

# Energy Efficiency in Buildings conference

Accelerating Sustainable and Smart Buildings  
to increase RoI and Social Impact



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ

ΣΧΟΛΗ ΗΛΕΚΤΡΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ ΚΑΙ ΜΗΧΑΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ

ΕΡΓΑΣΤΗΡΙΟ ΣΥΣΤΗΜΑΤΩΝ ΑΠΟΦΑΣΕΩΝ ΚΑΙ ΔΙΟΙΚΗΣΗΣ

## Ανάλυση δεδομένων και καινοτόμα εργαλεία για ενεργειακά αυτόνομα κτίρια

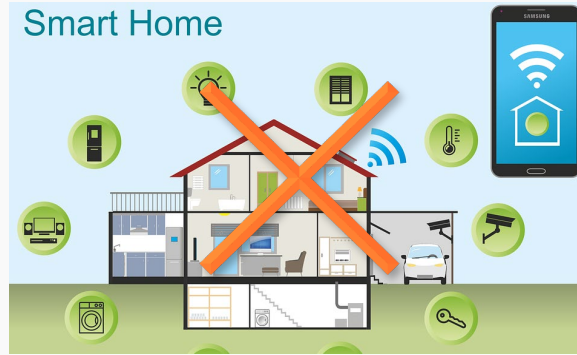
Βαγγέλης Μαρινάκης, Επ. Καθηγητής ΕΜΠ



Αθήνα, 4 Απριλίου 2023



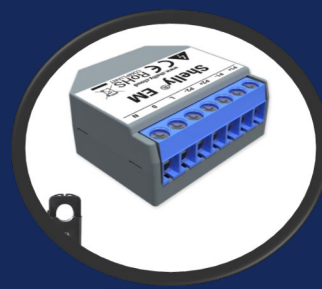
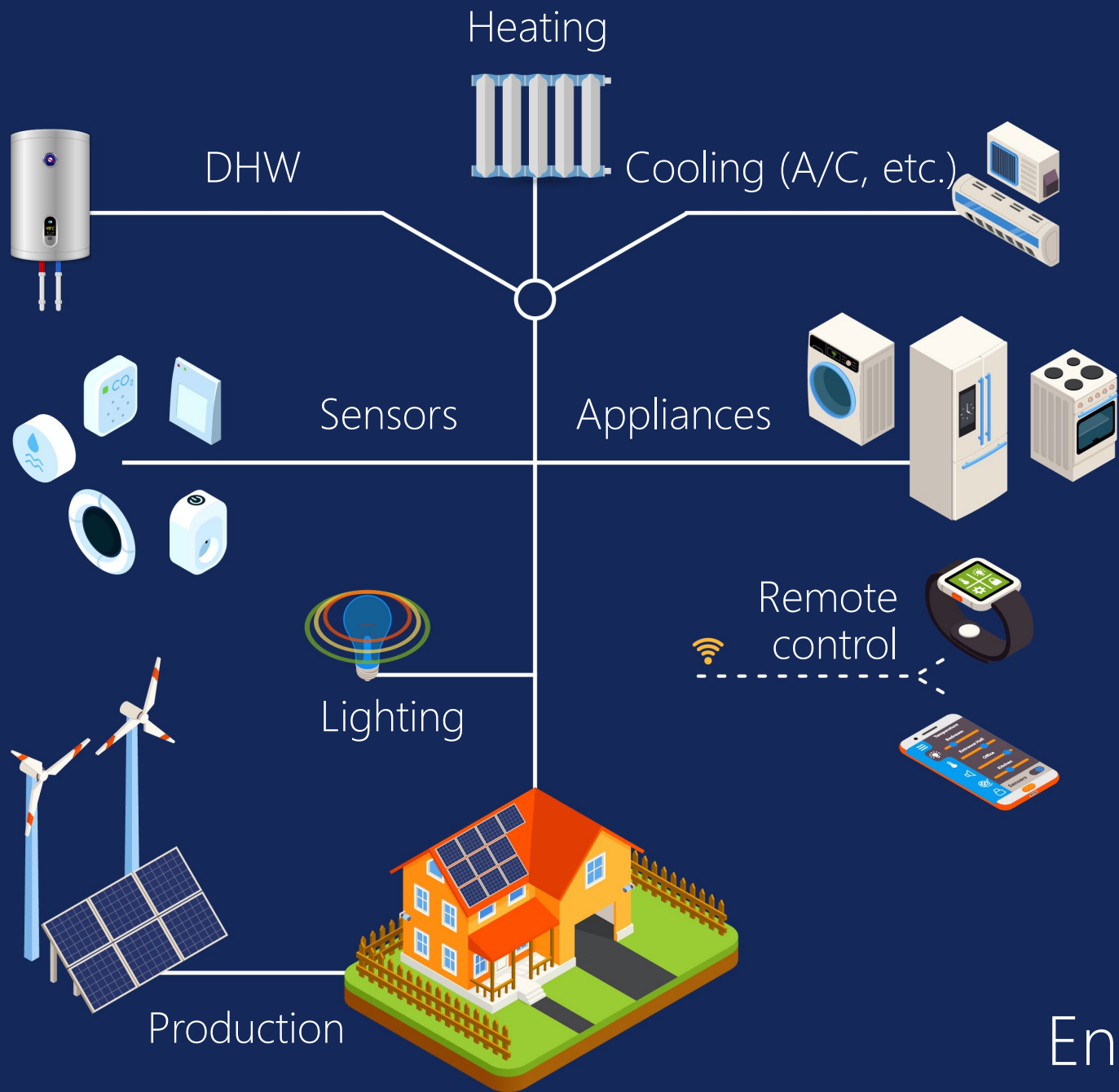
Conventional smart control systems - without the capability of customization and personalization



