



PEDL
Process Equipment Design Laboratory

Process Equipment Design Laboratory
School of Mechanical Engineering
Aristotle University of Thessaloniki

Energy renovation of tertiary sector buildings: Perspectives and challenges

Professor Agis M. Papadopoulos
Chairman of the Board EYATH S.A.

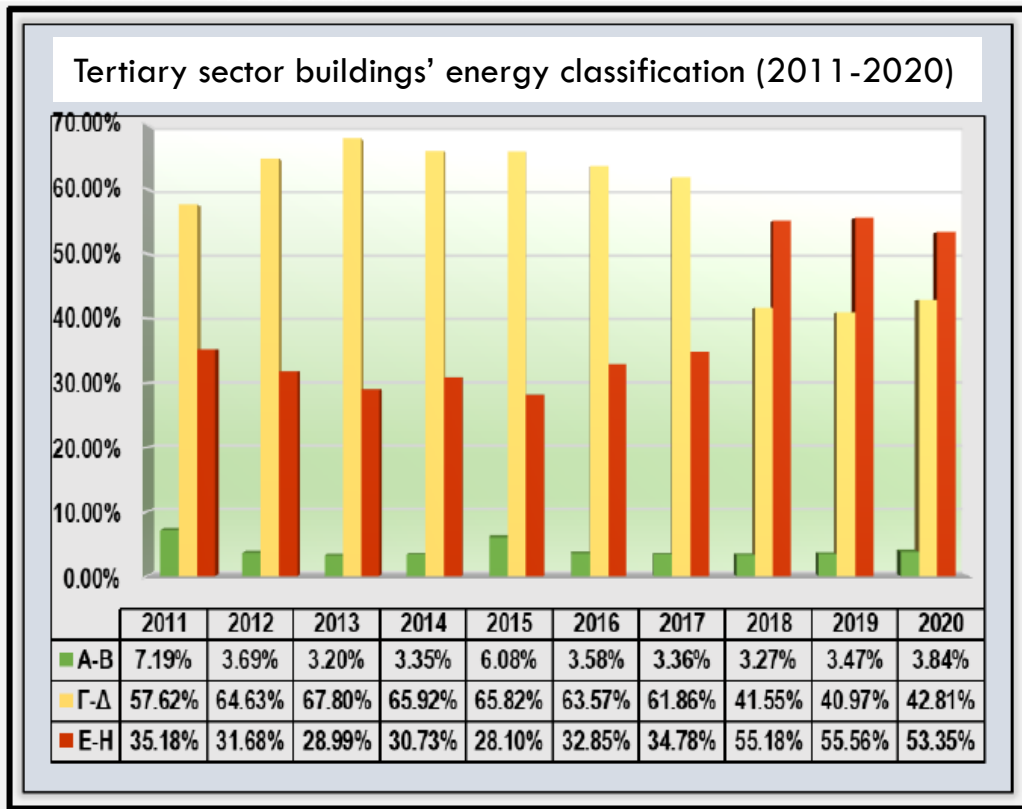
Energy Efficiency in Buildings Conference
Athens 04.04.2023

THE GOAL, THE MEANS AND THE AIMS

- *Reducing final energy consumption by **38% until 2030** compared to 2017 in all sectors (industry, transport, residential and tertiary)*
- *Means to achieve this goal is the energy upgrading of residential, public, commercial and other buildings, as well as of the industry.... Imposing mandatory energy efficiency standards and competitive procedures, as well as efficient heating and cooling by utilizing RES.*
- *An annual aim of **0,8%** new savings is determined, compared to the previous three years' average.*

[National Plan for Energy and Climate, 2020]

Building Stock: The problem



The majority of the buildings is inefficient. Cooling (154.33 kWh/m²) and heating (171.15 kWh/m²) account for 3/4 of the total energy demand.

