

# PRODUCTION AND PROCESSING OF HYDROCARBONS IN CROATIA (2000-2013)

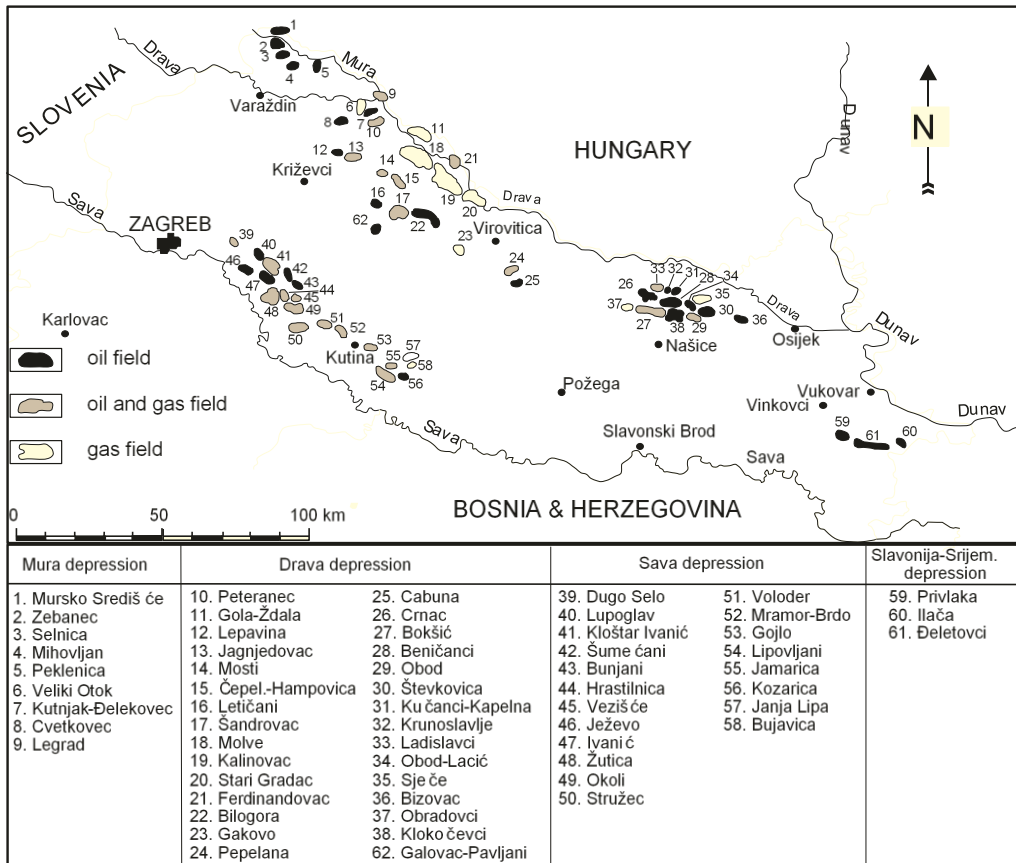
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# General facts



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The Croatian hydrocarbon fields are located in two hydrocarbon geological regional systems:

(a) Croatian part of the Pannonian Basin System (CPBS; **Fig. 1**)

(b) Croatian Northern Adriatic part of the Po Depression (CNAP; **Fig. 2**)

