

Energy Audits and Energy Efficiency Design

Case study - Croatia

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General information

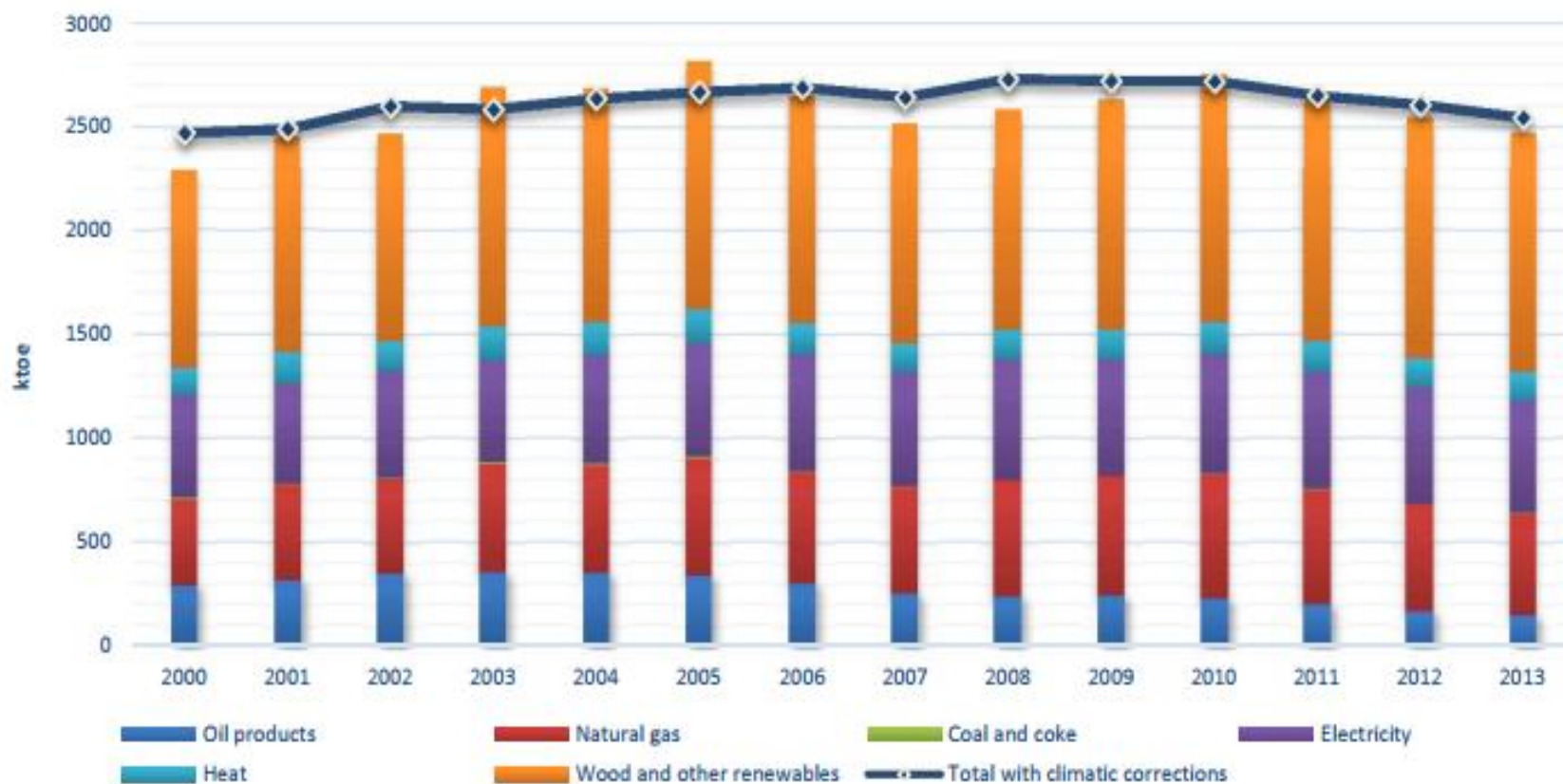
- › Buildings account for 40% of total energy consumption on national level
- › Most buildings built before 1987 – no thermal insulation
- › 83% of the buildings do not meet even 1987 technical requirements
- › Average specific energy consumption is 150-200 kWh/m² (energy grade E)
- › Environmental Protection and Energy Efficiency Fund (EPEEF) founded in 2004
- › National Energy Efficiency Action Plan created for every 5-year period
- › Strategies in line with the EU2020, 2030 & 2050 plans