THE EXAMPLE OF EYATH S.A. HEADQUARTERS

- Built in 1968
- Poor thermal and indoor air comfort conditions
- Inefficient (300 kWh/m², Class E)
- A typical 1960s office building of the public sector
- Located directly by the Byzantine walls of the city, opposite to the University campus and the International fair



THE EXAMPLE OF EYATH S.A. HEADQUARTERS

Ongoing renovation, to be completed in June 2023


- Thermal insulation
- High efficiency glazings
- Active sun-protection
- High efficiency HVAC system
- High efficiency lighting
- 5.8 kW PVs



THE EXAMPLE OF EYATH S.A. HEADQUARTERS



Integration of solutions – Automation and controls

Energy management



-  Active sun-protection and lighting
-  HVAC & PVs





Building management

-  Space utilization
-  HVAC linked to presence

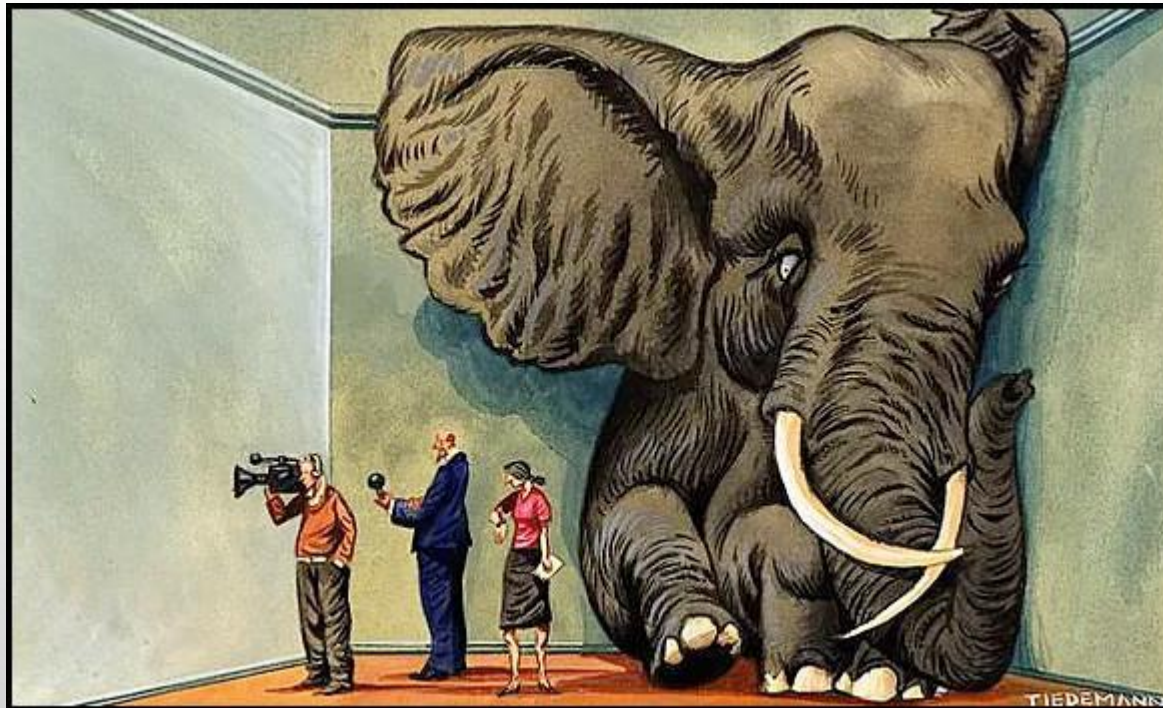
Safety

-  Security
-  Risk management

O&M

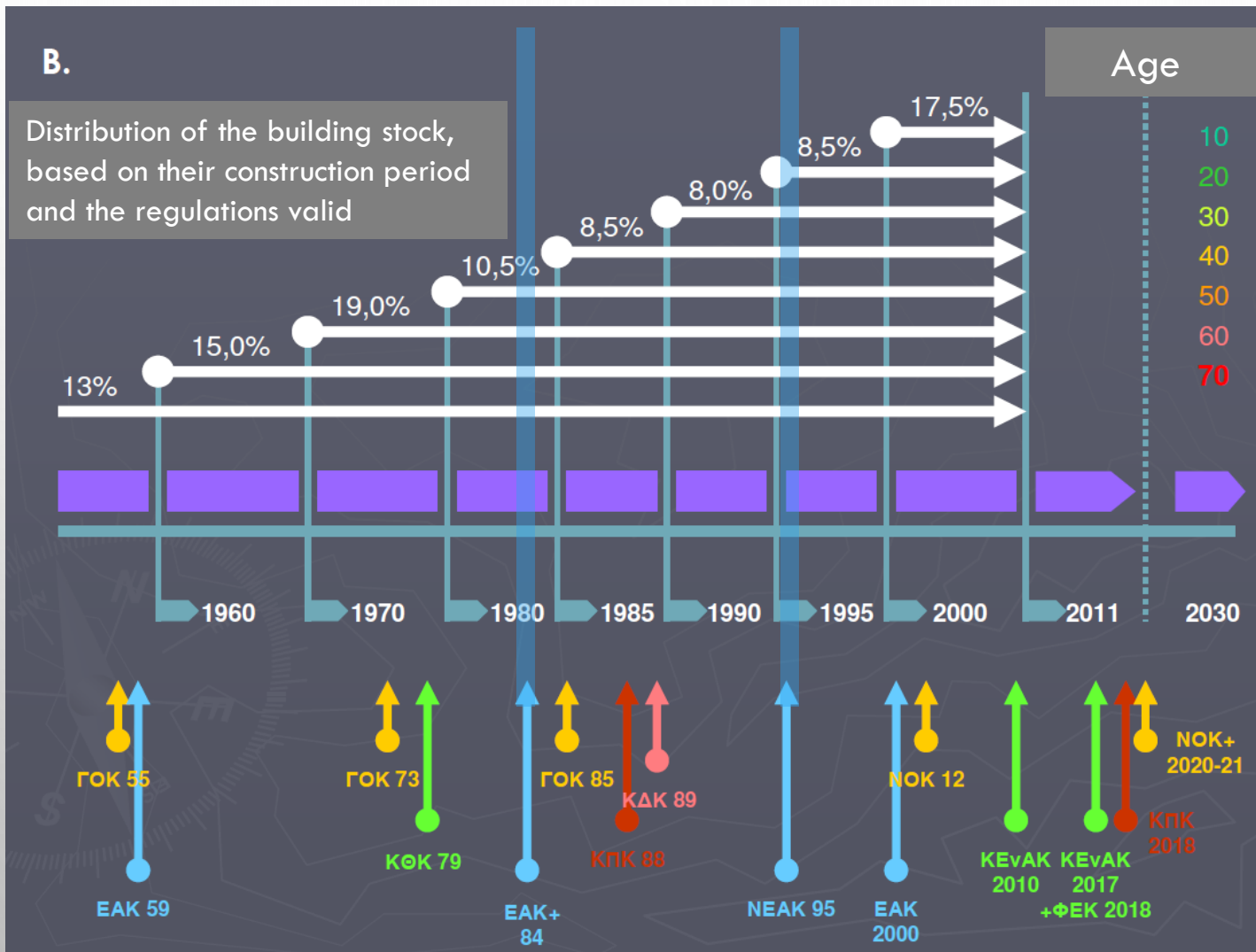
-  Real-time monitoring
-  Preventive and predictive maintenance

But.... there are barriers and obstacles



- Age of buildings
- Degradation
- Seismic protection

But... there are barriers and obstacles



THE EXAMPLE OF EYATH S.A. HEADQUARTERS



Reinforcing the building's load bearing structure, to cope with current regulations, is a PREREQUISITE for an integrated refurbishment.

And it is a cost-intensive intervention.

Concluding thoughts

The energy efficiency of the Greek building stock is rather unsatisfactory.

There are several reasons:

- The late introduction of regulations
 - The lack of controls and audits
- The, until recently, very low cost of energy
- The modus operandi of the majority of tertiary sector enterprises

The savings' potential is big!

Concluding thoughts

State of the art technologies provide solutions,
but there are barriers and hurdles.

Energy saving cannot be measured, is not bankable and not
attractive for politics.

The true benefit of savings is the avoided cost not only of the energy
as priced, but also of subsidies - hidden or not.

For far too long we applied a demand-driven design approach.
At the root of the problem lies the reduction of energy requirements.

One should keep in mind the added value of the Greek industry.

Investing in the future