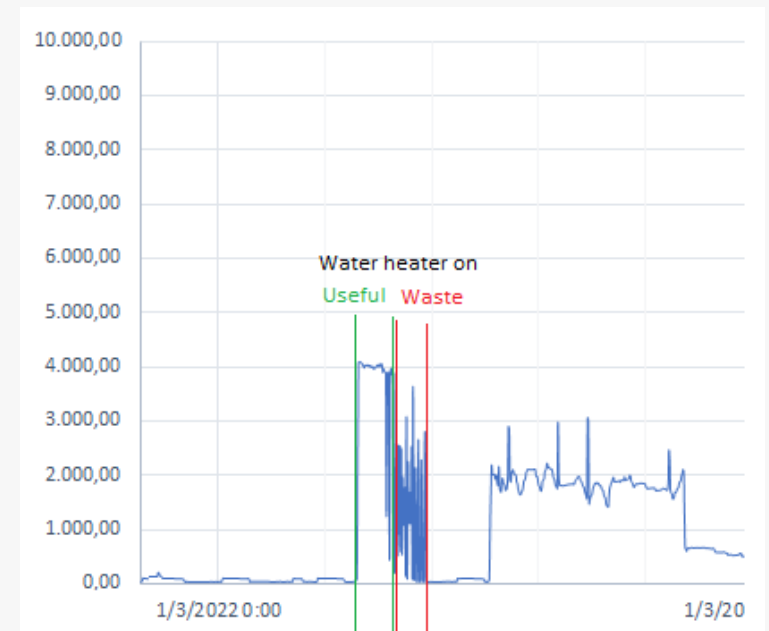
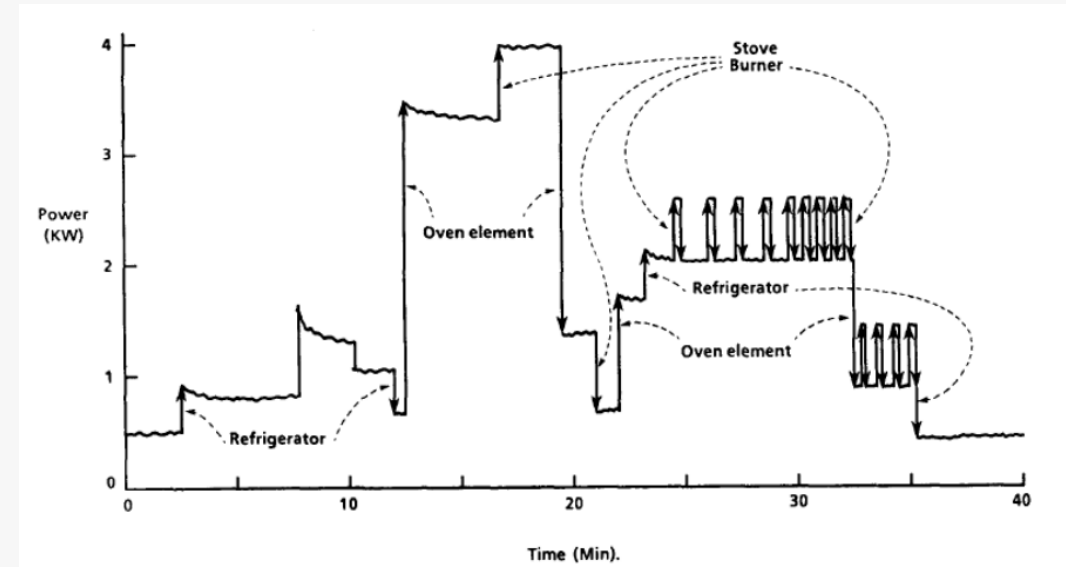
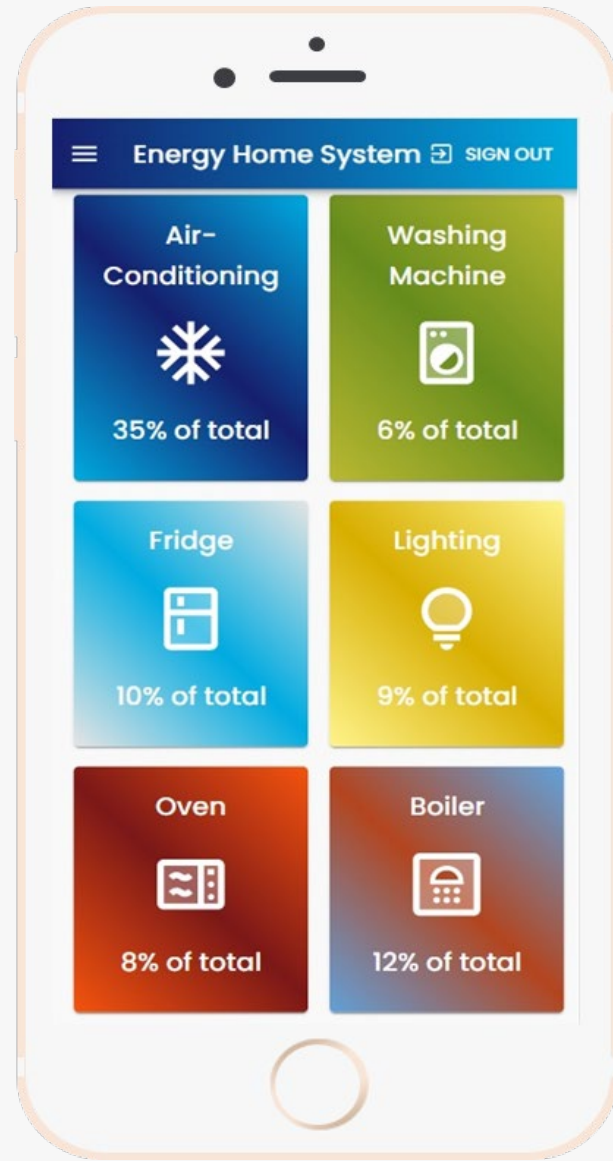