**Fig. 1: Oil and gas fields in Croatian part of Pannonian Basin System (Velić, 2007)**

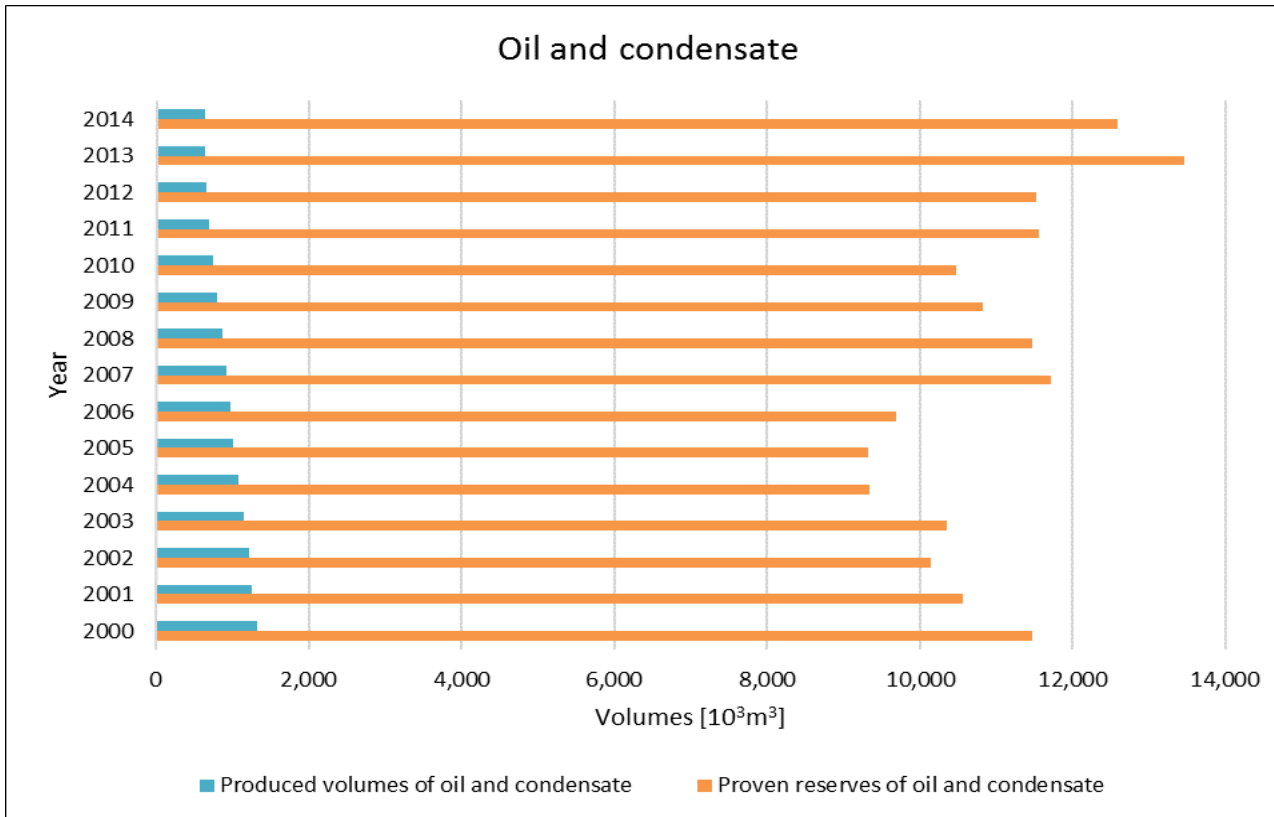


*Fig. 2: Gas fields in Adriatic offshore (Velić, 2007)*

# . Oil and condensate



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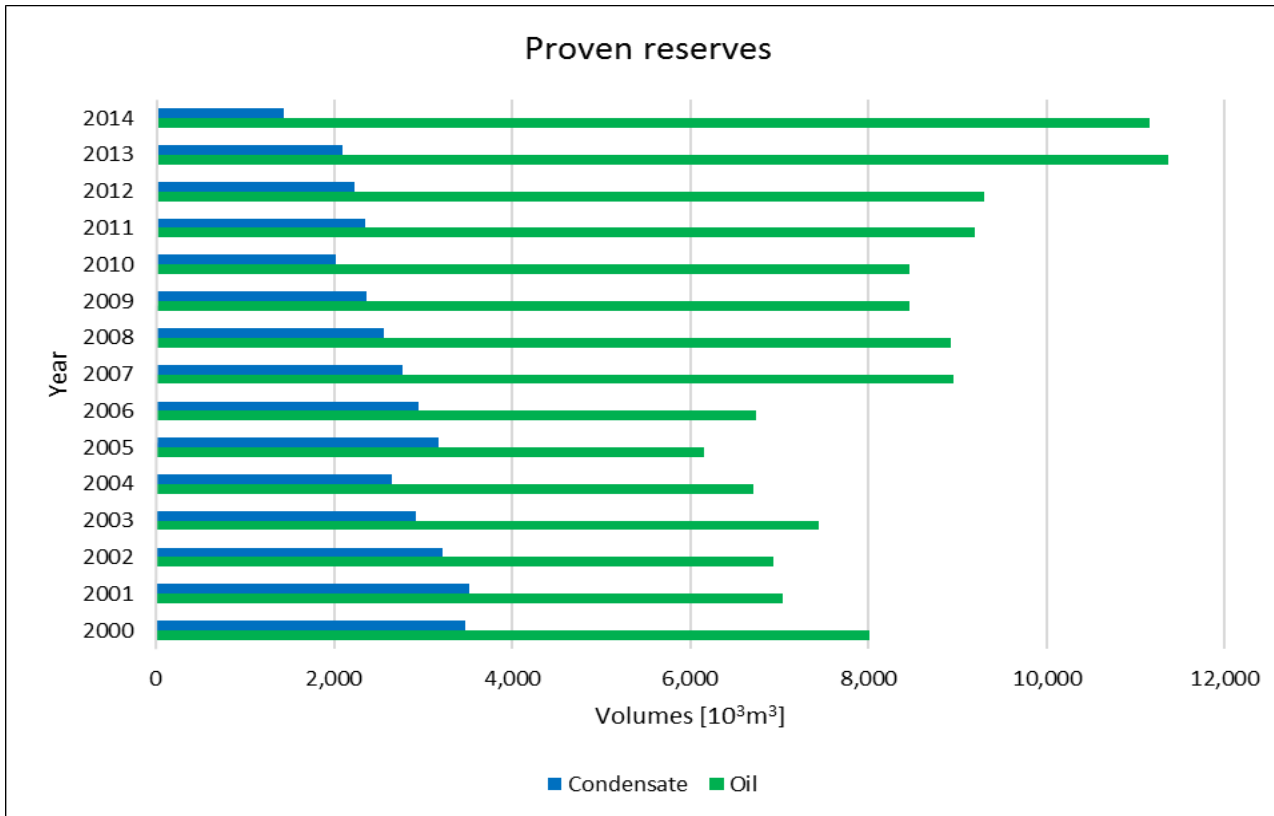


The ratio between production volumes of oil and condensate vs. their proven quantities is given on **Fig. 3** as annual report (2000-

It is clear that proven reserves had been slightly increased, when production declined.

**Fig. 3:** Proven and produced volumes of oil and condensate

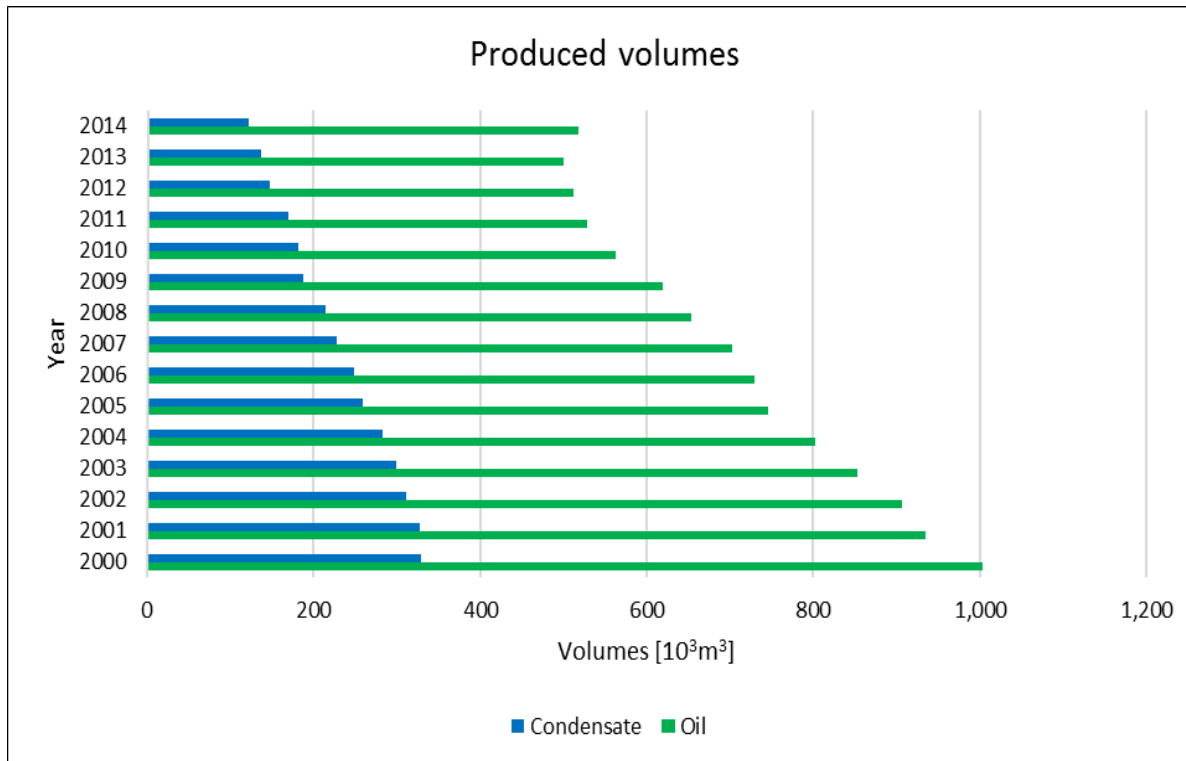
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Oil vs. condensate proven reserves are given on **Fig. 4**

It is clear trend of oil domination but also increasing oil/condensate ration from almost 2/1 to more than 6/1.

