

**The use of biofuels in transport in the Republic of Slovenia in  
2006**

**REPORT**

examination of data on the use of biofuels in transport in the Republic of Slovenia pursuant to Article 4(1) of Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport in 2006

Ministry for the Environment and Spatial Planning  
Ljubljana, June 2007

## CONTENTS

- 1. Introduction**
- 2. Legal framework**
- 3. Data on promoting the use of biofuels in transport**
- 4. Indicative target figure for the use of biofuels in phase 2**
- 5. Biomass for energy uses other than transport**
- 6. Total sales of transport fuel in 2006**
- 7. Sales of biofuels for transport in 2006**

Author:

Radovan Tavzes  
Ministry for the Environment and Spatial Planning  
Dunajska cesta 48, PO Box 653, Ljubljana 1000, Slovenia  
[radovan.tavzes@gov.si](mailto:radovan.tavzes@gov.si)

Dr Mirko Bizjak  
Slovenian Environment Agency  
Vojkova 1b, PO Box 2608, 1000 Ljubljana, Slovenia  
[mirko.bizjak@gov.si](mailto:mirko.bizjak@gov.si)

## **1. INTRODUCTION**

On 8 May 2003 the European Parliament and the Council adopted Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport (OJ L 123, 17.5.2003, p. 42) (hereinafter: Directive 2003/30/EC). Directive 2003/30/EC introduces measures to promote the use of biofuels and other renewable fuels to replace the use of diesel fuels and petrol in transport. This is a significant contribution to meeting objectives on improving the security of energy supply, reducing greenhouse gas emissions and creating new outlets for sustainable rural development.

Directive 2003/30/EC requires Member States of the European Union (hereinafter: EU) to ensure a minimum proportion of biofuels and other renewable fuels is used in transport and requires each country, to this end, to establish national objectives on the proportion of biofuels for transport placed on the market. Directive 2003/30/EC also establishes reference values for EU Member States for these national targets: 2% by the end of 2005 and 5.75% by the end of 2010. The percentage of biofuels is calculated on the basis of the energy values of those fuels with reference to the energy value of all petrol and diesel fuels used in transport.

In accordance with Article 4(1) of Directive 2003/30/EC, Member States must report to the Commission before 1 July each year on:

- the measures taken to promote the use of biofuels or other renewable fuels to replace diesel or petrol for transport purposes,
- the national resources allocated to the production of biomass for energy uses other than transport, and
- the total sales of transport fuel and the share of biofuels, pure or blended, and other renewable fuels placed on the market for the preceding year. Where appropriate, Member States shall report on any exceptional conditions in the supply of crude oil or oil products that have affected the marketing of biofuels and other renewable fuels.

## **2. LEGAL BASIS**

1. To implement the measures promoting the use of biofuels and other renewable fuels for transport to replace diesel and petrol of fossil origin, the Republic of Slovenia has adopted the following legislative acts:
  - a. An operational programme to reduce greenhouse gas emissions, a revised version of which was adopted by the Slovenian government in 2006, and an initial programming document in which the Republic of Slovenia introduced measures to promote the use of biofuels in transport. The operational programme states that the objective of introducing biofuels in transport in the first five-year Kyoto target period 2008–2012 is to reduce greenhouse gas emissions by 120 000 tonnes CO<sub>2</sub> equivalent a year, which will mean replacing 45 000 tonnes of diesel and petrol a year. Converting this Kyoto objective into

the percentage of the share of biofuels in transport, the average annual use of biofuels for the period 2008–2012 comes to around 3% of all road vehicle fuel.

