Ivan Vrdoljak
Croatian Minister for Construction and Spatial Planning
National Energy Efficiency Policy and Energy Performance Contracting (EPC) projects in Croatia

H. E. Mr. Ivan Vrdoljak, Minister of Construction and Physical Planning

11th October 2012
Facts about Republic of Croatia

- Surface Area: 56,594 km²
- Total population: 4,290,612
- According to the first results of the population census conducted in 2011 the Republic of Croatia has:
  - 21 counties (including the City of Zagreb)
  - 127 towns, 429 municipalities and 6,756 settlements
  - Average density of 75.8 inhabitants per km²
  - Total number of households: 1,535,635
  - Total number of housing units: 2,257,515
Climate conditions in Croatia

Average temperature in January in Croatia

Average temperature in July in Croatia

Solar radiation and photovoltaic electricity potential country and regional maps for Europe

Probable optimal range of areas for passive solar performance in Croatia
The share of total energy consumption in buildings in 2010 in final energy consumption:

- Total energy consumption in buildings: 42.30%
- Transport: 32.70%
- Industry: 22.10%
- Construction: 2.20%
- Agriculture: 3.90%
In Croatia there are approximately 2.2 million buildings/apartments (app. 150 million m² of useful surface), 45% of which have been built before 1970.

Non-residential public sector buildings app. 5m²/inhabitant = 25 million m²
Share of inhabited residential buildings/apartments in Croatia

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>do 1919</td>
<td>9.1%</td>
</tr>
<tr>
<td>1919-1945</td>
<td>7.3%</td>
</tr>
<tr>
<td>1946-1960</td>
<td>10.9%</td>
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<tr>
<td>1961-1970</td>
<td>20.1%</td>
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<tr>
<td>1971-1980</td>
<td>23.1%</td>
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<tr>
<td>1981-1990</td>
<td>17.2%</td>
</tr>
<tr>
<td>1991-1995</td>
<td>3.4%</td>
</tr>
<tr>
<td>Iza 1996</td>
<td>5.0%</td>
</tr>
<tr>
<td>Unknown</td>
<td>3.5%</td>
</tr>
<tr>
<td>Unfinished dwellings</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Specific annual energy need for heating

<table>
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</thead>
<tbody>
<tr>
<td>kWh/m²</td>
<td>250</td>
<td>230</td>
<td>210</td>
<td>200</td>
<td>180</td>
</tr>
</tbody>
</table>
Energy efficiency in buildings - status

* Total useful surface in residential buildings - 149.38 million m²
* Total floor area of non-residential buildings – 49.38 million m²
  * Out of which 9.58 million m² public buildings (22%)
* Average consumption of thermal energy for heating 200-250 kWh/m²

Potential savings up to 60% in public buildings

Source: Odyssee indicators, www.buildup.eu
Legal framework for EE in the Republic of Croatia

- Law on end-use efficiency (EPBD, ESD, ErP) (NN 152/08 and 55/12)
- Ordinance on calculation methodology for approximate definition of energy savings in direct consumption (NN 40/10)
- Ordinance on energy audits of constructions and energy certification of buildings (OG 81/12)
- Ordinance on control of reports of energy audits of constructions and energy certificates of buildings (OG 81/12)
- Ordinance on requirements and criteria to be met by energy auditors of constructions and energy certifiers of buildings (OG 81/12)
- Regulation on contracting energy service for public sector (OG 69/12)
- Ordinance on energy savings measurement and verification methodology (OG 77/12)
Energy Efficiency in buildings - actions

- New requirements on energy performance of buildings
- Use of renewable and alternative energy systems for all new buildings as well as for reconstruction of the existing buildings
- Obligatory public display of energy certificates in public buildings for all buildings larger than 500m² and starting from 2015 for all buildings larger than 250m²
- Independent control systems for energy performance certificates
Managed by the **Ministry of Construction and Physical Planning**

