

Energy Ivianagement Information System

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EMIS

Data acquisition and data overview







ENERGY MANAGEMENT INFORMATION SYSTEM

- Internet application main tool for continuous data gathering, monitoring and analysis of energy and water consumption in buildings
- **Data source** for different strategic and action plans on local, regional and national level
- Allows easy analysis and interpretation of energy and water consumption from one centralized place
- www.isge.hr











DIFFERENT ROLES FOR ACCESSING EMIS

Depending on user role there are different EMIS interfaces:

- **1.** Guest (G) low level of authorization, data overview
- 2. Energy Manager (EM) low level of authorization, data overview, data export
- User (U) medium level of authorization, data input, data overview, data export
 most common role
- **4.** Energy Administrator (EA) high level of authorization, data input, data overview, data export, data analysis
- 5. System Administrator (SA) highest level of authorization, data input, data overview, data export, data analysis, granting privileges





EMIS STATISTICS



- ECC Energy consumption center
- Introduces scalability into reporting on energy consumption

🛪 HOME 👻 🛉 USERS 👻 🗐 OBJECT	S 👻 📠 REPORTS AND CHARTS 👻	≠ GEO ADMINISTRATION - 9 EN	IERGY ADMINISTRATION 👻 🖉 REMO	TE READINGS SENDING 👻 🗡 SYSTEN	۱-		
STATISTICS OF MY OBJECTS							
EMIS database statistics (02.03.2021.)							
ECC type	Number of objects	Number of metering points	Automatic Meters Count	Energy bill count	Number of readings	Number of automatic readings	
Complex	1.022	3.348	436	478.230	15.461.406	14.964.702	
Building in complex	4.050	3.691	461	503.133	12.921.623	12.367.155	
Free-standing building	10.539	26.190	834	3.880.506	21.075.842	19.247.179	
Part	3.688	6.981	76	900.443	1.690.778	1.471.435	
Sum - Building stock	19.299 (14.589)	40.210	1.807	5.762.312	51.149.649	48.050.471	
Public lighting	24.174	23.279	2	3.730.908	1.172	0	
Sum	43.473	63.489	1.809	9.493.220	51.150.821	48.050.471	





DATA ACQUISITION



- Energy consumption data energy and water vendor bills (monthly based):
 - Manually entered bills by EMIS users
 - Automatic bills EMIS is connected to different vendor billing data bases
- Energy consumption data from meter readings
 - Manual readings by EMIS users
 - Remote readings (hourly based) EMIS connected to automatic reading systems installed on metering points
- General data
- ECC's energy systems data
 - Heating, cooling, air-conditioning and ventilation systems, water supply system
- ECC's Construction data
- Energy certificates and audits module (energy efficiency measures)
- Energy reconstruction module
- Action plan module undergoing implementation







ENERGY CONSUMPTION ENTRY – BILLS

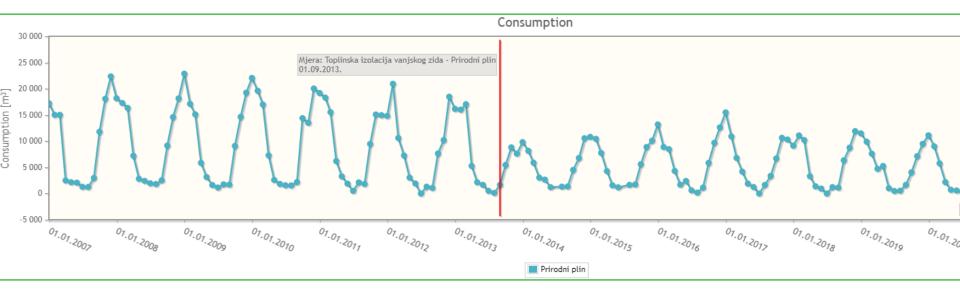
• Data in columns (mainly Consumption column) is used for the reports and analysis of energy consumption

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ENERGY AUDITS MODULE – ENERGY MEASURES

- For entry of energy audits and energy certificates
- Under energy audit or certificate, users can create entry of different energy efficiency measures that have been done on their building
- Thermal insulation of the outside walls in September 2013. (can be seen on natural gas charts as red line) – significant decrease in natural gas consumption in following years





GENERAL DATA

- Institutional user (Ministry, County, City, Municipality)
 - 16 Ministries
 - 21 Counties
 - 128 Cities
 - 428 Municipalities
- ECC type (Office, Elementary school, Hospital, etc.)
- Geographical data (county and city where ECC is located)
- This additional information about ECC makes it easier to generate targeted reports
- Introduces flexibility into reporting







