Prof. Dr. Borislav Stojkov

RENEWABLE ENERGY IN SERBIA  
(The case of AP Vojvodina)

Kecskemet, October 2012
THE FUTURE OF ENERGY AND SPATIAL DEVELOPMENT OF SERBIA:

• SPATIAL DEVELOPMENT OF SERBIA AND MUTUAL INFLUENCES WITH ENERGY:
  - IN THE FUTURE-MORE INTENSIVE DEVELOPMENT AND INCREASED COMPETITIVENESS OF HER REGIONS (AGRICULTURE, INDUSTRY, TOURISM, ENERGY....)
  - SUSTAINABLE USE OF ENERGY RESOURCES
  - MORE EFFICIENT AND RATIONAL USE OF ENERGY (CONSTRUCTION INDUSTRY, INDUSTRY, TRANSPORT)
  - SHIFT TO RENEWABLES
  - PRUDENT INVESTMENT AND PRICE POLICIES

• ENERGY AND REGIONAL DEVELOPMENT:
  - INTER-DEPENDENCES OF ENERGY SYSTEM WITH OTHER DEVELOPMENT SYSTEMS (ECONOMY, ECOLOGY, SOCIAL)
  - HORIZONTAL COORDINATION BETWEEN STATE OFFICES AND MINISTRIES
  - VERTICAL COORDINATION (SPRS AS AN INSTRUMENT)
  - OBJECTIVE ANALYSES OF ECO-ECO RELATIONS AND SOCIAL IMPACTS
THE FUTURE OF ENERGY AND SPATIAL DEVELOPMENT OF SERBIA:

• OWNERSHIP IN ENERGY:
  - PRIVATIZATION: TO BE OR NOT TO BE
  - TENDENCIES IN SERBIA (ORIENTATION TO RUSSIA)
  - RESOURCES, TECHNICAL SYSTEM, OPERATION AND DISTRIBUTION - WHAT TO PRIVATIZE?
  - RENEWABLES AS FOREIGN CONCERN

• ENERGY PRICING-A KEY QUERY
  - ENERGY PRICES AS SOCIAL ISSUE WITH NO ECONOMY
  - LONG TERM CONSEQUENCES
  - FOREIGN INVESTORS TAKING THE SYSTEM OVER (THE END OF SOCIAL PRICING AND OF STATE ENERGY DISPOSAL)
  - RENEWABLES WITH NO CLEAR AND DEFINITE POLICIES AND LEGISLATIVE
  - NEGATIVE EXTERNALITIES (COSTS) NOT INCLUDED IN RENEWABLE ENERGY PRODUCTION PRICE
BASIC POLICIES:

• SPRS, ENERGY DVPT STRATEGY, PROGRAMS OF IMPLEM., NEW LAWS.

• ENERGY ASKS FOR LONG-TERM PLANNING AND PRUDENT ANALYSES OF MUTUAL IMPACTS WITH THE NATURE, BIODIVERSITY, ENVIRONMENT, ECONOMY, SOCIAL DVPT, ETC.

• BALANCED ROLE OF NON-RENEWABLE (NR) AND RENEWABLE (R) RESOURCES AND THEIR ENERGY CAPACITIES/CONTRIBUTIONS TO DEVELOPMENT?

• THE ROLE AND RIGHTS OF REGIONS AND LOCAL COMMUNITIES IN ENERGY POLICIES?
KEY DILEMMAS (1):

• FOSSIL ENERGY, CLIMATE CHANGES, THREATENED BIODIVERSITY // RENEWABLES AND THEIR AFFORDABILITY, LIMITS (FOOD PRODUCTION, ECOSYSTEMS- BIRDS, SOIL) AND PRIORITIES
• LIMITED CAPACITIES OF R-ENERGY RESOURCES, UNEVEN DISTRIBUTION OVER THE STATE TERRITORY
• THE ROLE OF DIFFERENT LOBBIES (NUCLEAR, COAL, HYDRO) WITH STRONG IMPACT TO SAVING THEIR POSITIONS- CONNECTIONS WITH GVMT BODIES
• THE PRICE OF ENERGY AS STRATEGIC INSTRUMENT FOR THE FUTURE (SOCIAL SUBVENTIONS OR ECONOMIC PAY-OFFS)
• R-ENERGY VS. NR-ENERGY: DIRECT AND INDIRECT COSTS AND EFFECTS (EU POLICIES?)
KEY DILEMMAS (2):