**Fig. 4:** Proven reserves of oil and condensate (2000-2014)



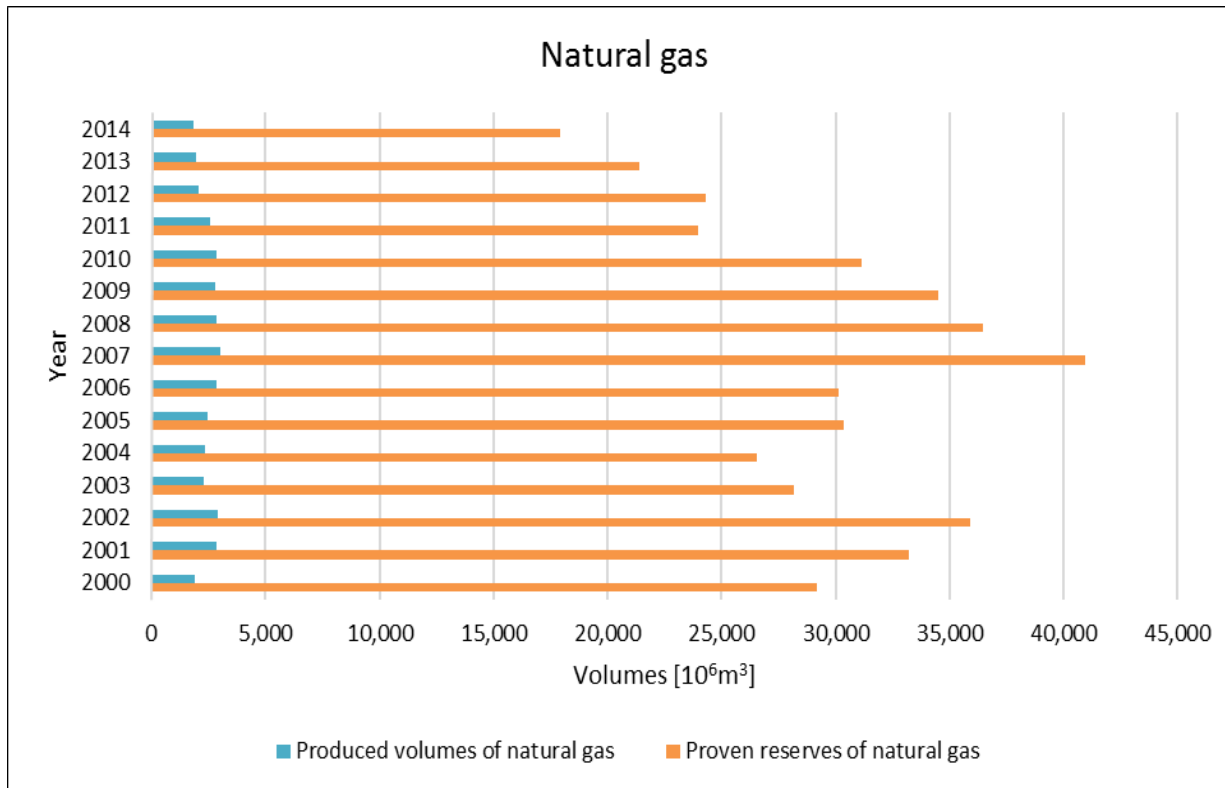
However (Fig. 5) does not follow such trend because production ratio oil/condensate remained almost same about /1 through entire period.

Fig. 5 Produced volumes of oil and codensate (2000-2014)

# . Natural gas



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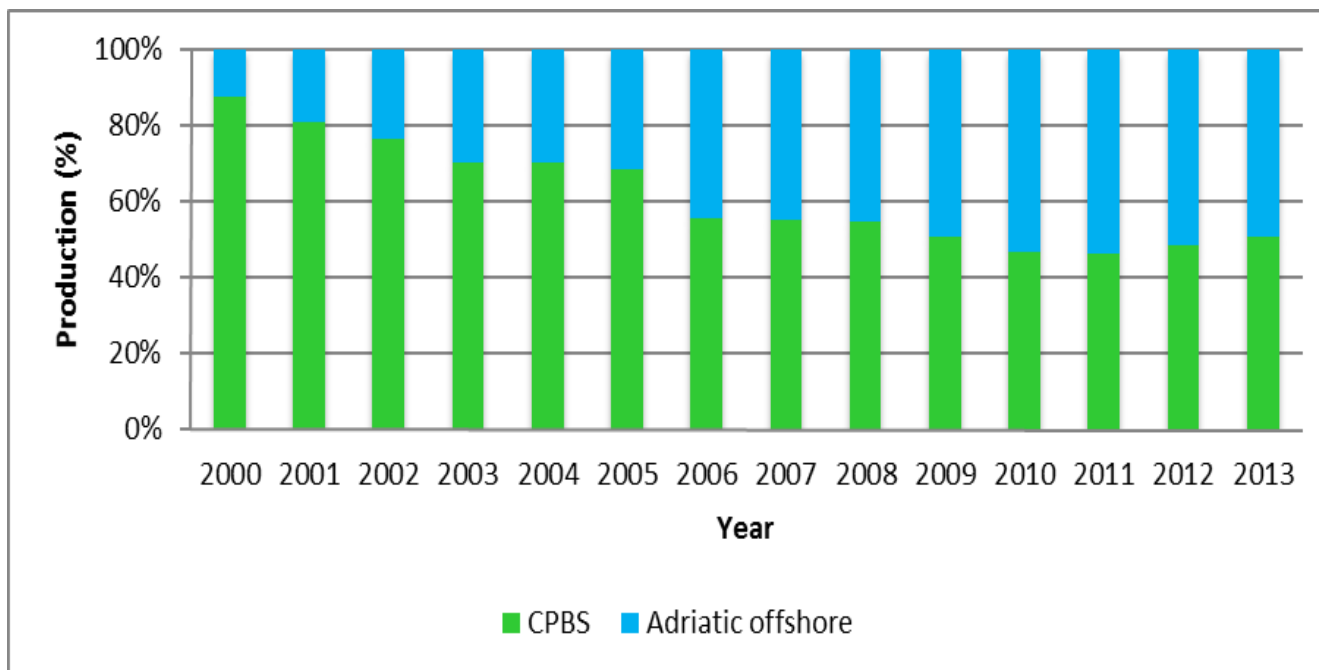


The ration between gas reserves and production (**Fig. 6**) is constantly declined to about 10/1.

**Fig. 6:** Proven reserves and produced volumes of natural gas 2000–2014



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It is visible (**Fig. 7**) drastical change in gas production ration between 2000 (domination of CPBS) to 2013 (about 50:50 between CPBS and CNAP).

