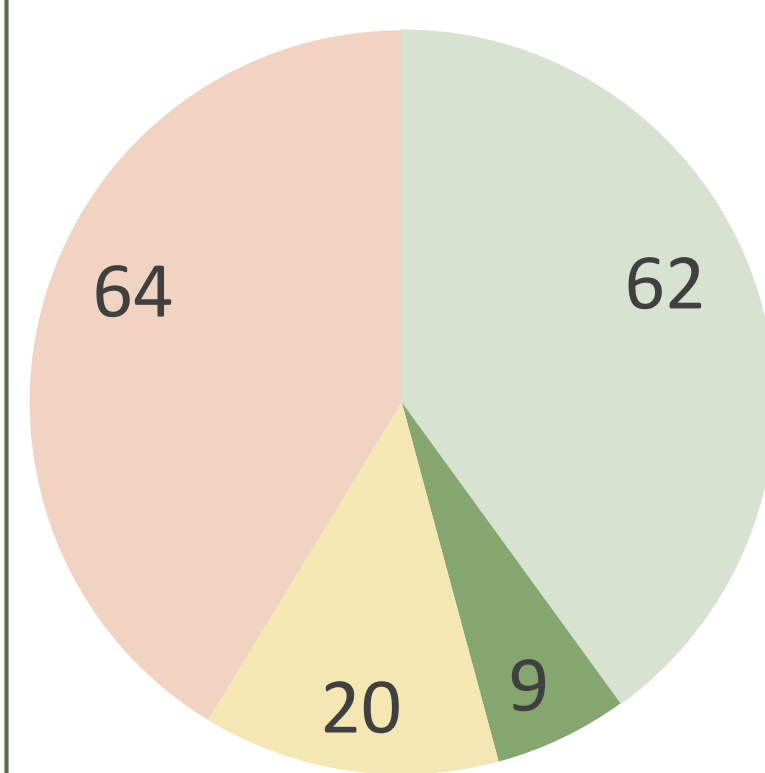
A. addition of operating mobile telecommunication service

B. changes in the installation at the same site

C. new base station(s) installed (< 50 m)

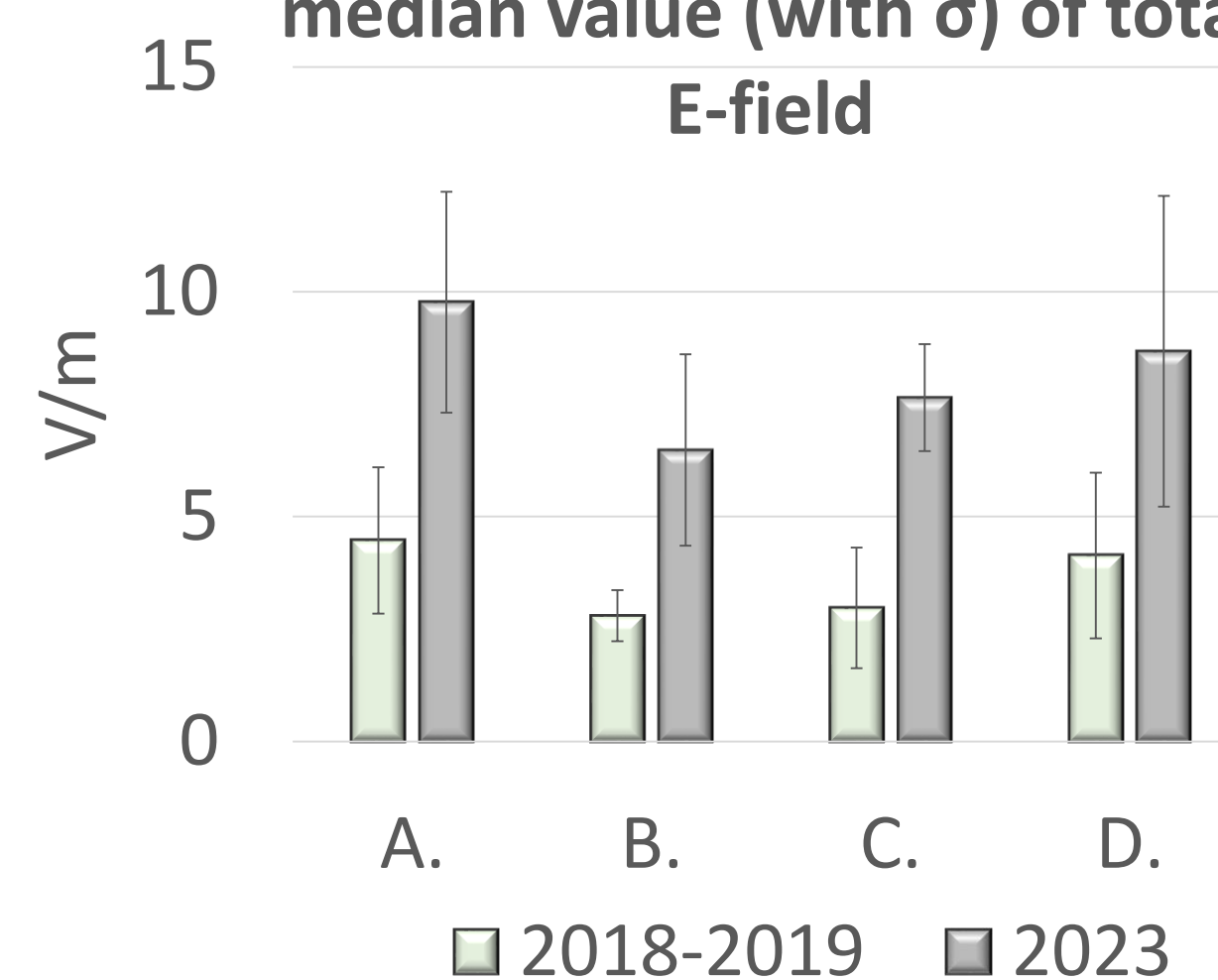
D. other reasons

# for each factor



■ A. ■ B. ■ C. ■ D.

median value (with  $\sigma$ ) of total E-field



## Representative illustrations of B. and C.



## Discussion and Conclusions

- Significant increase of RF EMF exposure levels

A. 89% of the cases ➔ due to 2600 MHz

B. height and/or type of the installed antennas, collocation with another base station, mobile telecommunication provider(s) emitting through the same antennas

C. mainly Small Cell Antennas (SCA) at low heights

D. Increase of traffic, temporal variations, increased antenna input power

- Compliance with the reference levels for general public exposure has been confirmed across all cases.