European Environment Agency

Country profile – Croatia

The section 'Key climate- and energy-related data' was prepared by the EEA. It includes the latest data available as of 31 July 2014

The section 'Climate and energy policy framework' was prepared by eclareon and Ecologic Institute, Germany. It includes the latest information on national policies and measures available as of 31 May 2014.

For methodological details and other country profiles, see www.eea.europa.eu/themes/climate/country-profiles.

Key climate- and energy-related data — Croatia

Key data on GHG emissions	2005	2011	2012	2013	EU 2012
Total GHG emissions (UNFCCC, Kyoto Protocol) (Mt CO_2-eq.)	30.7	28.5	26.4	24.5	4 544.2
GHG per capita (t CO_2-eq./cap.)	7.1	6.7	6.2	5.8	9.0
GHG per GDP (g CO_2-eq./PPS in EUR)	539	439	395	368	350
Share of GHG emissions in total EU-28 emissions (%)	0.6 %	0.6 %	0.6 %	0.5 %	100 %
EU ETS verified emissions (Mt CO_2-eq.)	n.a.	n.a.	n.a.	8.5	1 848.6
Share of EU ETS emissions in total emissions (%)	n.a.	n.a.	n.a.	35 %	41 %
ETS emissions vs allowances (free, auctioned, sold) (%)	n.a.	n.a.	n.a.	+ 60.8 %	– 14.1 %
Share of CERs & ERUs in surrendered allowances (%)	n.a.	n.a.	n.a.	n.a.	26.4 %
Non-ETS (ESD) emissions, adjusted to 2013–2020 scope (Mt CO_2-eq.)	18.4	18.7	17.2	15.9	2 566.6
Key data on renewable energy	**2005**	**2010**	**2011**	**2012**	**EU 2012**
Share of renewable energy in gross FEC (%)			15.4 %	16.8 %	14.1 %
() = including all biofuels consumed in transport	(12.8 %)	(14.3 %)			
Share of renewable energy for electricity (%)	32.8 %	34.2 %	34.2 %	35.5 %	23.5 %
Share of renewable energy for heating and cooling (%)	10.8 %	13.0 %	15.6 %	18.3 %	15.6 %
Share of renewable energy for transport (%)			0.4 %	0.4 %	5.1 %
() = including all biofuels consumed (%)	(0.4 %)	(0.5 %)			
Key data on energy consumption	**2005**	**2010**	**2011**	**2012**	**EU 2012**
Primary energy consumption (Mtoe)	8.2	8.0	7.9	7.6	1 584.8
Primary energy consumption per capita (Mtoe/cap.)	1.9	1.9	1.8	1.8	3.1
Final energy consumption (Mtoe)	6.3	6.3	6.2	5.9	1 104.5
Final energy consumption per capita (Mtoe/cap.)	1.5	1.5	1.4	1.4	2.2
Efficiency of conventional thermal electricity and heat production (%)	52.7 %	57.0 %	56.4 %	56.0 %	50.0 %
Energy consumption per dwelling by end use	**2005**	**2009**	**2010**	**2011**	**EU 2011**
Total energy consumption per dwelling (toe/dwelling)	1.29	1.18	1.15	1.17	1.42
Space heating and cooling (toe/dwelling)	0.79	0.73	0.68	0.70	0.96
Water heating (toe/dwelling)	0.14	0.12	0.13	0.13	0.18
Cooking (toe/dwelling)	0.16	0.14	0.15	0.16	0.08
Electricity (lighting, appliances) (toe/dwelling)	0.20	0.19	0.19	0.18	0.20

Progress towards GHG targets (under the Effort Sharing Decision, i.e. non-ETS emissions)

2013 ESD target (% vs base year)	+ 3.9 %	2020 ESD target (% vs base year)	+ 11.0 %
2013 ESD emissions (% vs base year)	– 8.7 %	2020 ESD projections WEM (% vs base year)	– 5.9 %
		2020 ESD projections WAM (% vs base year)	n.a.