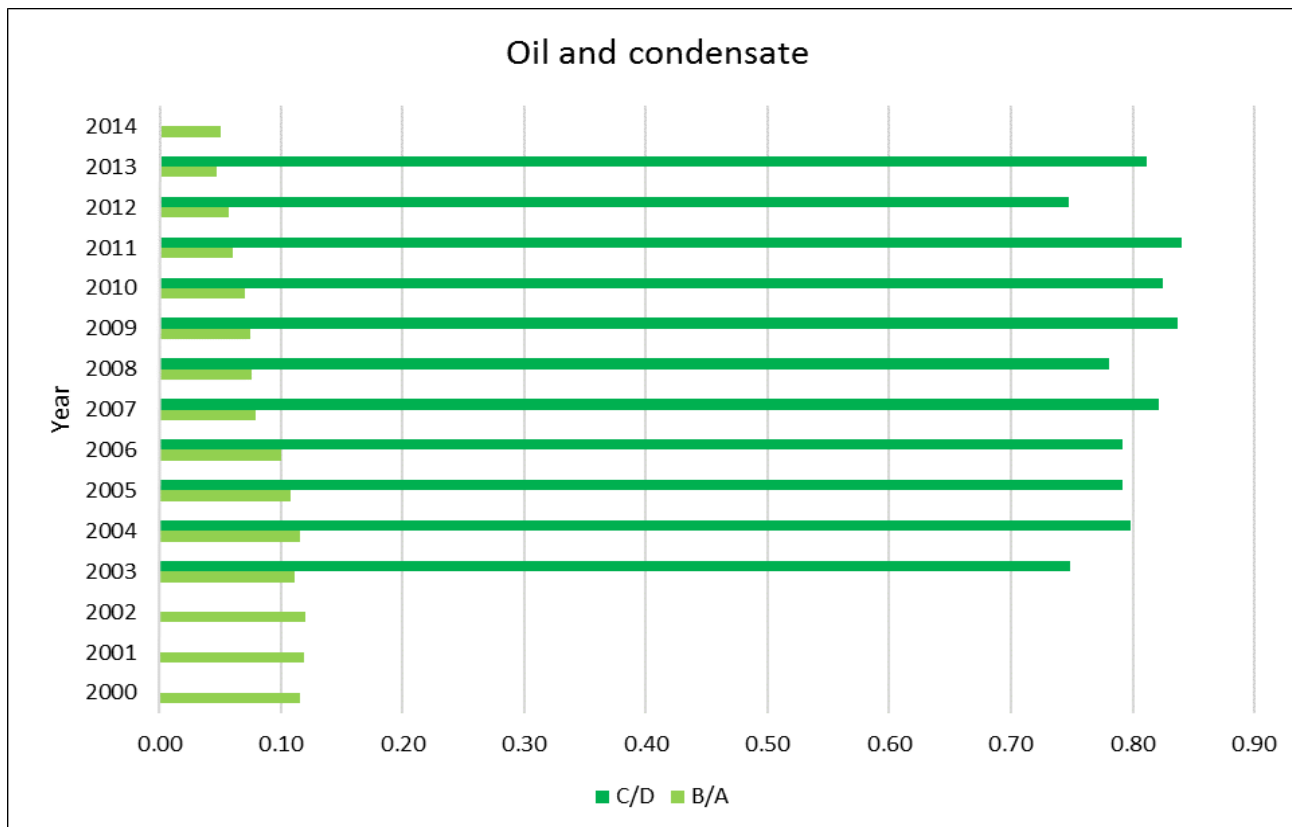
**Fig. 7** Ratio of natural gas recovered in CPBS and CNAP from 2000 to 2013 (*Kišić, 2015*)



# . Domestic hydrocarbons vs. import in Croatia

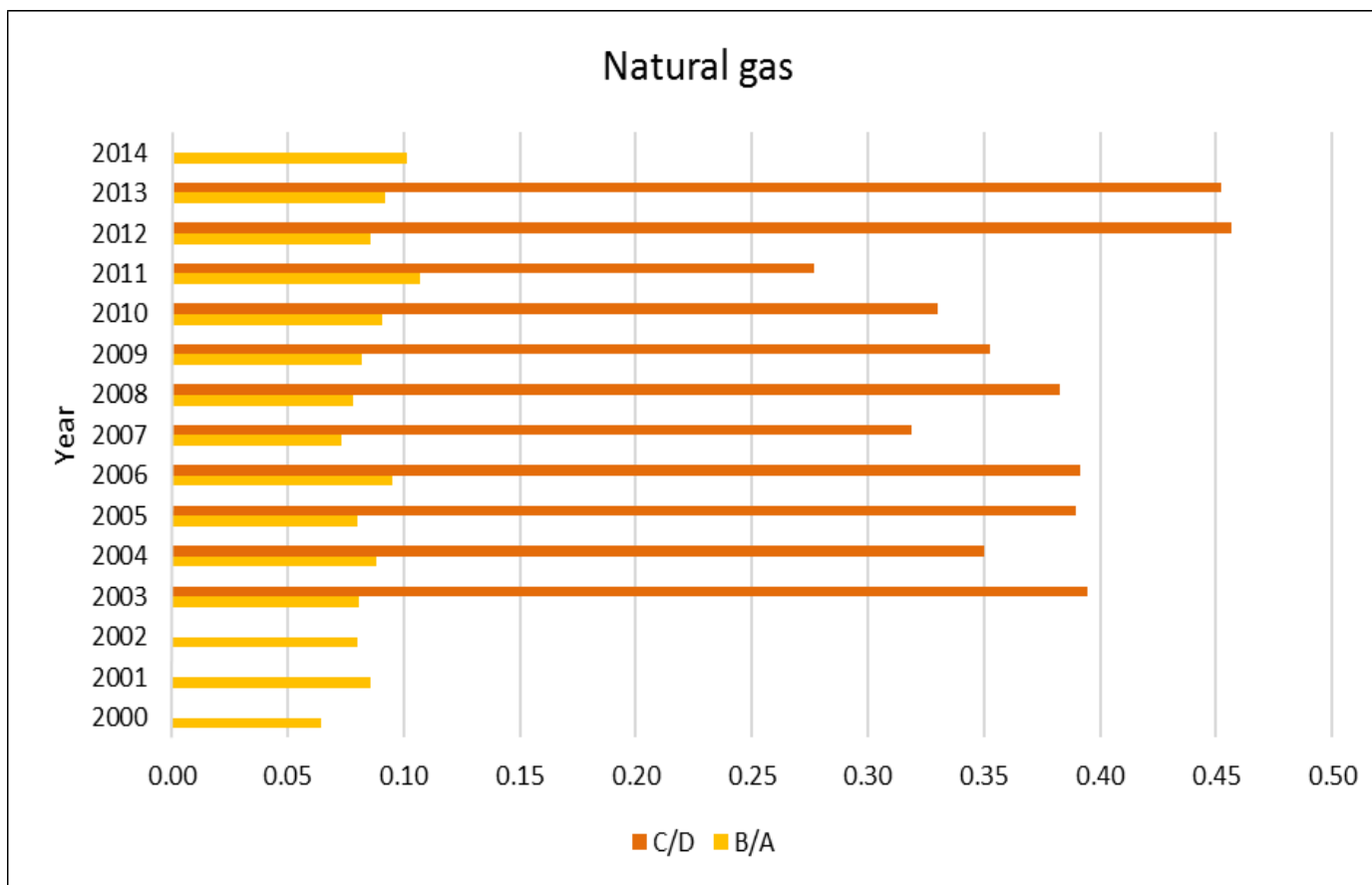


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Also production declines import remains almost constant (**Fig. 8**)

