

# **Are citizens really aware of their energy footprint ?**

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- Introduction
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# Internet of Things Lab @ CUT

- Established in 2011 aiming to study, improve and leverage IoT technologies in solving real-world problems
- Expertise in sensor integration, networking, data analysis, mobile apps etc.
- Past research in various IoT verticals
  - Smart cities and parking
  - Agriculture
  - Intelligent transportation systems
- Currently on-going
  - Emergency communications and early warning systems
  - Citizen centric energy production and usage

# Current status and motivation

- **Are we really sure that citizens are ‘aware’ of their energy footprint ?**
  - Focus on electricity
    - Device consumption and usage
    - Heating and cooling
  - Direct financial impact on citizens, the environment & utility companies
- **Can we assist citizens in reducing their energy bills ?**
  - Focus on poor households i.e. those potentially facing energy poverty
  - Knowledge dissemination via the right channels
  - Potential positive outcome through changing of habits

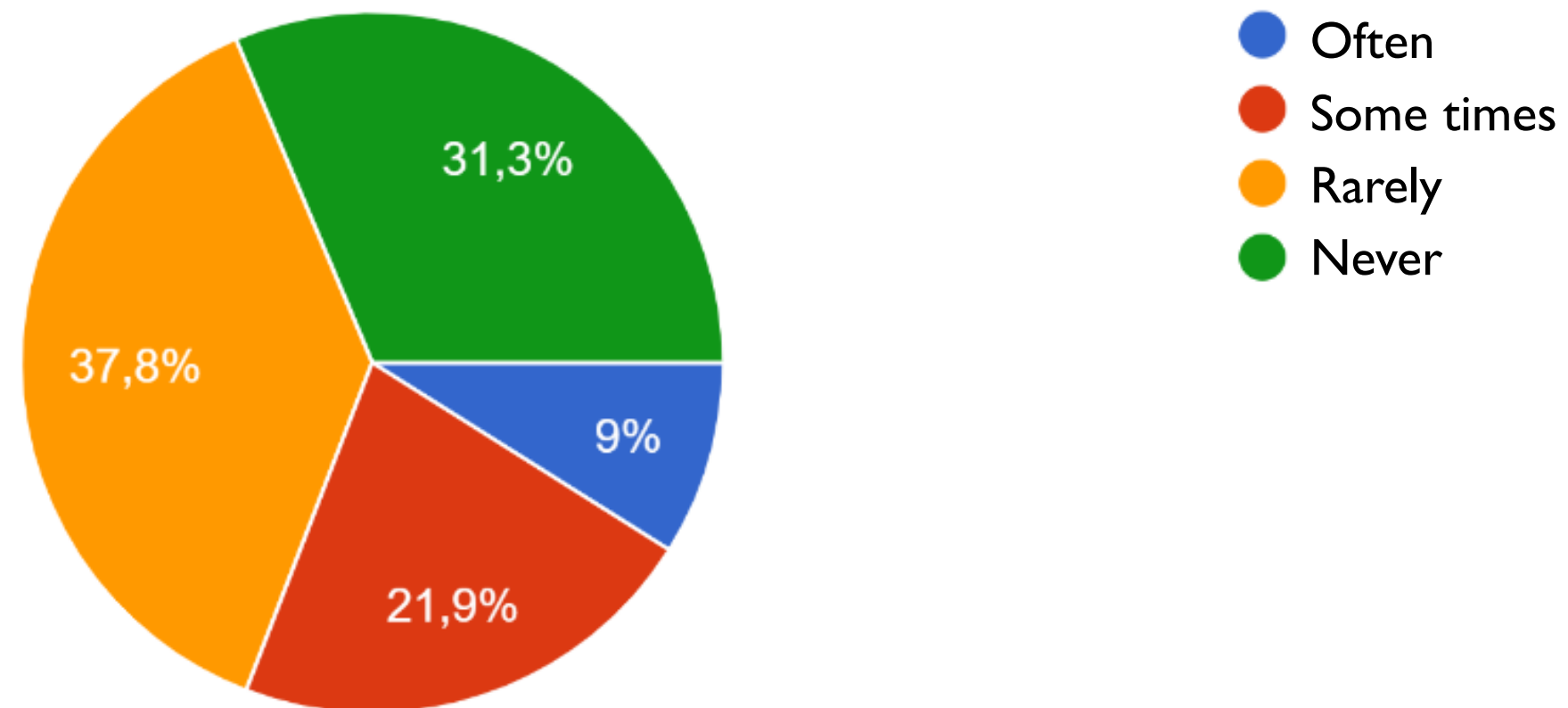


# Quantitative Survey

- Analyse the habits, knowledge and stance of citizens in Cyprus regarding:
  - Energy consumption
    - Home appliances
    - Heating and cooling
  - Renewable energy sources
  - Electric mobility
- The survey consisted of 25 questions. It was carried out online with 200 participants