Based on approximated emission estimates for 2013, emissions covered by the Effort Sharing Decision (ESD) (i.e. in the sectors which are not covered by the EU ETS) are expected to be below the annual ESD target in 2013. Projections also indicate that 2020 ESD emissions are expected to be below the 2020 ESD target, with the current existing measures.

Progress towards renewable energy targets

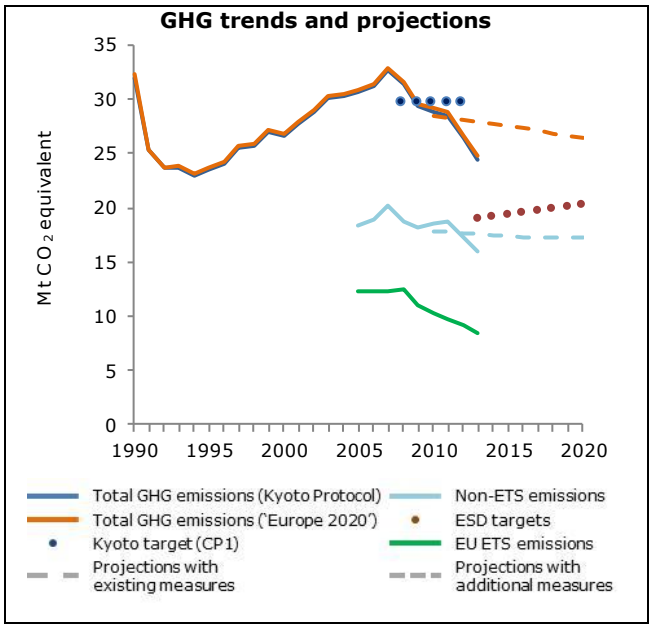
2012 RES share in gross final energy consumption (%)	16.8 %	2011–2012 indicative share from RES Directive (%)	14.3%
2020 RES target	20.1 %	2012 expected share from NREAP (%)	15.1%

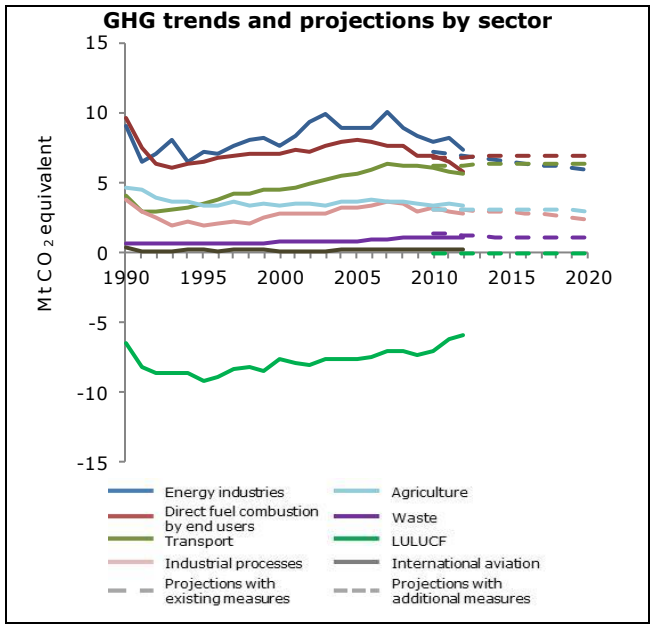
The average share of renewable sources in gross final energy consumption for 2011–2012 was 16.1% (1.0 Mtoe), which is higher than the indicative RED target for 2011–2012 (14.1 %). At the same time, the share of renewables in 2012 (16.8 %) is higher than the expected 2012 NREAP target (15.1 %). Over the period 2005–2012 the observed average annual growth rate in renewable energy consumption amounted to 2.9%. In order to reach its 2020 NREAP target, Croatia needs an average annual growth rate of 4.5% in the run-up to 2020. In absolute terms, this is equivalent to 2.3 times its cumulative effort so far.