**Fig. 8:** Produced vs. Proven reserves of oil and condensate(B/A) and imported volumes vs. total consumption of crude oil (C/D) from 2000 to 2014



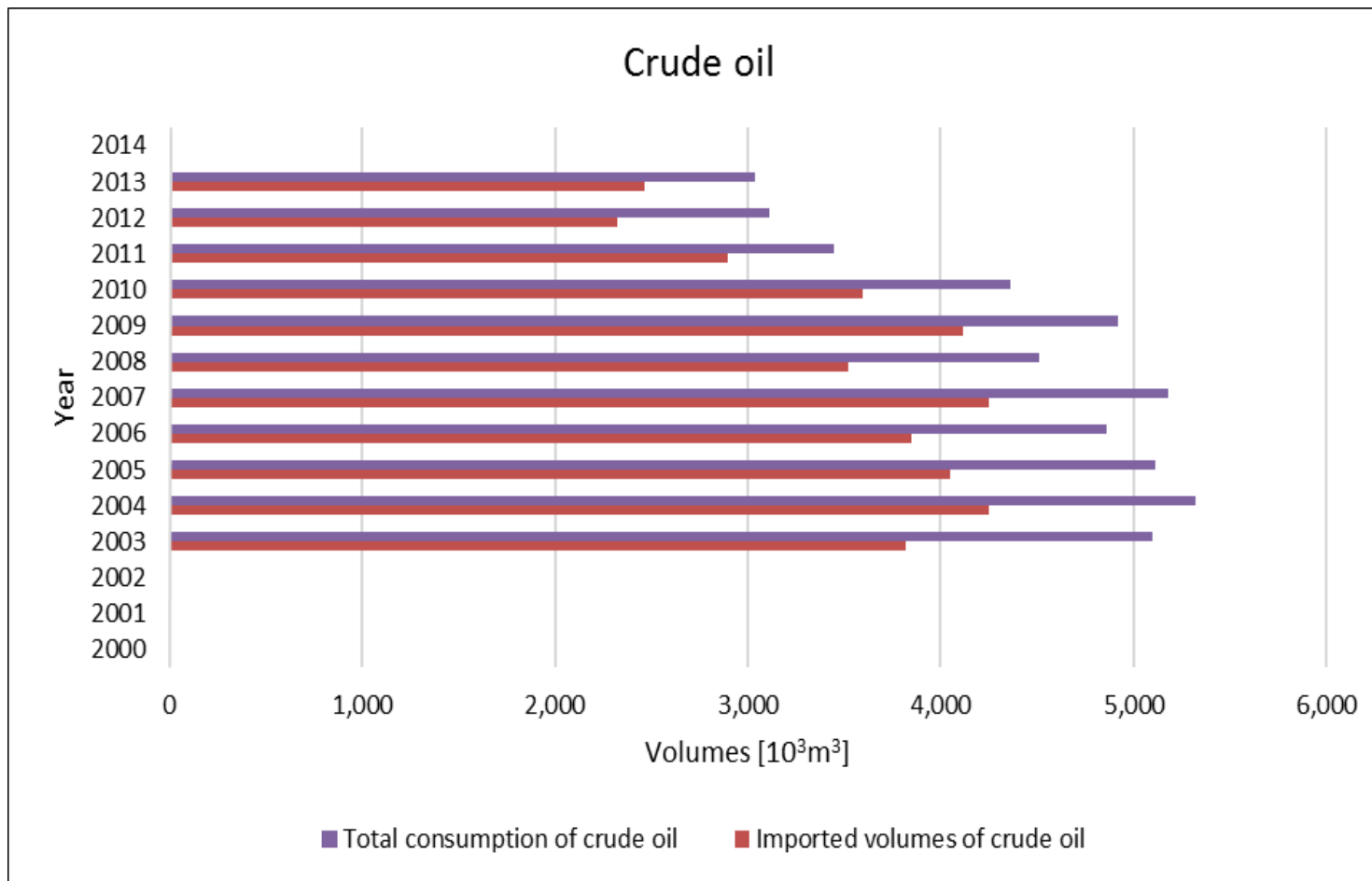
Regarding gas – also production and import grow (**Fig.**

**Fig. 9:** Produced vs. proven reserves of gas (B/A) and imported volumes vs. total consumption of gas (C/D) from 2000 to 2014



## . Import vs. consumption in Croatia

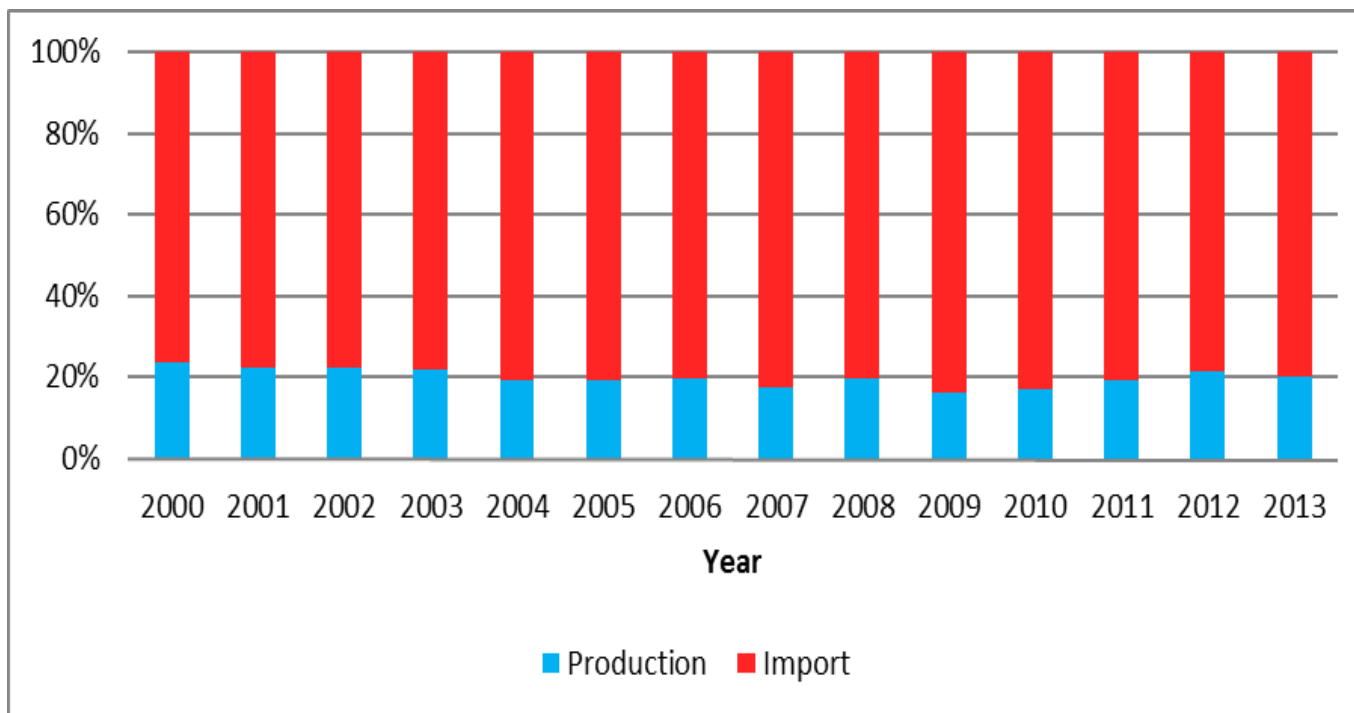
Ratio import vs. consumption remains almost the same (Fig. 10) although volumes varied.