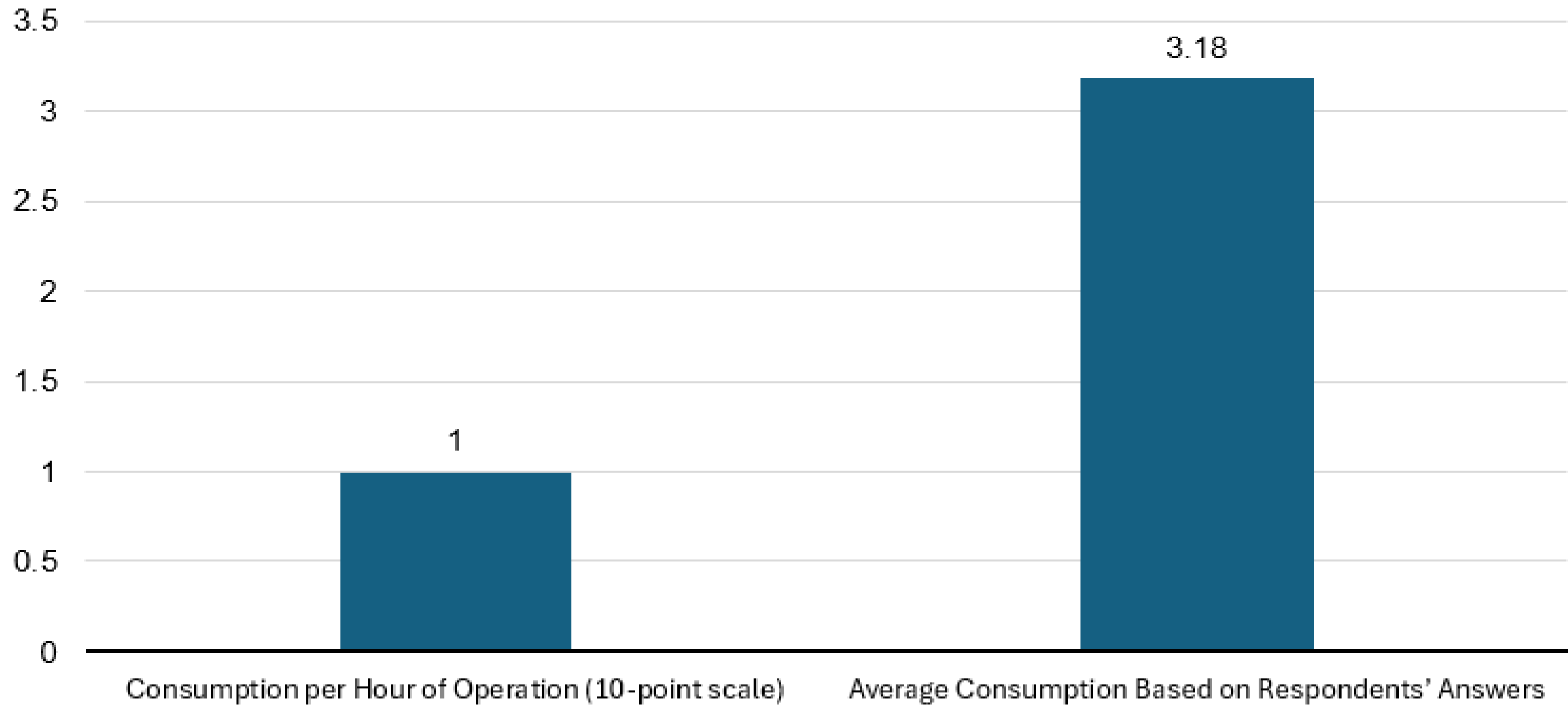
# Unnecessary usage

**Do you occasionally leave electrical appliances (excluding heating and cooling equipment) switched on when not in use?**