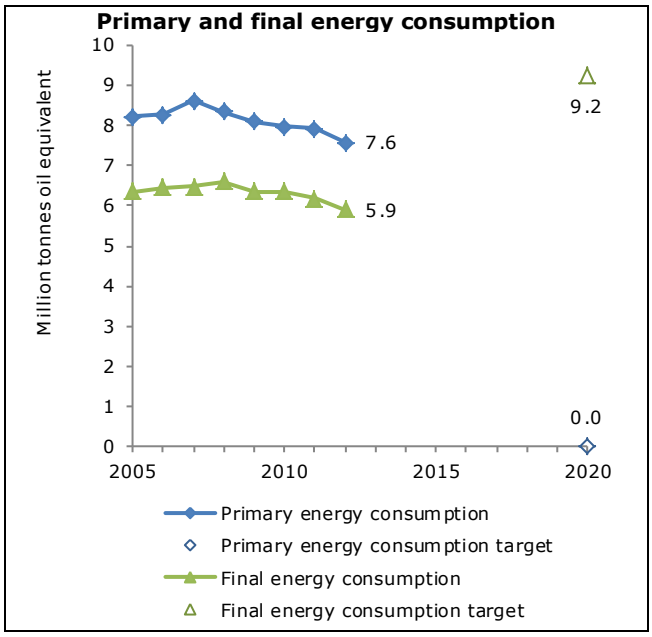
Progress towards energy efficiency targets

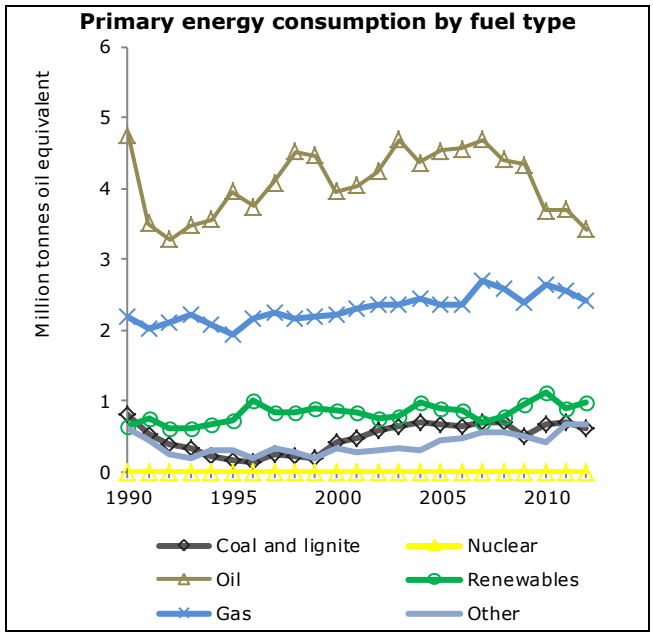
Primary energy consumption:		Final energy consumption:	
2005–2012 average annual change	-1.1 %	2005–2012 average annual change	-1.0 %
2012–2020 average annual change to target	n.a.	2012–2020 average annual change to target	5.7 %

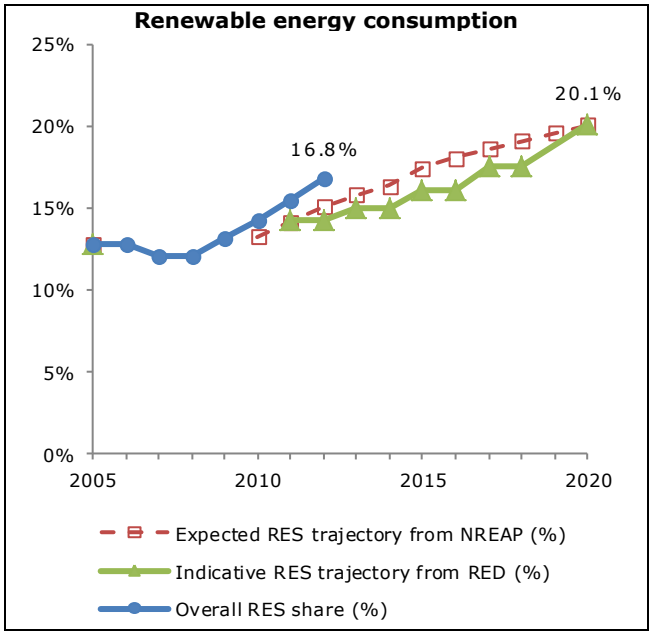
Croatia has a positive target on final energy consumption for 2020, compared to 2005. It can therefore focus on stabilising its energy consumption. Particular attention needs to be paid to the transport sector where energy consumption increased by more than 12 % during the period 2005–2012.