**Fig. 10** Total consumption and imported volumes of crude oil 2000 to 2014

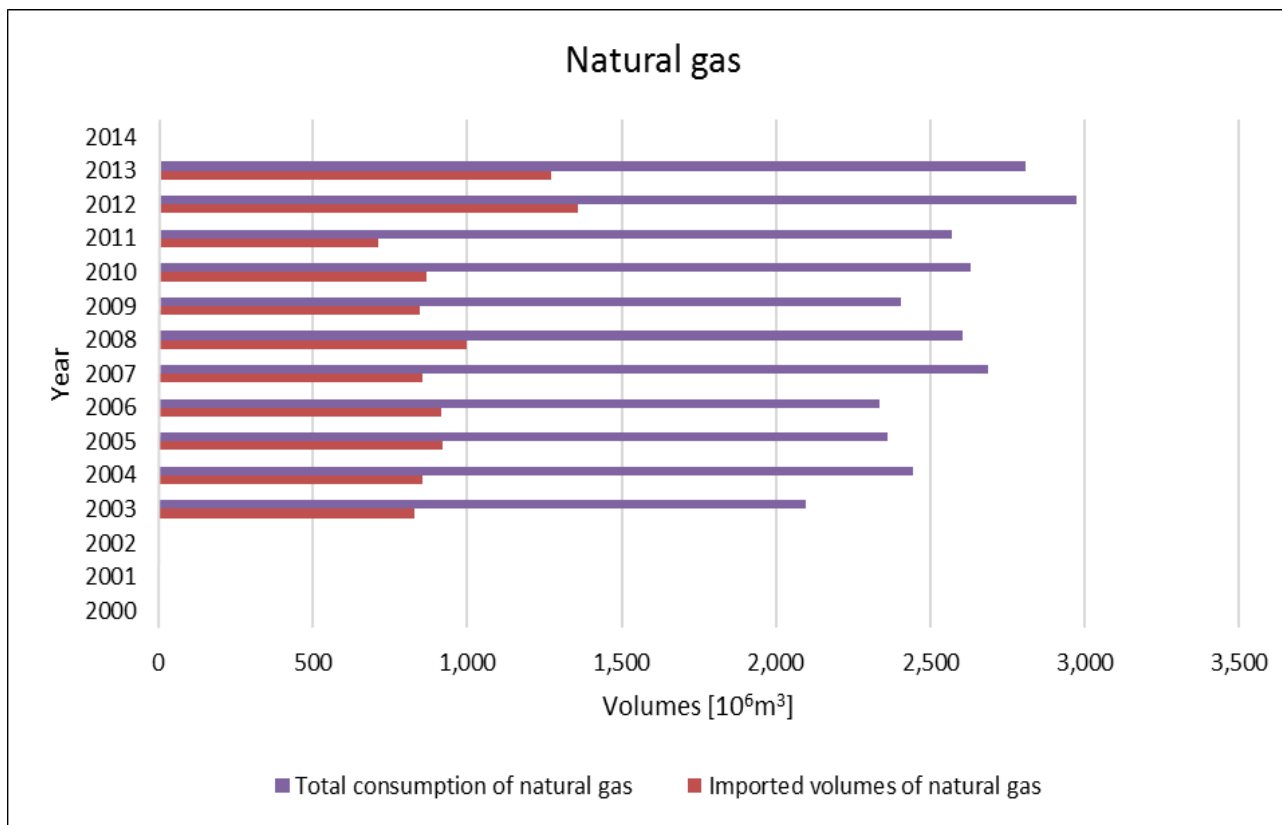


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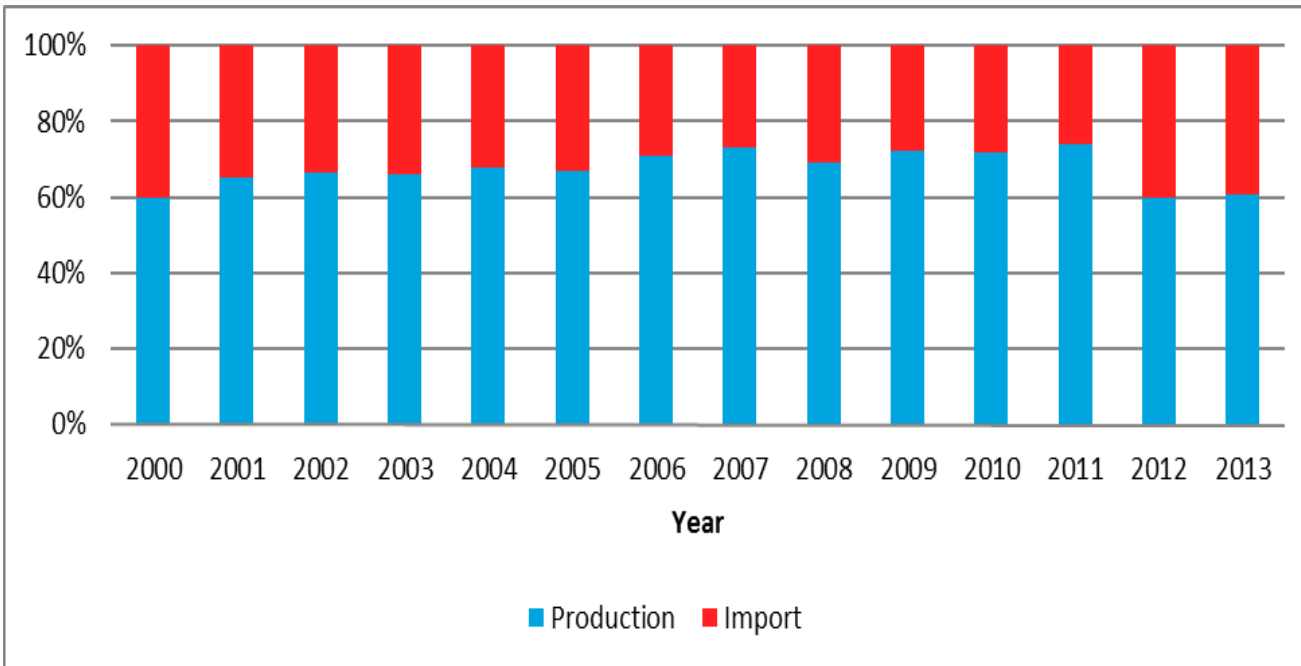
During 2000-2013 production fulfilled only about 20% of needs (**Fig. 11**)