Main Policies & Stakeholders

- › Croatian Energy Policy
 - › Energy Development Strategy of the Republic of Croatia
 - › Third National Energy Efficiency Action Plan
- › Ministry of Environmental Protection and Energy
- › Ministry of Construction and Physical Planning
- › Environmental Protection and Energy Efficiency Fund

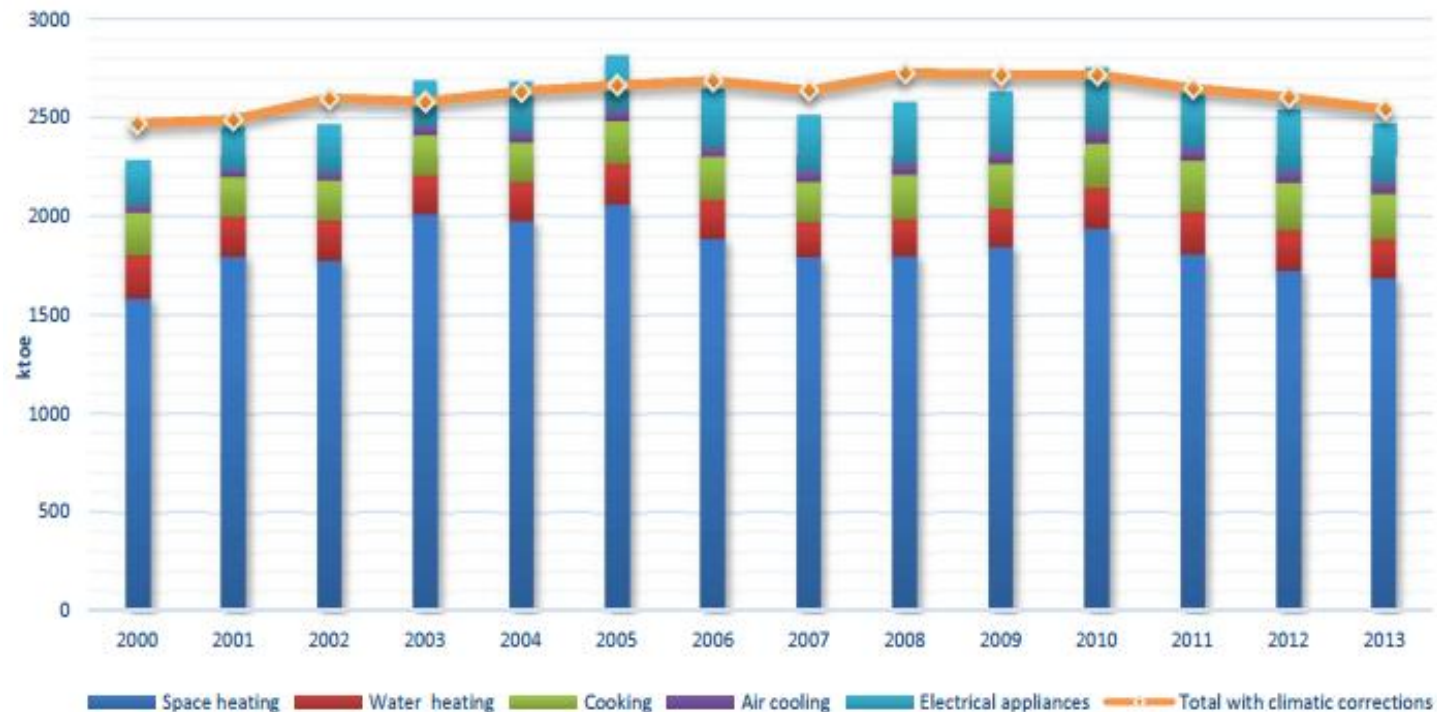