EMIS

Analytical tools for verification of savings and for reporting





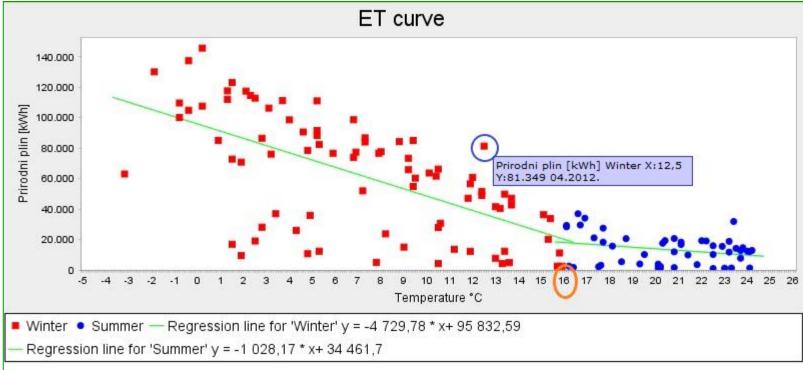
E-T CURVE



- E-T curve shows correlation between energy consumption and:
 - outdoor temperature
 - degree-day heating*

MGiPU

- If the dots are closer grouped around regression curve, energy management is better
- Croatian Meteorological and Hydrological Service sends data to EMIS



*Degree-day is a measure of heating or cooling. It represents sum of temperature differences between the indoor air temperature (by convention 20 °C) and the mean daily outdoor temperature. Only days with outdoor temperature lower than 12 °C enter calculation.

CUSUM ANALYSIS



- Shows the total savings achieved by certain energy efficiency improvement measure
- If graph drops toward negative values then savings are achieved

👹 MGiPU





ADVANCED ANALYZER

- Export of data on consumption of all or only selected energy carrier by:
 - quantity (in unit of measure)
 - energy (in kWh)
 - cost (kn)
 - cost plus VAT (kn)
 - CO₂ emission (t)
 - primary energy (kWh)
- In tabular or chart form by selected parameters (grouping)
- For one selected ECC, for many selected ECCs, only for public lighting, or for all data in EMIS
- Calculation of achieved savings in selected year compared to selected base period.
 - Base period can be one year, or several years

Ti	me interval				
Year range					
Range: All One	e Value:				
		_			
	2002.2021				
2003 💂	2003-2021 2021				
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Sampling Year M	lonth				
Locked years All	Show only locked				
Grou	uping				
by energy carrier	Series Chart				
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by city	Series Chart				
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by region	Series Chart				
by complex	Series Chart				
by complex	Series Chart				
by meter	Series Chart				
1 1 1 1					
by building user	Series Chart				
by locked state	Series Chart				





REPORTS



- EMIS can generate various pre-set reports

 exportable in Excel
- Mostly used are reports on Absolute energy consumption:
 - Sum of absolute consumption for each year of specified period
 - Yearly consumption of energy and water
 - Monthly consumption of energy and water
 - Energy and water consumption by building types
 - Energy and water consumption by ECC and by user
 - Charts of summary consumption by years
 - Exportable in PDF or Excel

Reports							
Reports	Statistics	Parameters					
🗆 🗁 Statistics							
Number of Main users per project							
Number of complex/buildings/parts per main users/object types							
Number of complex/buildings/parts/metering points per main user							
Number of objects with general data							
Number of objects with regulary entered energy bills/readings							
🗋 Numl	ber of verified met	ering points					
🗋 Numl	ber of un/locked n	netering points					
Number of energy bills and readings in last n months							
🗋 Numl	Number of energy bills per energy carrier						
Number of objects w/o active user roles U / U,EA,EM							
Energy carrier share per main user							
Energy carrier share per object type							
Energy carrier share per project							
Number of energy audits/cultural heritage buildings							
Locking years per main users overview							
🖃 📛 Special reports							
🗋 Energ	Energy bill item names and defined energy carriers items comparison						
Metering points which (according to readings) consume more energy than their parent meter points							
Months w/o energy bills							
Number of objects with at least 6 energy bills per year since 2007 (per project)							
Statistics of locked metering points/years							
Test reports							
Test reports (report)							
User	User stats per number of incorrect entered energy bills (by unit prices values)						
Absolute consumption of all my objects (specification by HR)							

Statistics of all my objects (specification by HR)







EMIS

Conclusion





CONCLUSION



- All data on energy and water consumption gathered in one centralized data base easy access
- It is easy to make customized reports due to flexibility and scalability when it comes to sorting of gathered data in EMIS
- Huge amount and variety of data collected in EMIS makes it great tool for analysing and planning future energy efficiency measures, for creating plans and strategies on local, regional and national level.









Thank you! I usuk you!

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