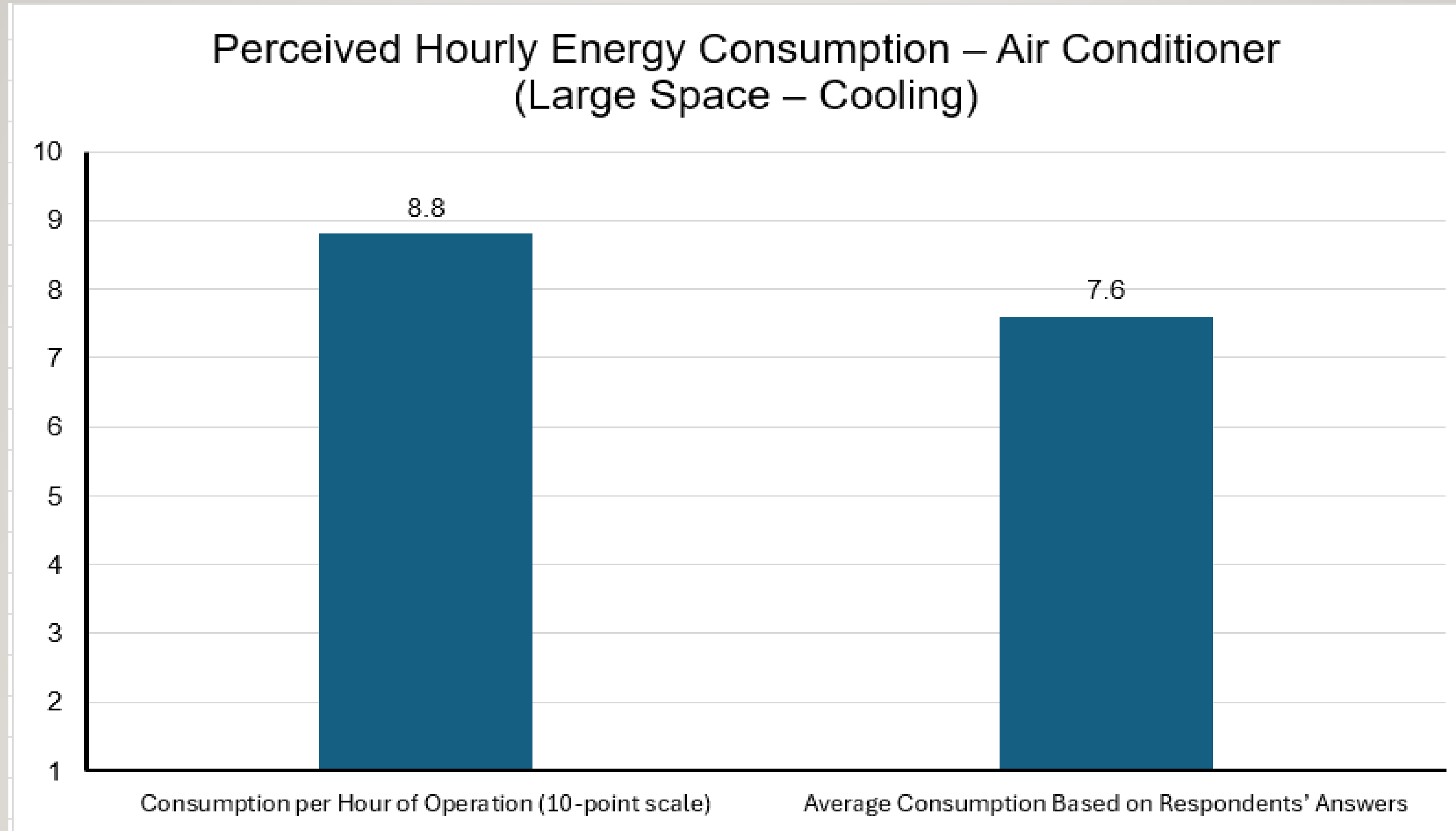


# Overestimating device consumption

## Perceived Hourly Energy Consumption – LED Lamp



# Underestimating device consumption



**Other underestimated devices: fridge, oven, hob, washing machine, water heating element**

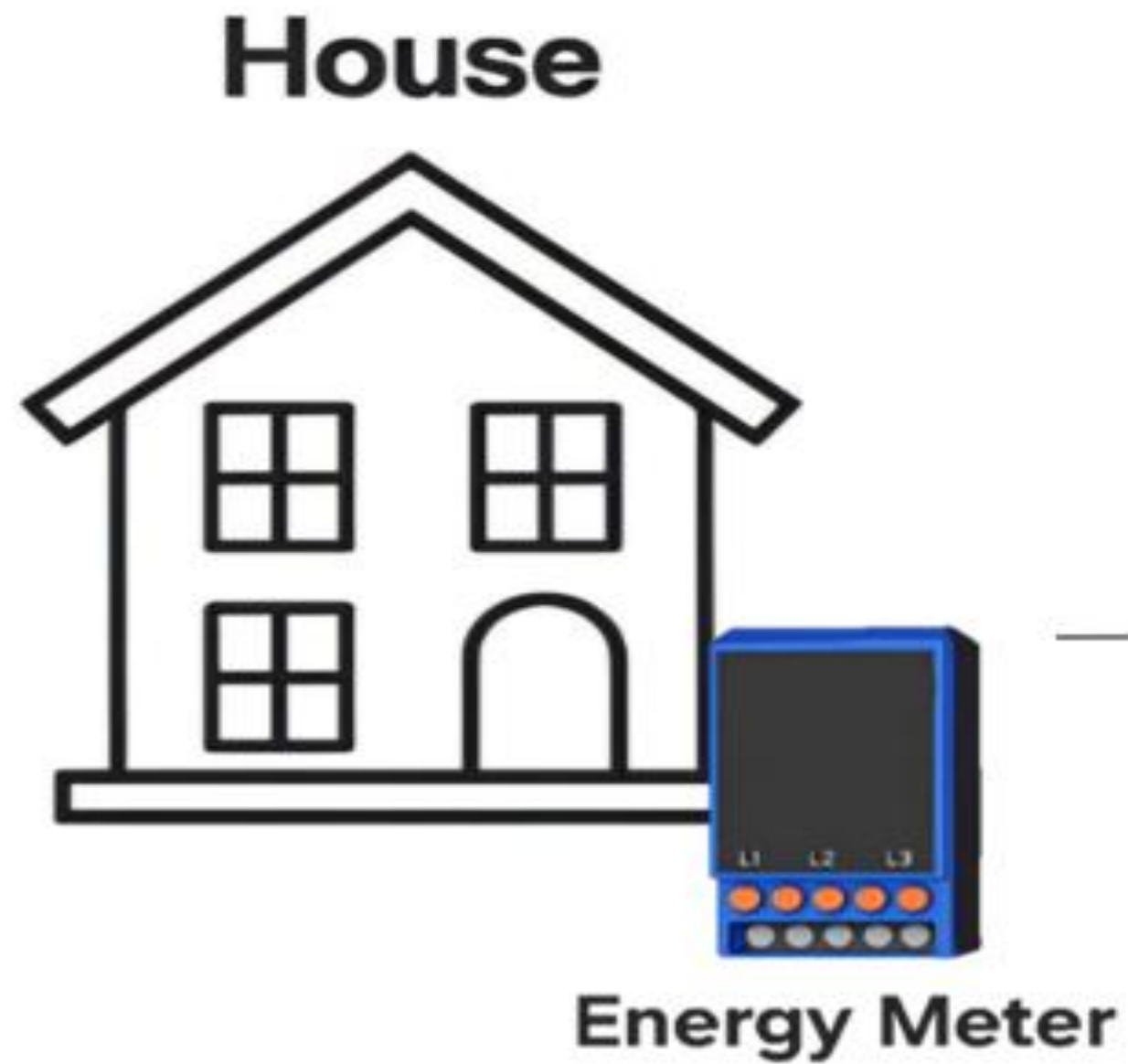
# Heating and cooling

- **59% of respondents** use electricity as the main means of heating in their home
- **Airconditioning:** the majority consider cooling as highly consuming due to the extended periods of operation during the summer months
- Only a small minority of respondents adjust temperatures according to guidelines
  - **Winter (20°C):** 4%.
  - **Summer (26°C):** 17%.