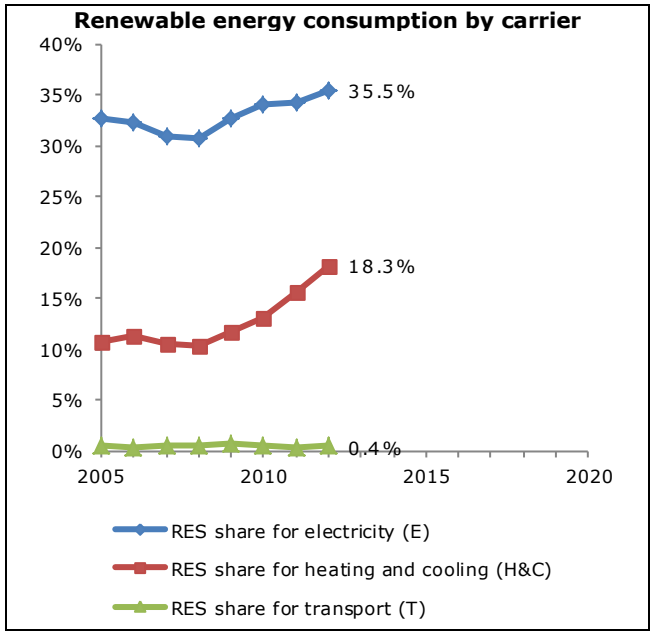

GHG trends and projections
Mt CO2 equivalent
Total GHG emissions (Kyoto Protocol)
Total GHG emissions ('Europe 2020')
Kyoto target (CP1)
Projections with existing measures
Non-ETS emissions
ESD targets
EU ETS emissions
Projections with additional measures


GHG trends and projections by sector
Mt CO2 equivalent
Energy industries
Direct fuel combustion by end users
Transport
Industrial processes
Projections with existing measures
Agriculture
Waste
LULUCF
International aviation
Projections with additional measures


Primary and final energy consumption
Million tonnes oil equivalent
7.6
5.9
9.2
0.0
Primary energy consumption
Primary energy consumption target
Final energy consumption
Final energy consumption target


Primary energy consumption by fuel type
Million tonnes oil equivalent
Coal and lignite
Oil
Gas
Nuclear
Renewables
Other


Renewable energy consumption
16.8%
20.1%
Expected RES trajectory from NREAP (%)
Indicative RES trajectory from RED (%)
Overall RES share (%)


Renewable energy consumption by carrier
35.5%
18.3%
0.4%
RES share for electricity (E)
RES share for heating and cooling (H&C)
RES share for transport (T)