Current energy consumption trends

› Final energy consumption in households by fuel



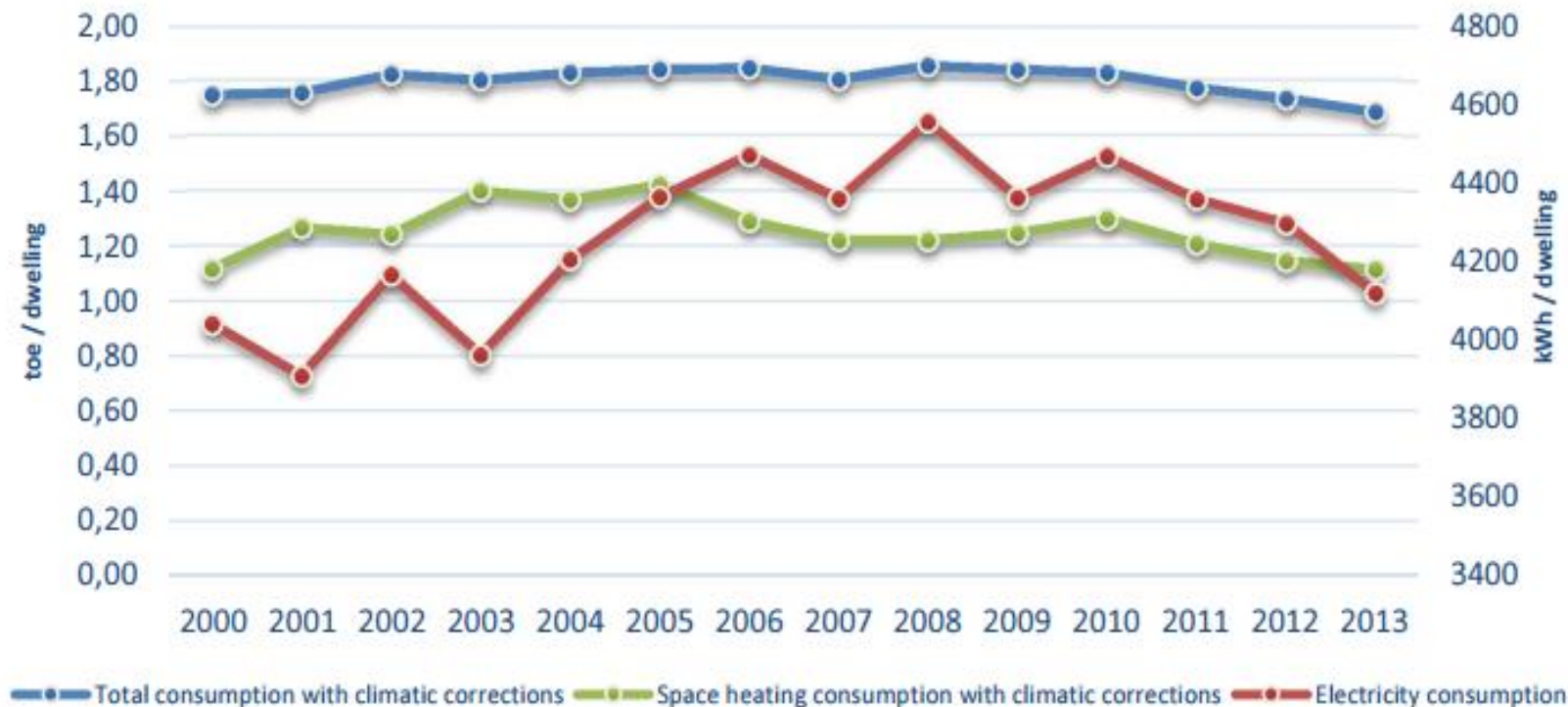
Current energy consumption trends

- › Final energy consumption in households by end-use
- › *Variations in energy consumption by years are **not** due to increased energy efficiency, but changes in the economy and climate conditions*