# Renewable energy & electromobility

- **99% of respondents have some familiarity with renewable energy sources.**
  - **Solar:** wide knowledge (80%) do to the penetration of the technology in Cyprus
  - **Wind:** acceptable familiarity (55%)
  - **Biomass:** low familiarity (21%)
- **Electromobility**
  - **8%** of respondents have access to a fully electric vehicle
  - **60%** of respondents are NOT interested in buying a fully electric vehicle soon

# Preliminary system implementation



House Consumption  
Solar Production



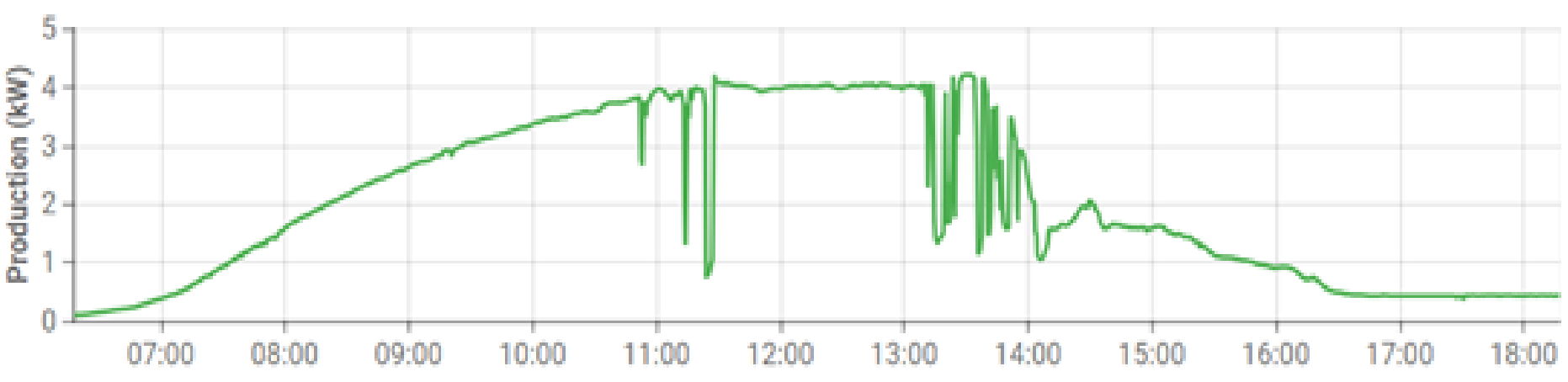
**DASHBOARD  
& MOBILE APP**

80% of respondents would like access to their real-time energy consumption on their computer or smartphone