**Fig. 11** Ratio of domestic production and imported volumes of oil in Croatia from 2000 to 2013 (Kišić, 2015)



Opposite to oil, for gas are imported volumes lesser than produced (**Fig. 12**)

**Fig. 12** Total consumption and imported volumes of natural gas 2000 to 2014



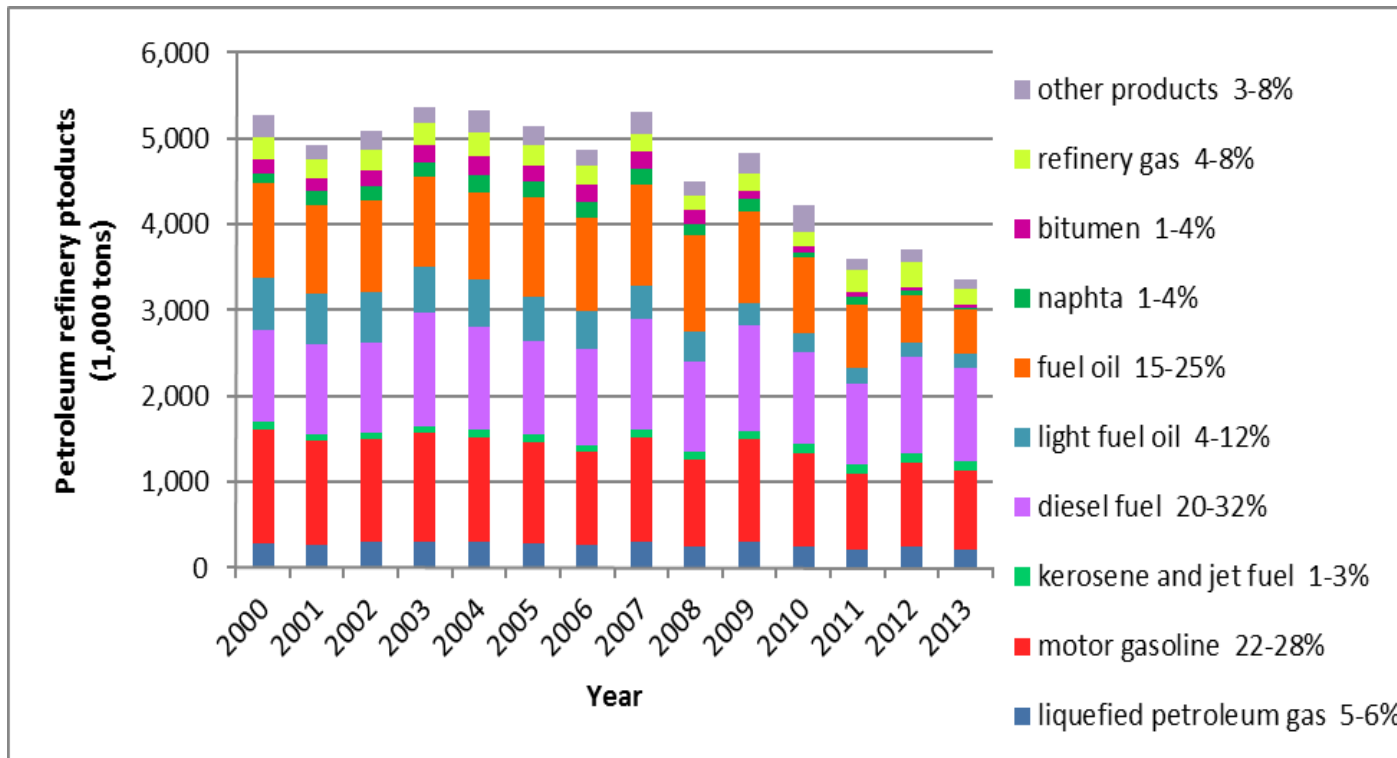
The same trend of domination of domestic gas vs. Imported is clearly seen at **Fig.** for entire period.