Current energy consumption trends

› Final energy consumption per dwelling



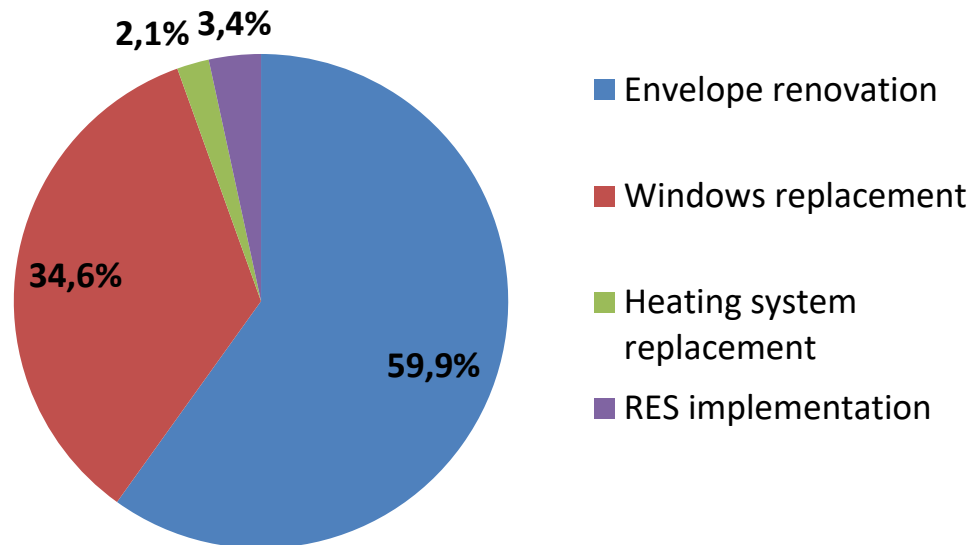
Financing energy efficiency

- › EPEEF through different programmes/schemes:
 - › Family houses refurbishment programme
 - › Multi-apartment buildings refurbishment programme
 - › Non-residential buildings energy refurbishment programme
 - › Public buildings energy refurbishment programme
 - › Co-financing construction of new buildings
 - › Co-financing purchasing A+++ appliances
 - › Co-financing energy efficient public lighting

State-of-the-art

› Family houses refurbishment programme from 2014

- › 12.000 applications
- › Co-financing envelope renovation, heating system replacement, RES
- › Allocated around 40 mil. EUR
- › 6.000 family houses (1.2 mil. m², 22.500 inhabitants)
- › Around 7.000 EUR/dwelling



State-of-the-art

- › **Family houses refurbishment programme from 2014: An example from the programme**
 - › Investment: 11.240 EUR
 - › Grant: 8.247 EUR (73%)
 - › Annual energy savings: 21.989 kWh
 - › Annual cash savings: 468 EUR
 - › Annual CO₂ emissions savings: 0,64 t
 - › Payback period: 6,4 years



State-of-the-art

- › **Multi-apartment building refurbishment programme**
 - › Buildings larger than 400 m²
 - › 866 projects so far
 - › Co-financing envelope renovation, heating system replacement, RES, energy audits and project development
 - › Allocated around 20 mil. EUR so far

State-of-the-art

› Multi apartment refurbishment programme: An example from the programme

- › Investment: 103.038 EUR
- › Grant: 29.675 EUR (29%)
- › Annual energy savings: 178.897 kWh
- › Annual cash savings: 23.654 EUR
- › Annual CO₂ emissions savings: 42 t
- › Payback period: 3,1 years



before

after

State-of-the-art

- › **Public buildings refurbishment programme (2014-2015)**
 - › 200 buildings
 - › Total area of 420.000 m²
 - › Estimated total investment around 53 mil. EUR
 - › Estimated energy consumption decrease of 30-60% (from average of 250 kWh/m² to 150 kWh/m²)
 - › Estimated CO₂ emissions savings of 20.500 t
 - › Up to 100% grant for energy audits and project documentation
 - › Up to 40% grant for construction works

Conclusions

- › Great increase in “know how” in the last 10 years
- › Energy efficiency is a great opportunity for job creation (both construction works and engineering)
- › Economic situation is the main obstacle towards significant increase in energy efficiency – although co-financing schemes exist, investments still represent significant financial barrier for citizens

Profile



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Zlatko BAČELIĆ MEDIĆ

- › Experience in team management and project coordination in energy efficiency, renewable energy and new technologies implementation
- › Team leader in preparation of investment grade energy audits in public, private and industrial sectors
- › Experience in capacity building in developing countries
- › Extensive experience in technical modeling and preparation of financial analyses for energy efficiency and renewable energy projects
- › Expertise in optimization and cost-optimality in energy efficiency projects
- › Expertise in analysis and assessment of energy sectors, including energy planning
- › Project experience across SEE

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