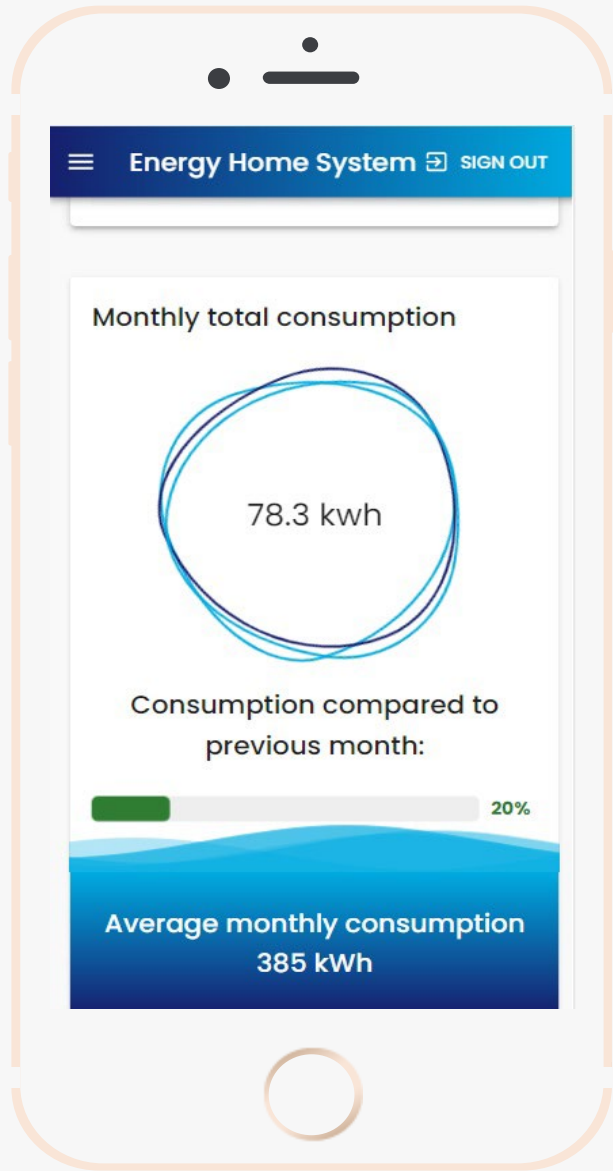
High-cost customized and time-consuming smart home solutions