Climate and energy policy framework

Challenges and opportunities
Energy supply, energy use and transport contribute similar shares of emissions to Croatia's total and thus must each be addressed with dedicated policy strategies. Emissions in the energy supply sector slightly increased again in 2011. Progress in promoting renewables has been moderate and support has recently been strictly capped, in particular for photovoltaic systems. Moreover, energy efficiency improvements have been slow in the housing sector, increasing by only 4 % from 1995 to 2010 (Odyssee, 2012). Based on 2020 projections forecasting EUR 8–10 billion in investments in energy-efficient buildings, greater biomass utilisation, the installation of solar thermal systems and wind energy, approximately 14 500 new jobs could be expected to be directly created, in addition to 65 000 indirect or induced jobs. Investing in these measures has the potential to help reduce Croatia's unemployment, while also increasing energy security via reduced oil and gas imports.
Emissions in the transport sector have risen nearly 44 % between 1990 and 2011. Moreover, transport remains a challenge due to the large volume of traffic that goes through Croatia without originating or terminating there, and due to increasing personal car ownership and the associated greenhouse gas (GHG) emissions. Meanwhile, fuel taxes remain among the lowest in the EU. Increasing environmental taxation in the transport sector could strengthen incentives to purchase more fuel-efficient vehicles and encourage vehicle operators to conserve fuel, thereby reducing oil imports as well as 'fuel tourism' and associated GHG emissions.

Climate and energy strategies
The lately amended Act on the Protection of the Air (OG 130/2011, 47/2014) and the Framework for Low-Emission Development Strategy for Croatia from 2013 form the centrepiece of a long-term strategy (until 2050) to reduce GHG emissions in Croatia. In the Economic Programme from 2013 the government commits itself to promoting investments in energy efficiency, renewables and other low-emission technologies. Moreover, the Plan for the Protection of the Air, the Ozone Layer and Climate Change Mitigation determines the objectives, priorities and measures for implementation from 2013–2017.
The latest Energy Development Strategy of Croatia was adopted in 2009 (Government of the Republic of Croatia, 2009). The primary objectives outlined in the Strategy are increasing energy security, securing a competitive economy and promoting environmental sustainability. The Strategy sets targets to reduce final energy consumption by 10 % compared to average consumption from 2001–2005 and increase renewables as a share of final energy consumption to 20 % in 2020, including 35 % of electricity production, 10 % in transport and 20 % in heating and cooling.

Renewable energy
Renewables in Croatia are dominated by hydro and bioenergy, with other renewables still insignificant. Progress on renewables is moderate, but the share of renewable energy in final energy consumption and electricity has slowly increased. Electricity from renewables is mainly promoted through a feed-in tariff (FIT), which has been in place for over 10 years and covers all technologies on a differentiated basis. In addition, loans are provided for investments into renewables through the Croatian Bank for Reconstruction and Development (HBOR). The fee paid by final consumers to finance the FIT was recently raised. The National Action Plan for RES (NAP OIE) adopted in October 2013 foresees that installed capacities of wind and solar should not increase from 2015 to 2020, while planning a small growth in hydro, geothermal and biomass. Croatia is expected to adopt a Renewable Energy Sources Act, originally planned for the end of 2013, that would summarise the hitherto isolated laws and to provide a more specific regulation of this sector than in the Energy Act. Renewable heating and cooling is not promoted by the state.

Energy efficiency
Croatian **energy taxes** are in line with the EU-set minimum standards. Exemptions apply to natural gas for households and as motor fuel, and electricity used for chemical reduction and in electrolytic and metallurgical processes as well as to electricity for households. In addition, Croatia applies reduced VAT rates to certain energy products (Ministry of Finance, 2013). In 2007, the government introduced a tax on CO_2 emissions for all stationary sources emitting more than 30 tCO_2 (OG 73/2007, 48/2009).
In **industry**, the main incentive for energy efficiency improvements comes from the Fund for Environment Protection and Energy Efficiency (FZOEU), which provides funding for energy audits and investments in energy efficiency measures. Energy audits are mandatory for large energy consumers (over 10 000 MWh per year), and voluntary for all other companies (OG 152/2008, 55/2012).
Croatia has set a target for **cogeneration of electricity and heat** of 4 % of final energy consumption, with the largest contribution expected from new industrial cogeneration (OG 33/2007, 8/2011). Cogeneration is mainly encouraged through the FIT scheme also applicable to renewables.
In the **building** sector, the Law on Spatial Planning and Construction (NN 76/2007) was replaced on 1 January 2014 by three new laws, namely the Law on Construction (NN 153/2013), the Law on Spatial Planning (NN 154/2013) and the Law on Building Inspection (NN 153/2013), requiring new buildings to undergo energy audits and introducing a 5- to 10-year window for owners of a newly constructed building to insulate the building exterior. Financial support for investments into energy-efficient products and energy-efficient renovation of buildings is provided through the FZOEU, and is mainly financed through revenues from environmental taxation. The Fund publishes calls on a yearly basis depending on the amount of available funds. In addition, the government adopted the Programme for Energy Renovation of Buildings in the Public Sector for the years 2013 and 2014, which is expected to result in around 200 tenders for energy efficiency renovations of public buildings across the country, amounting to approximately HRK 400 million (EUR 52.4 million) and GHG emission reductions of up to 20 500 tCO_2 equivalent per year.