# Smart energy monitoring - For homeowners with Solar System

## Solar Energy Production

🕒 Realtime - last 12 hours

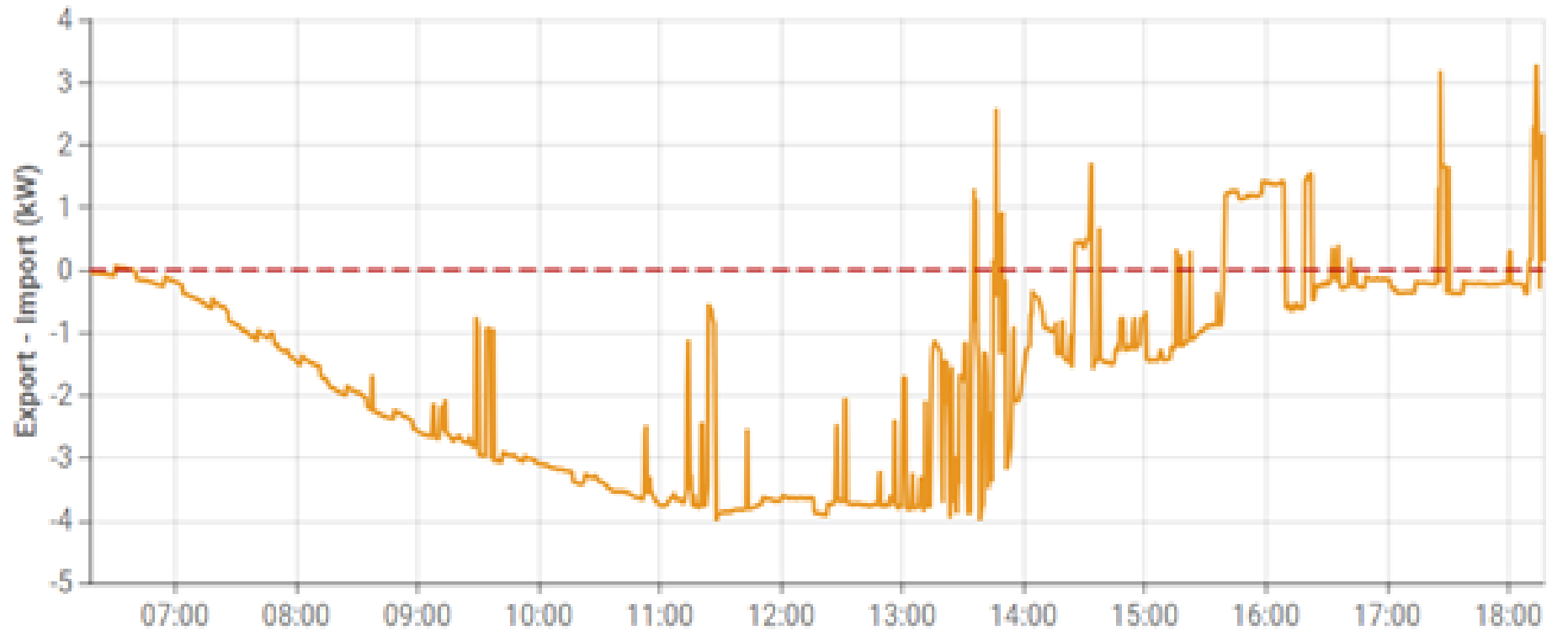


● Displayed Period Statistics - Solar Energy Production

Min	Max	Avg
0.09 kW	4.22 kW	2.05 kW

## Energy Import - Export

🕒 Realtime - last 12 hours

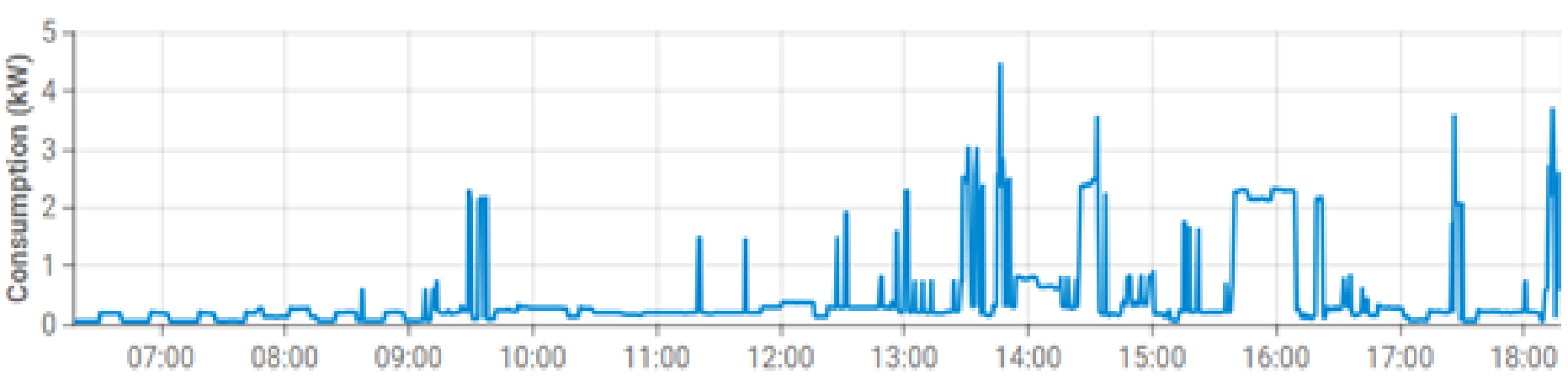


● Displayed Period Statistics - Energy Import-Export

Min	Max	Avg
-4.02 kW	3.28 kW	-1.61 kW

## House Energy Consumption

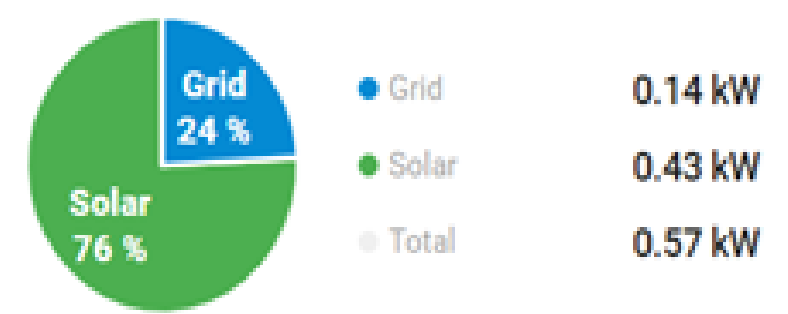
🕒 Realtime - last 12 hours



● Displayed Period Statistics - House Energy Consumption

Min	Max	Avg
0.04 kW	4.48 kW	0.44 kW

## Current Energy Source



Alarms

More Details

Totals

# Our motto



**Solar self consumption**



**Thank you !**

**?**

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