Wifi heating boiler or air conditioners thermostats - without interconnection and centralized control capabilities



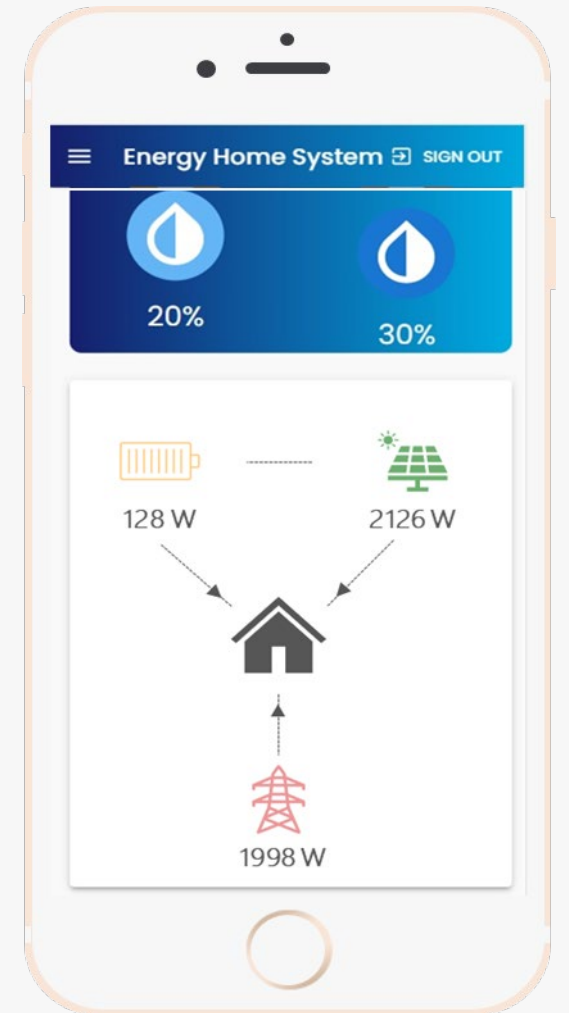
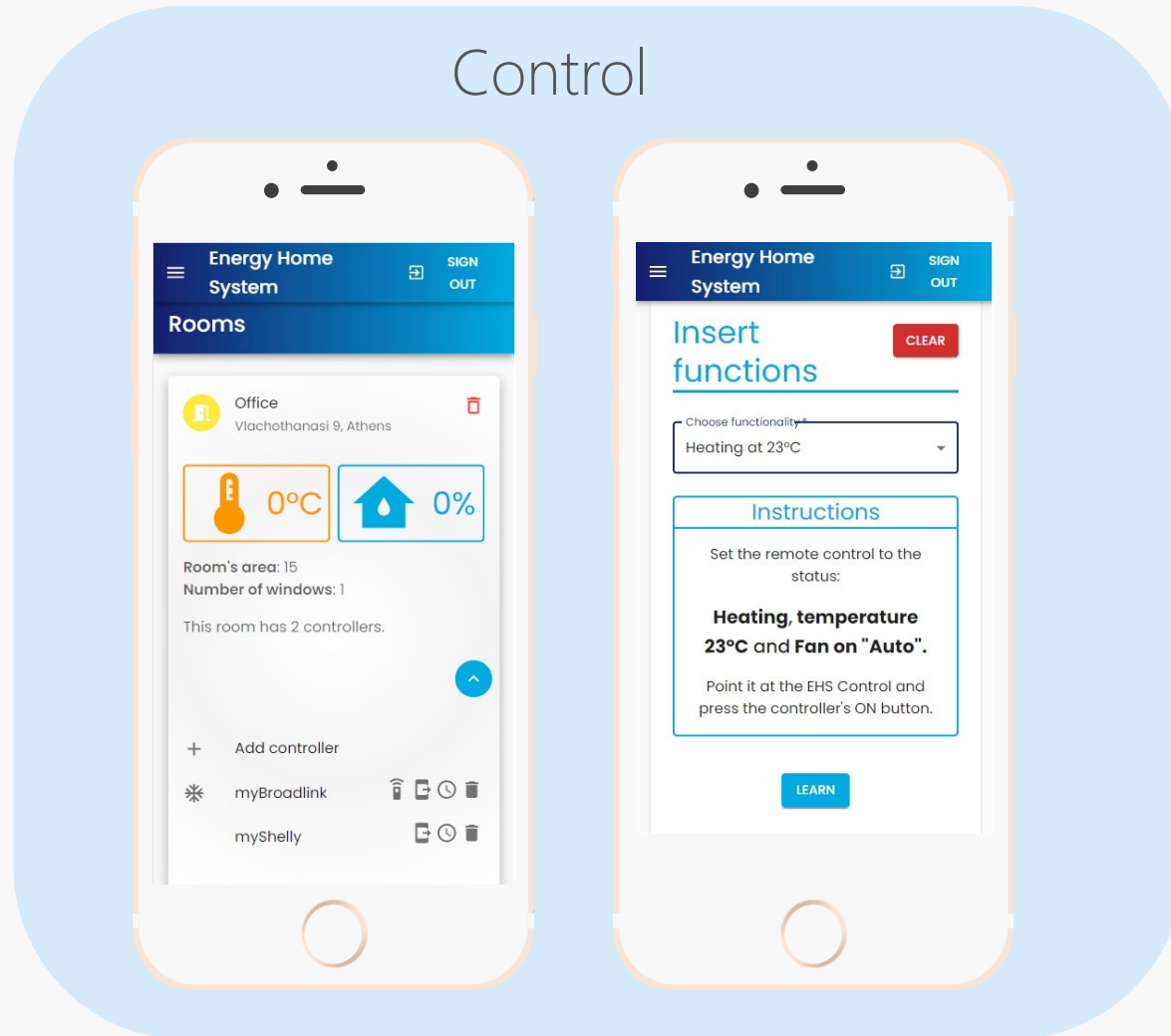
Energy Home System (EHS)