- b. The Excise Duty Act (Slovenian Official Gazette No 84/98, last amended in No 122/06), which exempts biofuels used as motor fuels from the excise inspection and payment system when used in their pure form. When biofuels are blended with fossil fuels, a maximum 5% exemption from the payment of excise duty can be claimed, or more for standard fuels containing biofuels.
  - c. The Rules on the content of biofuels in motor vehicle fuels (Slovenian Official Gazette No 83/05, corrigendum No 108/05), which, in accordance with Directive 2003/30/EC, defines:
    - the types of biofuels used as transport biofuels and
    - the minimum level of biofuels in motor vehicle transport which fuel distributors must ensure for motor vehicles each calendar year up to 2010.
2. In Slovenian law the following concepts are used in connection with the use of biofuels for transport:
- biofuels are liquid or gaseous fuels for motor vehicle transport produced from biomass;
  - biomass is the organic biodegradable portion of agricultural production, waste and residues, which include matter of plant or animal origin, from forestry and associated production activities and organic biodegradable parts of industrial or municipal waste;
  - other renewable fuels are renewable fuels other than biofuels generated from renewable sources of energy in accordance with the rules governing approved electricity production, provided they are used for transport.
3. In accordance with the Slovenian legislation, the biofuels used as motor fuels in transport are as follows:
- ethanol, produced from biomass and/or the biodegradable fraction of waste, if used as biofuel (hereinafter: bioethanol);
  - fatty-acid methyl ester produced from plant or animal oil, provided that it has the properties of diesel and is used as a biofuel (hereinafter: biodiesel);
  - gas fuel produced from biomass and/or from organic biodegradable components of waste, provided it can be refined to the properties of natural gas and is used as a biofuel (hereinafter: biogas);
  - methanol produced from biomass, provided it is used as a biofuel (hereinafter: biomethanol);
  - dimethylether produced from biomass, provided it is used as a biofuel (hereinafter: biodimethylether);
  - ethyl tertiary butyl ether (hereinafter: ETBE), produced on the basis of bioethanol, if it contains at least 47% by volume ETBE and is considered a biofuel (hereinafter: bio ETBE);

- methyl tertiary butyl ether (hereinafter: MTBE), produced on the basis of biomethanol, if it contains at least 36% by volume MTBE and is considered a biofuel (hereinafter: bio MTBE);
- synthetic hydrocarbons or blended synthetic hydrocarbons produced from biomass (hereinafter: synthetic biofuel);
- hydrogen produced from biomass and/or from organic biodegradable components of waste, provided it is used as a biofuel (hereinafter: biohydrogen);
- oil produced from plants through pressing, extraction or comparable procedures, crude or refined but chemically unmodified, when compatible with the type of engines involved and the corresponding emission requirements (hereinafter: pure vegetable oil).

### **3. DATA ON PROMOTING THE USE OF BIOFUELS IN TRANSPORT**

#### **3.1 Financial incentives**

In accordance with the Excise Act, distributors of fuel for motor transport vehicles qualify for an exemption from excise duties, provided that the fuel is blended with the following biofuels:

- bio-ethanol,
- biodiesel,
- biogas,
- bio ETBE or
- biodimethyl ether.

The level of exemption from excise duties is proportional to the share of biofuel added.

#### **3.2 Obligations of fuel distributors**

In accordance with Articles 5 and 6 of the Rules on the content of biofuels in motor vehicle fuels (Slovenian Official Gazette No 83/05, corrigendum 108/05), distributors of fuel for transport vehicles must ensure that the annual average content of biofuels in all transport fuels placed on the Slovenian market in the particular calendar year is as follows:

- 2006 - equivalent of at least 1.2%,
- 2007 - equivalent of at least 2%,
- 2008 - equivalent of at least 3%,
- 2009 - equivalent of at least 4% and
- 2010 - equivalent of at least 5%.

The content of biofuels is expressed as a percentage of the energy value of all motor vehicle fuel placed on the market.

In accordance with the Rules on the content of biofuels in motor vehicle fuels, distributors may transfer obligations from one year to the next if the price of purchasing biofuels exceeds the total made up of the price of fossil fuels and the excise duties on them. On the basis of the provisions governing the transfer of distributors' obligations to place biofuels

on the market, the following are our estimates of the amount of biofuels to be placed on the market in the Republic of Slovenia in the following years:

- at least 0.7% in 2007,
- at least 1.2% in 2008,
- at least 2.3% in 2009,
- at least 3.4% in 2010,
- at least 4% in 2011,
- at least 4.5% in 2012 and, in the following years, at least 5% of the annual total quantity of motor vehicle fuel placed on the market.