**Fig. 13** Ratio of domestic production and imported volumes of natural gas 2000 – 2013 (Kišić, 2015)

## . Processing (refinery) products in Croatia

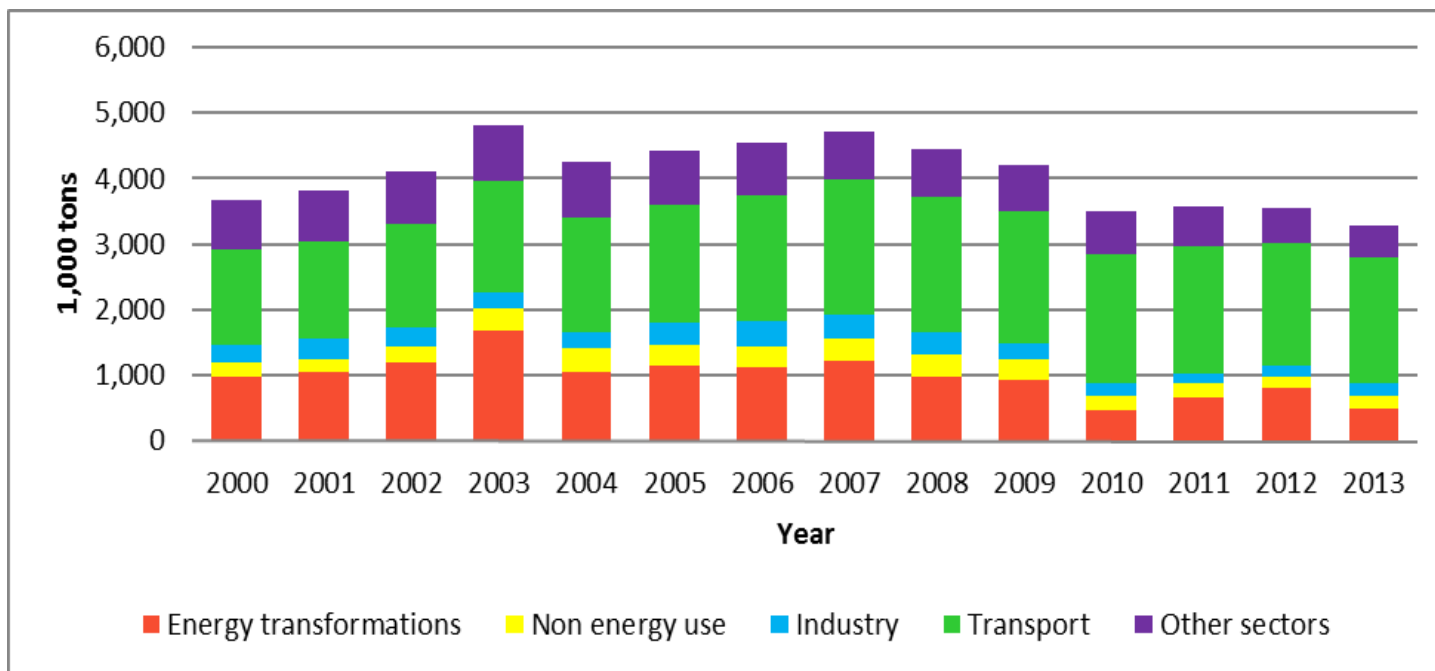


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Domination (about %)  
of gasoline,  
diesel and fuel oil  
**Fig. 14**

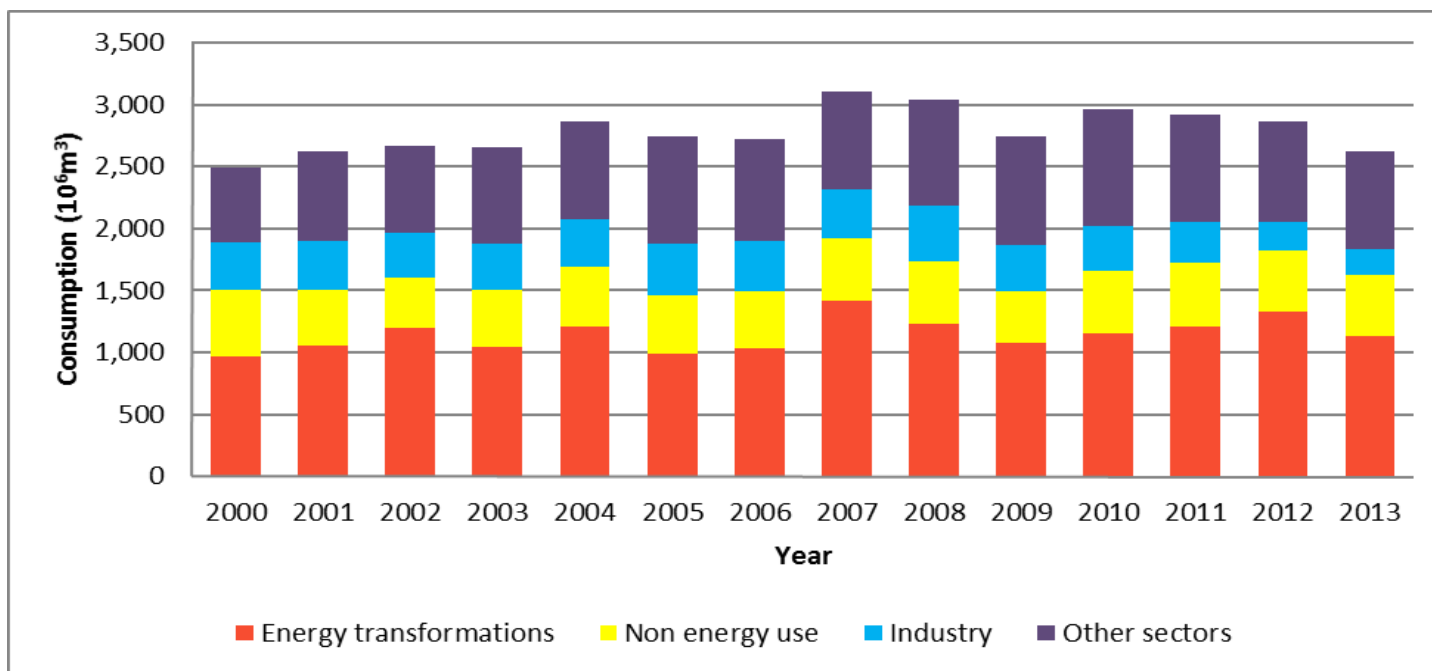
**Fig. 14** Petroleum refinery products in Croatia from 2000 to 2013 in % (Kišić, 2015)



The most petroleum products are used in transport  
**Fig. 15**

**Fig. 15** The consumption of oil products per sectors in Croatia from 2000 to 2013 (Kišić, 2015)





The most gas is consumed in energy transformation

Fig. 16

Fig. 16 The consumption of natural gas per sectors 2000–2013 (Kišić, 2015)

## . Conclusions

The Republic of Croatia has a **rich history in oil and natural gas exploration, recovering and processing.**

Currently around 60% of the needs for gas and 20% of the needs for oil are covered by local production.

Local production in Croatia is in decline, and in regards to expectations of increasing demand in the future, it will become **necessary to import larger quantities.**

In the **Croatian consumption** balance sheet of primary energy, oil and petroleum products make up the largest share. That should certainly **not change significantly in the following few decades.**

Only changes in the structure of petroleum products consumption are expected, with natural gas consumption shares on the rise.

In regards to this state of affairs, **Croatia should decrease its energy dependence on imported energy.** It is necessary to construct an efficient energy infrastructure, which would guarantee the safety of supply, for which surely there are numerous solutions.



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. Mention earlier, producing of hydrocarbons will continue to decline due to reservoirs depletion.

The Croatian segment of the **Pannonian Basin System** is a well-explored territory, however so-called residual hydrocarbons, by-passed oil and satellite reservoirs are supposed to exist, what is endorsed by numerous conducted researches.

In the **Northern Adriatic offshore** additional reserves of natural gas can also be expected, especially in parts that were not explored thoroughly.

In order for our refineries to operate successfully, they must meet the demands of a constantly changing market and asking for higher quality.

. They are in the process of technological restructuring, which should accomplish an increase in product quality and market price reflecting changes in the structure of petroleum product consumption.

Croatia can withstand the challenges of energy dependency by improving the **efficiency of energy use**, as well as using alternative forms of energy such as **renewable sources**, which should increase in importance in total consumption.

It is also important **to ensure diversity of import routes and storage** capabilities of oil and natural gas, to ensure safety of delivery in conditions of uncertainty.