Comfort

«Net Metering»



# Energy Autonomous Buildings (1/5)

The main energy requirements can be obtained from **rooftop PV** power system installed in each home.

The excess power generated can be stored in **batteries** or can be used to charge electrical vehicles EVs.



# Energy Autonomous Buildings (2/5)

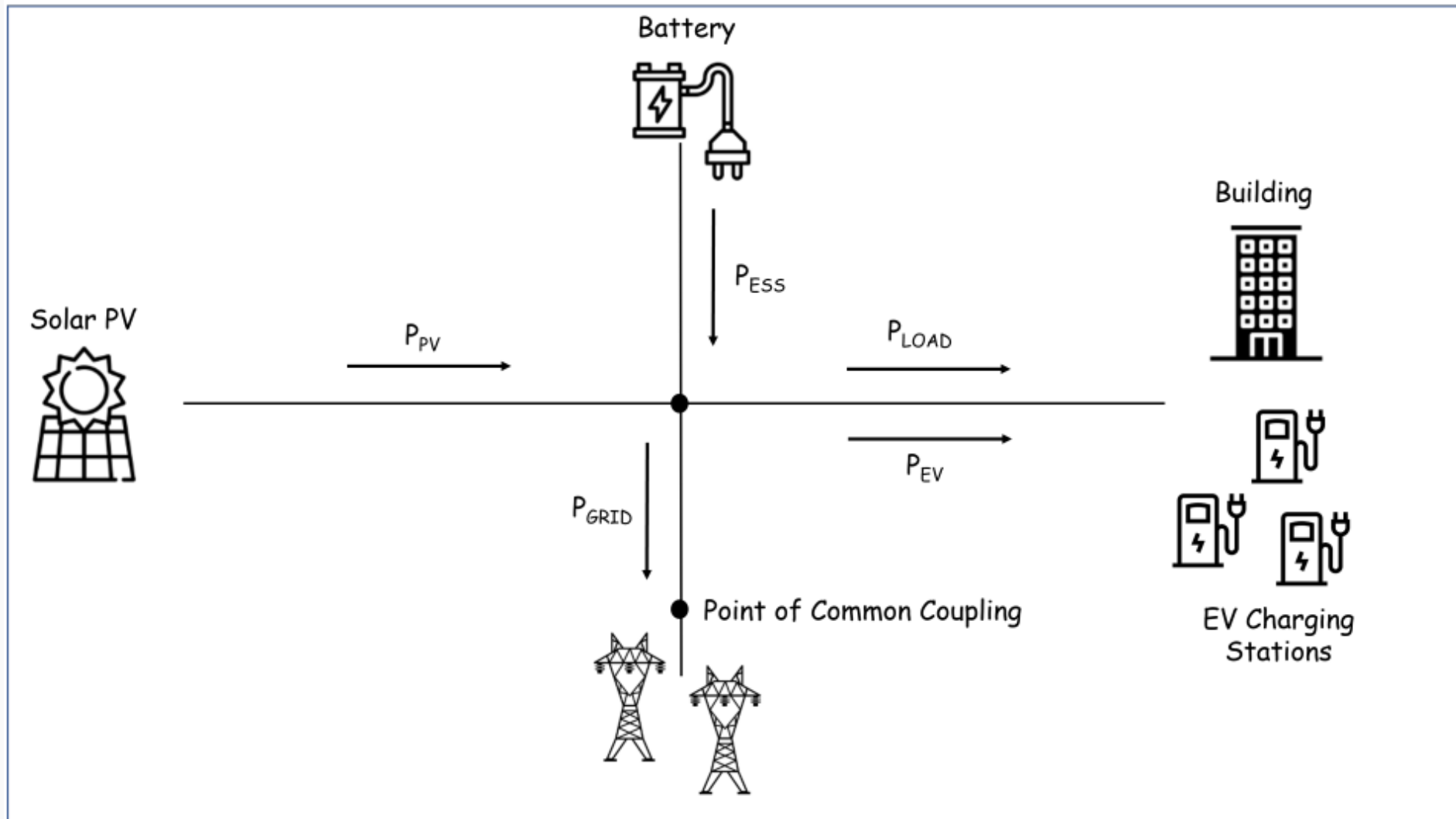
Application in PRIVATE BUSINESS



Solar power (70 kW)  
Storage (15kW)