Transport
Croatia levies a registration tax on vehicles, based on market value. Additionally, an ownership tax on passenger cars is in place, based on the engine power and the age of the vehicle. Taxes on petrol and diesel are among the lowest in the EU. In addition, Croatia levies a special registration duty on cars for their CO_2 emissions. If the vehicle emits less than 120 g CO_2/km, taxes decrease significantly, while those with emissions above 130 g CO_2/km are subject to a higher tax (OG 15/2013, 108/2013). Grants are provided for exchanging highly polluting vehicles for new, cleaner

ones. Croatia is also planning to require the buyers of public transport vehicles in public procurement to take into consideration the energy consumption and the environmental impacts of the vehicles to be purchased.
The Act on Biofuels for Transport sets a minimum biofuels content requirement of 1.58 % in 2012 that will rise to 10.05 % by 2020. Moreover, Croatia gives a cash incentive for biofuels producers in the form of payments per litre of biofuels produced and placed on the Croatian market.
In the past 20 years, highways have been given priority over other means of transportation; this has left railways and maritime transport fairly neglected. However, the government foresees investments in railroads, as well as in river transportation in their Strategic Plan of the Ministry of Maritime Affairs, Transport and Infrastructure for the period 2014–2016. Moreover, Croatia has undertaken a number of initiatives to increase the attractiveness of rail transport.

Agriculture
From 1990 to 2010, GHG emissions dropped in the agricultural sector mainly as a result of the broader Balkan conflict and due to optimisation of production processes and techniques. However, GHG emissions are projected to increase by 2020, due to an expected increase of agricultural land and associated mineral fertiliser outputs, as well as increased animal breeding. Some measures are in place to reduce GHG emissions from agriculture, such as a prohibition on burning of agricultural waste and the co-financing of agro-environmental measures. In addition, the Croatian state is promoting the objectives of its agricultural climate policies through the HBOR, which supports measures that aim to protect the environment (Ministry of Environmental and Nature Protection, 2012). In January 2014, the draft Rural Development Programme 2014–2020 was published for a public discussion and is to be adopted in May 2014. It foresees the promotion of new technologies, which should reduce GHG emissions and the usage of ammonia in the agricultural sector.

Waste
Croatia's waste policies are defined in the Waste Management Strategy and Waste Management Plan, and are based on the three principles of avoidance, evaluation and deposition. A focus is on landfill management and the reduction of GHG emissions through landfill gas capture and use. Moreover, Croatia promotes the thermal utilisation of biodegradable waste. The Sustainable Waste Management Act (OG 94/13) introduced separated waste collection for households, the regulation of bulky waste and fines for non-compliance. Currently, 92 % of municipal waste in Croatia is thrown unsorted into a single bin.

Land use, land-use change and forestry
Croatia has a long tradition of forest management with a comprehensive, vertically structured, national system for monitoring, data collection and reporting on the condition and activities in the forestry sector. The Croatian government has adopted an ambitious plan to achieve 100 % sustainable forest management of state-owned forests. The Forest Act and the Forest Management Area Plan from 2006 set out the rules for protection, use and management of forests and forest land. A Payment for Ecosystem Services scheme for the forestry sector was implemented in 1991 (Vuletic et al., 2010).

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