

## Biofuels in Croatia

### Overview of Biofuels in Croatia

Croatia has a relatively low level of energy consumption if compared to other countries of the region, and is accounting for 0,5% of final energy consumption in EU-28, with approx. 1,4 toe/capita.

Lowlands and fertile plains constitute approx. 55% of the territory of Croatia, yet mainly in the northern/north-eastern part of the country, which is part of the Pannonian plain with mostly continental climate. Dry Mediterranean climate characterizes coastal areas and the islands, where Karst topography is predominant (about 45% of the territory). The Adriatic coast is one of the more indented coastlines of the Mediterranean basin, with more than 1200 islands and islets, of which only 47 are permanently inhabited. Owing to its geomorphological characteristic, Croatia is one of the richest countries in Europe in terms of biodiversity. However, the geographical variety, the growing urbanization (56%) and the large portions of secluded territory as well as radical seasonal fluctuations in the number of inhabitants and tourists (14 million in 2013) pose additional challenges to the energy system, particularly on coastal areas.

Similarly to other countries of the region that have high capacities in hydro (which is predominant in terms of installed capacities and production, with approx. 700 ktoes) and extensive forestry resources combined with low density, the second main RES is represented by biomass, which however is mostly used for heating purposes at household level (approx. 320 ktoe). Unlike some of the neighboring countries (Slovenia, Hungary), biogas is less developed in Croatia. Wind contributes with approx. 45ktoe to the energy mix (growing trend), while municipal solid waste is generally landfilled with no energy recovery.

Renewables in transport are supported through mandatory blending targets and financial support (subsidies and taxation). Currently, the minimum mandatory blending share for biofuels is set slightly above 2%; domestic production relies almost entirely on biodiesel capacities. Nonetheless, and notwithstanding a remarkable positive trend in the overall share of renewables in the energy mix (18% in 2013), RES-T and particularly the production of biodiesel present a declining trend in recent years (-10% in 2013 if compared to 2012; -12% in biodiesel production). This owes to several factors, which include the well-known uncertainties that have destabilized the European biofuels market in recent years, but are mainly related to reiterated reduction of subsidies. Current consumption of biofuels in Croatia is approx. 30 ktoe, entirely fulfilled with biodiesel.



### Country information

Croatia	
Population	4,232,800
GDP (per capita)	\$13,475.3
Final Energy Consumption (Mtoe)	6,2
Final Energy Consumption in Transport (Mtoe)	2,0
Final Energy Consumption in Transport Share	32,2%
Biofuels share in Transport Fuels	1,5%
Fuel-Mix	Oil, Gas, Biofuels

## Biofuels policy, regulations, market development

Croatia accession to EU being the most recent (July 2013), relevant efforts to aligning national legislation to the *acquis communautaire* have been made during the 10 year accession process, also concerning the chapters related to Energy and Environment (probably the most critical one initially, and the one where most progress has been made). Therefore, Croatia is bound to fully transpose EU Directives which, with reference to RES and Biofuels, has occurred through the Energy Law and other relevant laws and by-laws, yet with occasional delays and inconsistencies.

Promotion of RES in general is much highlighted in the policy framework on energy, and in particular in the Energy Law of 2012 and subsequent amendments; RES targets are defined in the Energy Strategy (2009, with subsequent adjustments, particularly concerning RES-T). Besides other regulatory acts, biofuels are regulated by the Law on Biofuels in Transport of 2009 (with subsequent amendments, the latest dating 2014). Other legislative acts concerning biofuels include: Act on Biofuels for Transport (NN 65/09, last amended in 2014); Quota Obligation Rules (NN 42/10); Environmental Penalty Decree (NN 125/11); Regulation on biofuels production stimulation (NN 1/14); Ordinance on ways and conditions for implementation of sustainability requirements in biofuel production and usage (NN 83/13), as well as other provisions concerning incentives and excise exemption.

## Advanced biofuels demonstration and R&D projects

Quite some research has been done in recent years focusing on biomass potentials of the Country, mainly in forestry, but also in agriculture with some focus on unused land. This owes to the emphasis made on RES-T as well as on the demand for biomass from elsewhere in the EU (Croatia as well as other countries of the region are major wood and pellets exporters, with up to 70% production sold abroad). R&I capacities are good, yet proportionate to the population and size (one major university, a couple of research institutes). The Country has a good network of renewable energy agencies which efficiently promote RES in regions.

Deployment of biofuels has been initially driven by the boost in the demand for conventional biofuels. **Envien group** has capacities in Vukovar (Biodizel Vukovar d.o.o.), for the production of 35.000 t/y biodiesel from rapeseed oil. Reportedly, overall production capacity in the country is about 55.000 t/y, yet actual production is approx. 33.000 t/y, declining in recent years owing to fading subsidies. Another project that is apparently progressing is the construction of a **plant in the port of Ploče** with an annual production capacity of 100,000 t of biodiesel from UCO and non-edible animal fat. Construction permits have been released in 2015 and financial support has been requested to EIB.

## Biofuels ministries, organisations and agencies in Croatia

Agency for Regional Development of the Republic of Croatia  
 Association BIOM  
 Center for Monitoring Business Activities in the Energy Sector  
 Croatian Rural Development Network  
 Environmental Protection and Energy Efficiency Fund  
 International Centre for Sustainable Development of Energy, Water and Environment Systems (SDEWES Centre)  
 Ministry of Agriculture  
 Ministry of Economy  
 Ministry of Environmental and Natural Protection  
 Agency for Regional Development of the Republic of Croatia-ARD

## Key biofuels industry and research stakeholders

Institute Ruđer Bošković-IRB  
 National Energy Agency-Institut Hrvoje Požar-EIHP  
 Hrast Ltd. regional development agency