### **3.3 Incentives to grow crops for biofuel production**

Upon accession to the EU, Slovenia adopted the market regulations and the system for direct payments for crops, introducing direct payments for the production of energy crops. In accordance with Articles 3 and 10 of the Decree for direct payments for producers of certain arable crops (Slovenian Official Gazette No 10/05, last amended by Nos 113/05 and 99/06), in addition to direct payments, producers of energy crops (rape seed oil) who received SIT 71 291/hectare in 2005 could also receive aid for energy crops in the amount of SIT 6 474/hectare.

### **3.4 Scope for own production of biofuels**

#### **3.4.1 Biodiesel**

In the Republic of Slovenia there is greatest scope for producing biodiesel or refined vegetable oil. The basic raw materials to produce both these types of biofuels is oil obtained from pressing the seeds of oil seed rape. Further processes are necessary for the esterification of the vegetable oil in order to produce the final extraction of biodiesel.

In 2005, approximately 2 500 hectares of land were sown with oil seed rape enabling, with an average yield of oil seed rape of 3 tonnes/hectare, production of 7 500 tonnes of oil seed equivalent to 2 500 tonnes of biodiesel a year. According to Ministry of Agriculture estimates, the Republic of Slovenia has available between 6 000 and 7 000 hectares of land suitable for the production of oil seed rape.

In 2005 in Slovenia biodiesel was being produced by three major biodiesel producers. In two locations, biodiesel was produced in decentralised production plants, whose capacity does not exceed 2 000 tonnes of biodiesel a year, while in the third, production was carried out, for the most part, on an industrial basis. The biodiesel was produced using rapeseed produced on Slovenian farms and imported raw materials.

According to producer figures, a total of approximately 6 000 tonnes of biodiesel was produced in 2005, more than half of which was grown abroad, in Austria and Germany.

There are plans for more biodiesel production units to start operating over the next two years. In these, biodiesel production will be based predominantly on imported oil, waste cooking oil and animal fats and only to a lesser extent on domestically grown oil.

### **3.4.2 Bioethanol**

Slovenia does not have any plants that produce bio-ethanol or other types of biofuels suitable for blending with petrol nor does it have any refineries or plants that blend imported biofuels with petrol.

### **3.5 Incentives for local communities for sustainable development of transport**

On the initiative of Ljubljana city council, the Ljubljana Public Passenger Transport Office (LPP) joined the European Commission's CIVITAS II - MOBILIS programme, which is designed to encourage local authorities to develop sustainable transport and to introduce transport solutions that are human- and environmentally-friendly and as efficient as possible. The objectives of the project are to test the use of biodiesel to power urban bus vehicles, to reduce the quantity of environmentally harmful exhaust gases and to lower fuel costs. In July 2005 a blend of fossil diesel (80%) and biodiesel (20%) was tested in two LPP urban buses but, due to the difficulties of storing the fuel, there will be a switch in 2006 to 100% biodiesel.

## **4. INDICATIVE TARGET FIGURE FOR THE USE OF BIOFUELS IN PHASE 2**

The Republic of Slovenia's indicative target figure for phase 2 pursuant to Directive 2003/30/EC is for biofuel to account for 5% share of all transport fuels in 2012, entailing an increase from an average annual share of around 0.7% in 2007 of at least 3% averaged over the period 2008-2012, as follows:

- at least 2% by 2008,
- at least 3% by 2009,
- at least 3.5% by 2010,
- at least 4% by 2011 and, for the following years, at least 5% of the total annual quantity of motor vehicle fuel placed on the market.

## **5. BIOMASS FOR ENERGY USES OTHER THAN TRANSPORT**

Through its energy programme for the use of different sources of biomass, primarily aimed at generating electricity and heat, the Republic of Slovenia contributes to achieving EU objectives on improving security of energy supply, reducing greenhouse gas emissions and creating new outlets for sustainable rural development. According to data from the Slovenian Statistics Office, Slovenia's consumption of wood and other solid biomass as fuel to produce electricity and heat produces at least 18.7 PJ a year, or approximately 6% of total primary energy consumption (320 PJ) per year.