**Status:** approx. 11,000 public buildings (1300 energy audits)
- Average consumption: 252 kWh/m²
- Average surface: 1,074 m² net useful area

**Target:** 1% annual reconstruction of all public buildings (app. 100 buildings)
- Decrease of annual consumption of thermal energy for heating to approx. 50 kWh/m²
- Systematic integrated reconstruction taking into account the entire lifetime of the buildings - deep reconstruction of buildings in order to achieve maximum savings, 30-60% increase in energy efficiency of public sector buildings
- Creation of new employment (20,000 jobs annually) that contribute to economic development and sustainable growth

**Total investment value:** € 119 million
Retrofitting Program for Public Sector Buildings

**Target groups**

* **buildings owned by local self-government units** (cities, municipalities, and counties)
* **buildings owned by the central government**
  * Budgetary users (ministries, departments, institutes, academies, offices)
  * Extra-budgetary users
* **buildings owned by public sector companies**

**Final Beneficiaries**

* owners, users, and managers of public sector buildings
* energy service providers (consultants, engineers, ESCO services)
* financial institutions
* certified engineers of architecture, construction, mechanical engineering and electronics
* business and NGO sector
* households
* media
Energy Services Company ("ESCO") and ESCO "Guarantee Saving" Structure

- Creates a Growth Model for the ESCO and Energy Efficiency Industry
- Simplifies Requirements of public building owners and of local banks
- Utilizes Funds to “Buy-Down” Interest Rate to Below Market Rates
- Has 14-Year Repayment Terms

Diagram:

- Investor
  - Public building owners
- Savings Guarantee
- ESCO
  - "Performance Risk"
- Financing
- Fixed Repayment Schedule
- CBRD / EFRD, EEEF, Jessica / other Financial Institutions
  - "Credit Risk"
Investment Criteria for EPC projects

- Acceptable project economics (Risk Profile)
- Adequate return to lender
- Compliance with Construction and Environmental Regulations
- Compliance with International Performance Measurement and Verification Protocol “IPMVP”
- ESCO must manage risks of development, construction, technology, cost overruns and performance (savings)
- Public building owners current operating costs will be reduced by an amount at least equal to the debt service required to repay the turn-key construction price for ESCO to implement EEPs
### LOCAL SELF-GOVERNMENT UNITS

<table>
<thead>
<tr>
<th>Public buildings</th>
<th>No.</th>
<th>Investments (in EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>133</td>
<td>12,063,200</td>
</tr>
<tr>
<td>Kindergartens</td>
<td>152</td>
<td>13,151,915</td>
</tr>
<tr>
<td>Homes for children</td>
<td>62</td>
<td>9,857,997</td>
</tr>
<tr>
<td>Schools</td>
<td>502</td>
<td>153,915,930</td>
</tr>
<tr>
<td>Sport facilities</td>
<td>21</td>
<td>4,886,644</td>
</tr>
<tr>
<td>Other buildings</td>
<td>163</td>
<td>18,344,758</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td>1033</td>
<td><strong>212,220,444</strong></td>
</tr>
</tbody>
</table>

### GOVERNMENT

<table>
<thead>
<tr>
<th>Public buildings</th>
<th>No.</th>
<th>Investments (in EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health sector buildings (hospitals and clinics)</td>
<td>14</td>
<td>58,178,778</td>
</tr>
<tr>
<td>Buildings for social care (homes for children, rehabilitation and educational centers)</td>
<td>253</td>
<td>49,863,300</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td>267</td>
<td><strong>108,042,078</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1300</td>
<td><strong>320,262,522</strong></td>
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</table>
Economic and construction industry recovery

* use energy efficiency measures to create the proper environment for inciting investment cycles in construction sector
* create new employment in public and private sectors in multiple branches and industries
* directly create 20,000 vacancies in construction industry, equipment production and maintenance
* indirectly create additional 20,000 vacancies in other industries and additional employment induced by the development of new positions
* decrease in fixed public sector energy costs
* increase in usage of renewable energy sources
Thank you for attention!

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