• THE RELATION BETWEEN ENERGY AND POLITICAL SYSTEM

• CENTRALIZED STATE AND MONOPOLY OF ENERGY SYSTEM VS. DECENTRALIZED STATE WITH NEW ROLE OF REGIONS AND LOCAL COMMUNITIES

• LOCAL AND REGIONAL LAND PROPERTIES AND TERRITORIAL CAPITAL FOR NETWORKING TO MORE EFFICIENTLY USE OF THEIR ENERGY RESOURCES (POSITIVE/NEGATIVE EXTERNALITIES TO LOCAL COMMUNITIES)

• THE NEW ROLE OF FOREIGN MONOPOLIES
THE CASE OF AP VOJVODINA

- THE REGIONAL DEVELOPMENT STRATEGIES OF APV
- ENERGY AS CRUCIAL HANDICAP FOR THE FUTURE
- OBJECTIVES:
  - DECREASING THE FINAL CONSUMPTION OF ENERGY
  - ENHANCING ENERGY EFFICIENCY
  - FUNCTIONAL USE OF R-RESOURCES
  - PROMOTION AND INCENTIVES TO R-RESOURCES (REGIONAL, LOCAL)
  - PARTICIPATION OF STAKEHOLDERS OF R-RESOURCES USE AND PROGRAMMING
APV R-ENERGY POLICIES

• R-ENERGY UP TO 20% IN 2021
• BIOMASS AS THE MOST IMPORTANT (20.500 TJ/A)
• PRODUCTION OF BIO-DIESEL AND ETHANOL (HIGH PRODUCTION COSTS?)
• SOLID WASTE (HEATING)
• GEOTHERMAL ENERGY FOR BALNEOLOGY (LAND OWNERSHIP PROBLEMS, QUANTITY- 54 MW TOTAL)
• WIND ENERGY CLASS 3, WITH 5.7% OF PRESENT ELECTRO-ENERGY IF REALIZED (COMPLICATED PROCEDURES, BIRDS AND SOIL PROTECTION)
• SOLAR ENERGY (267 SUNNY DAYS- 565 GW/H/A, SOIL PROBLEM)
• HYDRO POTENTIAL (POSSIBLY 13 PLANTS- 20.2 MW TOTAL, TECHNO-ECOLOGICAL PROBLEM)
<table>
<thead>
<tr>
<th>RES</th>
<th>Total Potential (k ten/ year)</th>
<th>Thermal Energy (TJ/year)</th>
<th>Electric Energy (GWh/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid biomass (1/3 total amount)</td>
<td>768</td>
<td>35000</td>
<td>360</td>
</tr>
<tr>
<td>Biogas</td>
<td>3</td>
<td>90</td>
<td>20</td>
</tr>
<tr>
<td>Biofuel</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind (300 MW)</td>
<td>65</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>Geothermal</td>
<td>22</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>158</td>
<td>6600</td>
<td>56</td>
</tr>
<tr>
<td>Small Hydro Potential</td>
<td>77.7</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Large Hydro Potential</td>
<td>85</td>
<td>990</td>
<td></td>
</tr>
<tr>
<td>Solar Energy</td>
<td>34</td>
<td>1400</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1293</strong></td>
<td><strong>44890</strong></td>
<td><strong>2266</strong></td>
</tr>
</tbody>
</table>

Possible Electric Energy Production (TJ/year)

Possible Thermal Energy Production (TJ/year)
PROBLEMS:

• WHO PRODUCES R-ENERGY (FOREIGN PARTNERS + STATE SYSTEM RELATIONS)?
• WHERE R-ENERGY GOES (ABROAD WITH HIGHER PRICE OR STATE SYSTEM)?
• WHAT WOULD BE INCENTIVES AND REGULATION FOR R-ENERGY?
• THE RELATION BETWEEN R-ENERGY AND REGIONAL (LOCAL) DEVELOPMENT (VOJVODINA’S AUTONOMY IN ENERGY)?
• ECONOMIC AND SOCIAL COSTS AND BENEFITS OF R-ENERGY (REGIONAL, LOCAL)?
• INSTRUMENTS FOR IMPLEMENTING R-ENERGY POLICIES (LEGAL, ADMINISTRATIVE, FINANCIAL, PPP, EDUCATIVE)?
THANK YOU FOR ATTENTION