## 6. TOTAL SALES OF TRANSPORT FUEL IN 2006

Table 1 shows the total consumption of motor vehicle fuel placed on the market in Slovenia in 2006:

Table 1:

| <i>Fuel</i>                           | <i>Sales in 2006(kg)</i> |
|---------------------------------------|--------------------------|
| <i>Diesel</i>                         | <i>901 607 101</i>       |
| <i>Unleaded petrol (95≤RON&lt;98)</i> | <i>546 339 946</i>       |
| <i>Unleaded petrol (RON≥98)</i>       | <i>52 636 839</i>        |
| <i>TOTAL</i>                          | <i>1 500 583 886</i>     |

## 7. SALES OF BIOFUELS FOR TRANSPORT IN 2006

In 2006 in the Republic of Slovenia, transport fuel of mineral origin was replaced mainly by biodiesel and to a much lesser extent by other biofuels such as bioethanol and ETBE (ethyl tertiary butyl ether). Biodiesel as a transport fuel is used in pure form, i.e. 100% biodiesel, and in blends with traditional fossil diesel. Most biofuels are sold as blends of biofuels and diesel, where the content of biofuel does not exceed 5%.

In Slovenia biodiesel was used in trial blends with diesel for road transport vehicles in 2004. In 2005 and 2006 its share in fossil diesel and the share of other biofuels (such as bioethanol and ETBE) gradually increased, and we expect this trend to continue in the years to come. Biodiesel/diesel blends were partly imported from third countries or other EU Member States and partly produced in Slovenian vegetable oil production plants. Due to difficulties with the quality of the fuel/biofuel during the second half of 2005, the biofuel/fossil fuel blend was temporarily suspended. Over the year the share of biodiesel increased substantially, but the Republic of Slovenia did not reach the target quota. Data on exemptions from excise duties and data from distributors show that the amount of biodiesel blended with diesel reached 4 642 422 kg in 2006 (Table 2).

On the basis of data on monitoring the biofuels sold for transport, seven transport fuel distributors placed a total 4 914 587 kg of biofuels on the market in the Republic of Slovenia in 2006, as Table 2 shows in more detail.

Table 2:

| Carried out in 2006:   | distributor 1        | distributor 2         | distributor 3         | distributor 4      | distributor 5      | distributor 6        | distributor 7      | All distributors together |
|--|----------------------|-----------------------|-----------------------|--------------------|--------------------|----------------------|--------------------|---------------------------|
| <b>NMB98 (kg)</b>  | 1 027 623            | 30 340 802            | 21 263 636            | 0                  | 4 778              | 0                    | 0                  | 52 636 839                |
| <b>NMB95 (kg)</b>  | 15 329 433           | 122 909 807           | 397 476 230           | 0                  | 0                  | 9 240 430            | 1 384 046          | 546 339 946               |
| Diesel (kg)  | 44 684 364           | 243 150 807           | 553 484 391           | 3 865 460          | 19 628 730         | 34 176 940           | 2 616 557          | 901 607 101               |
| <b>Total fuel excluding biofuels (kg)</b>                                | <b>61 041 420</b>    | <b>396 401 268</b>    | <b>972 224 257</b>    | <b>3 865 460</b>   | <b>19 633 508</b>  | <b>43 417 370</b>    | <b>4 000 603</b>   | <b>1 500 583 886</b>      |
| <b>NMB98 without bioethanol (MJ)</b>                                     | 45 061 287           | 1 330 444 177         | 932 410 431           | 0                  | 209 515            | 0                    | 0                  | 2 308 125 410             |
| <b>NMB95 without bioethanol (MJ)</b>                                     | 672 195 621          | 5 389 595 025         | 17 429 332 642        | 0                  | 0                  | 405 192 856          | 60 690 417         | 23 957 006 561            |
| Diesels excluding biodiesel (MJ)   | 1 903 553 896        | 10 358 218 064        | 23 578 435 046        | 164 668 596        | 836 075 677        | 1 455 937 772        | 111 465 328        | 38 408 354 379            |
| <b>Total fuel excluding biofuels (MJ)</b>                                | <b>2 620 810 804</b> | <b>17 078 257 266</b> | <b>41 940 178 119</b> | <b>164 668 596</b> | <b>836 285 192</b> | <b>1 861 130 628</b> | <b>172 155 745</b> | <b>64 673 486 350</b>     |
| Bioethanol in NMB98 (kg)   | 4 867                | 0                     | 0                     | 0                  | 0                  | 0                    | 0                  | 4 867                     |
| Bioethanol in NMB95 (kg)   | 267 398              | 0                     | 0                     | 0                  | 0                  | 0                    | 0                  | 267 398                   |
| Biodiesel (kg)   | 694 996              | 998 488               | 2 347 798             | 0                  | 2 540              | 598 600              | 0                  | 4 642 422                 |
| <b>Total biofuels (kg)</b>   | <b>967 261</b>       | <b>998 488</b>        | <b>2 347 798</b>      | <b>0</b>           | <b>2 540</b>       | <b>598 600</b>       | <b>0</b>           | <b>4 914 687</b>          |
| Bioethanol in NMB98 (MJ)   | 129 792              | 0                     | 0                     | 0                  | 0                  | 0                    | 0                  | 129 792                   |
| Bioethanol in NMB95 (MJ)   | 7 131 514            | 0                     | 0                     | 0                  | 0                  | 0                    | 0                  | 7 131 514                 |
| Biodiesel (MJ)   | 25 645 361           | 36 844 191            | 86 633 746            | 0                  | 93 741             | 22 088 340           | 0                  | 171 305 379               |
| <b>Total biofuels (MJ)</b>   | <b>32 906 667</b>    | <b>36 844 191</b>     | <b>86 633 746</b>     | <b>0</b>           | <b>93 741</b>      | <b>22 088 340</b>    | <b>0</b>           | <b>178 566 685</b>        |
| m/m % biofuels in NMB98  | 0.47                 | 0.00                  | 0.00                  | 0.00               | 0.00               | 0.00                 | 0.00               | 0.009                     |
| m/m % biofuels in NMB95  | 1.74                 | 0.00                  | 0.00                  | 0.00               | 0.00               | 0.00                 | 0.00               | 0.049                     |
| m/m % biofuels in diesel   | 1.56                 | 0.41                  | 0.42                  | 0.00               | 0.01               | 1.75                 | 0.00               | 0.515                     |
| <b>Share of biofuels in all fuels including biofuels (m/m %)</b>         | <b>1.58</b>          | <b>0.25</b>           | <b>0.24</b>           | <b>0.00</b>        | <b>0.01</b>        | <b>1.38</b>          | <b>0.00</b>        | <b>0.328</b>              |
| Energy share of biofuels in NMB98 (E/E %)                                | 0.29                 | 0.00                  | 0.00                  | 0.00               | 0.00               | 0.00                 | 0.00               | 0.01                      |
| Energy share of biofuels in NMB95 (E/E %)                                | 1.05                 | 0.00                  | 0.00                  | 0.00               | 0.00               | 0.00                 | 0.00               | 0.03                      |
| Energy share of biofuels in diesel (E/E %)                               | 1.33                 | 0.35                  | 0.37                  | 0.00               | 0.01               | 1.49                 | 0.00               | 0.44                      |
| <b>Energy share of biofuels in all fuels, including biofuels (E/E %)</b> | <b>1.24</b>          | <b>0.22</b>           | <b>0.21</b>           | <b>0.00</b>        | <b>0.01</b>        | <b>1.17</b>          | <b>0.00</b>        | <b>0.275</b>              |

The average share of biofuels placed on the market in the Republic of Slovenia in 2006 is shown in Table 3.

Table 3:

| <i>Fuel</i>  | <i>Share of biofuels (%)</i> |
|--|------------------------------|
| <i>Biofuels: average share in transport fuel in 2006 - by mass</i>   | <i>0.328 %</i>               |
| <i>Biofuels: average share in transport fuel in 2006 - by energy</i> | <i>0.275 %</i>               |