# Energy Autonomous Buildings (3/5)

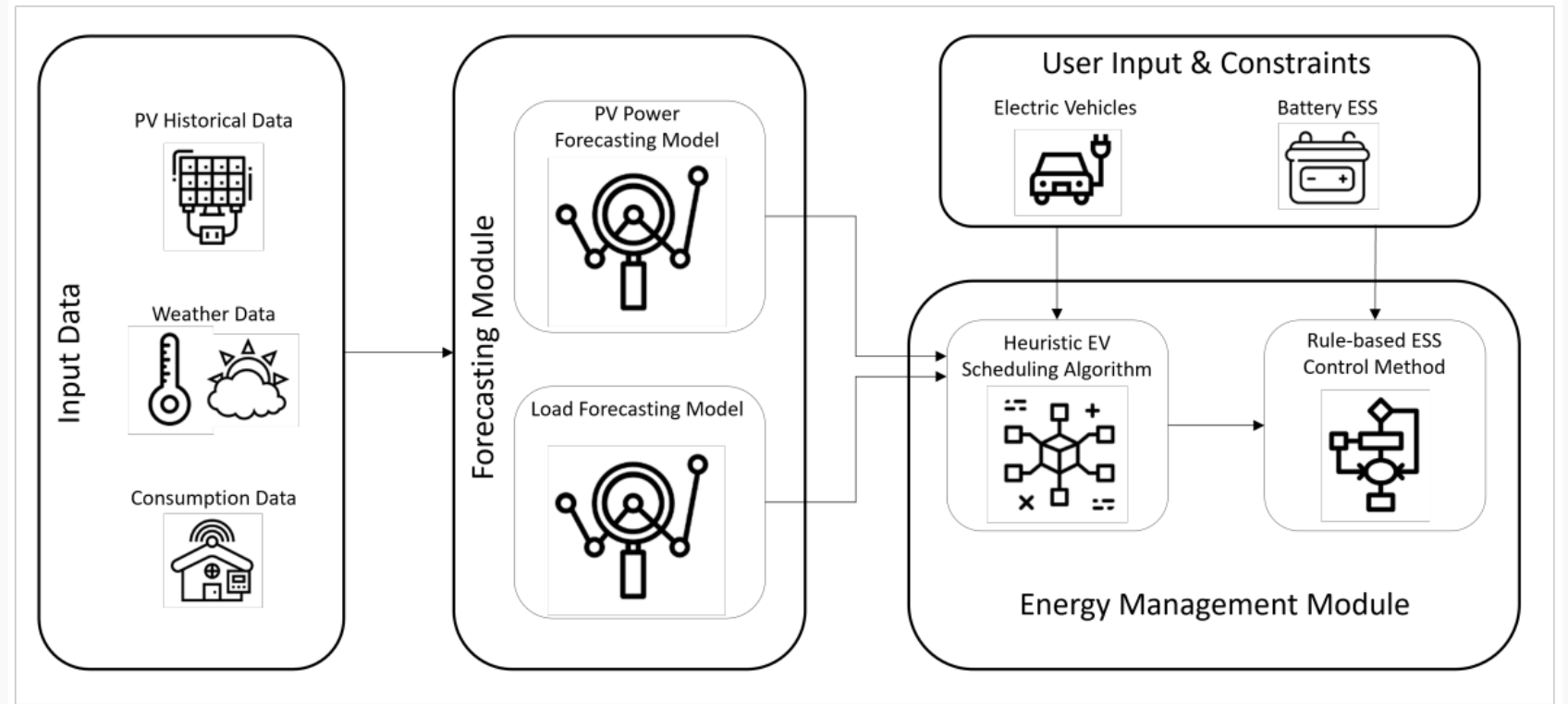




# Energy Autonomous Buildings (4/5)

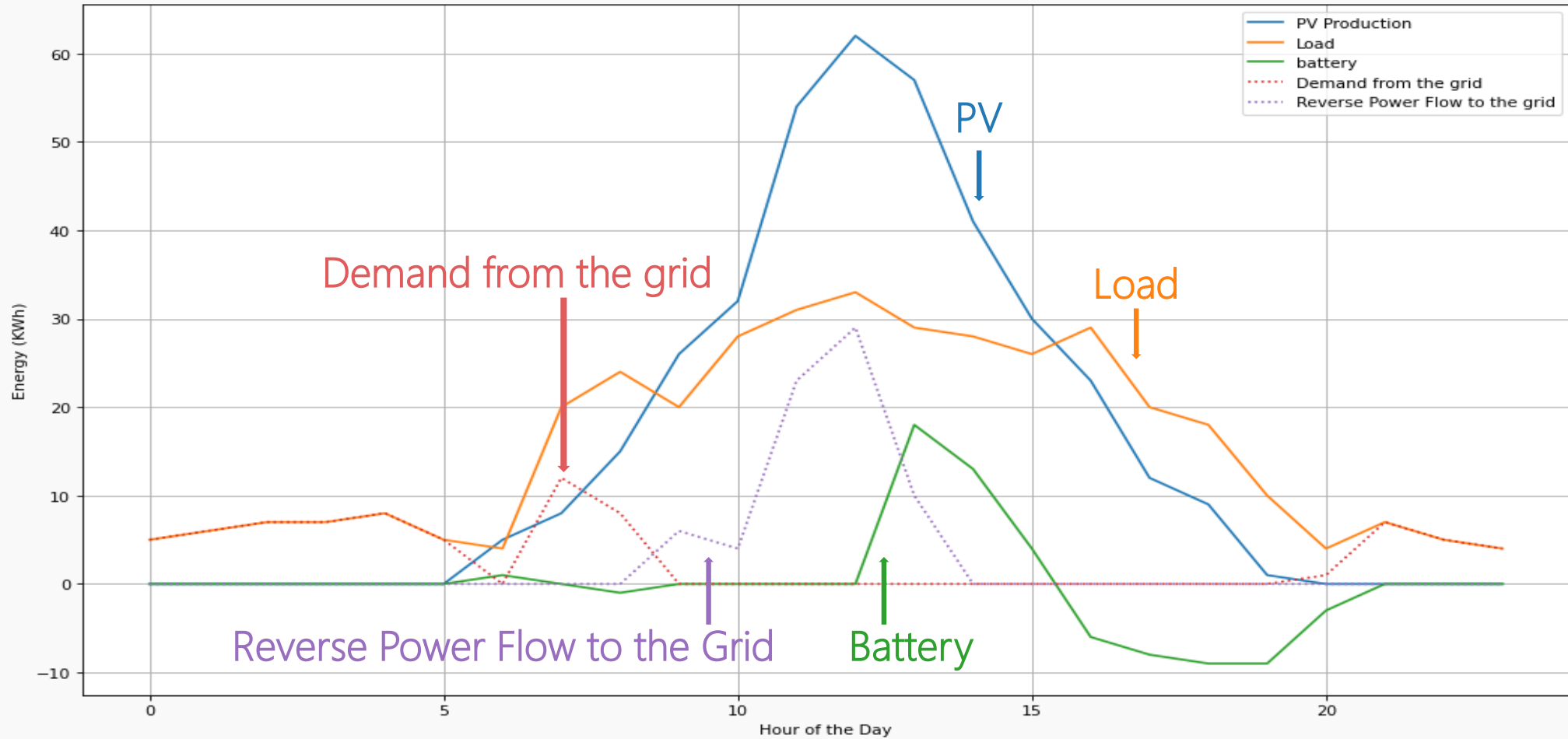
Increasing Energy  
Autonomy by  
Intelligent Usage of  
Storage

Reducing Reverse  
Power Flow by  
Optimally  
Scheduling Flexible  
Loads



# Energy Autonomous Buildings (5/5)

~12 energy autonomy





BuildON



Intelligent Energy Management Applications

# Energy Efficiency in Buildings conference

Accelerating Sustainable and Smart Buildings  
to increase RoI and Social Impact



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ  
ΣΧΟΛΗ ΗΛΕΚΤΡΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ ΚΑΙ ΜΗΧΑΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ  
ΕΡΓΑΣΤΗΡΙΟ ΣΥΣΤΗΜΑΤΩΝ ΑΠΟΦΑΣΕΩΝ ΚΑΙ ΔΙΟΙΚΗΣΗΣ

Σας ευχαριστώ πολύ!

Βαγγέλης Μαρινάκης, Επ. Καθηγητής ΕΜΠ

email: [vmarinakis@epu.ntua.gr](mailto:vmarinakis@epu.ntua.gr)



Αθήνα, 4 Απριλίου 2023