



COMPARATIVE STUDY OF THE CURRENT RATE OF BIODIESEL USE



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Project **PROBIO**

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1. INTRODUCTION

The presented Comparative report is one of the groundwork activities for implementation of the PROBIO project. In the report, European agencies, involved in the project, have developed in-depth analysis of the current rate of integration in the biodiesel supply chain and its potential in their respective regions:

- Burgos (Spain),
- Avila (Spain)
- Huelva (Spain)
- Pomurje (Slovenia)
- Abruzzo (Italy)

The Comparative report is the very first report which was implemented under Work Package 2, the the key technical WP to face the work.

On the one hand, the report encompasses the current situation on biodiesel production with supply of raw inputs to the biodiesel plant, and, on the other hand, presents final consumption of biodiesel in the respective regions.

European agencies, involved in the development of the report are the following:

- Agencia Provincial de la Energia de Burgos (Spain)
- Agencia Provincial de la Energia de Avila (Spain)
- Exma. Diputacion Provincial de Huelva (Spain)
- Razvojna agencija Sinergija (Slovenia)
- Regione Abruzzo (ARAEN)

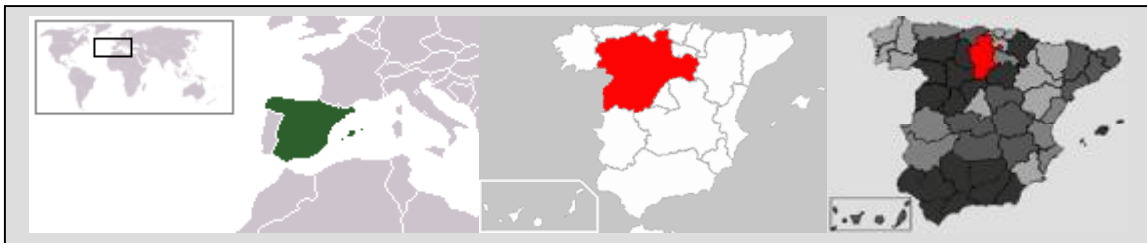
Taking into account the Comparative report and the Report on analysis of barriers (which is yet to be developed), the project partners will have sufficient background for elaboration of the conceptual strategy with an objective to bridge/overcome barriers standing in the way of smooth biodiesel supply chain.

2. STATISTICAL DATA OF THE ANALYZED REGIONS

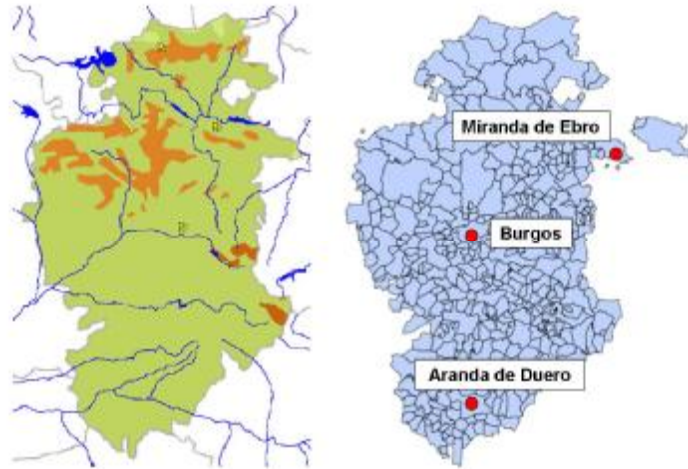
2.1 Geographical Characteristics

BURGOS(SPAIN)

Burgos is a province of northern Spain, located in the Autonomous Community of Castilla y León. Its capital is the city of Burgos. The province lies in the northern of the plateau of Castile and its waters are carried into the Atlantic and the Mediterranean Sea. The main rivers in the province are Ebro River (on the north of the province) and Duero River (on the south of the province), which waters the most important wine-producing area of the region: Ribera del Duero. Its scenery is a mixture of barren land, moors, mountains, valleys and narrow passes, a representative combination of inland Spain with an altitude of 700 m on average. The highest mountain (Pico San Millán, 2134 m) is located in the south-east of the province (Sierra de la Demanda), which is the main mountainous area.



The province has an area of 14,300 km² and a population of 363.874 of whom nearly half live in the capital, Burgos (173.676 inhabitants). The only large towns apart from the capital are Miranda de Ebro (38.276 inh) and Aranda de Duero (31.545 inh).



AVILA (SPAIN)

Avila province is one of the nine forming Castilla y Leon, situated in the northern half of the Great Central Plateau of the Iberian Peninsula. Province is between the geographical coordinates (Madrid Meridian) North latitude $40^{\circ} 7' 3''$ and $41^{\circ} 13' 0''$, West Length $0^{\circ} 28' 3''$ and $2^{\circ} 2' 20''$.

Avila Province is delimited by Valladolid in the North, by Segovia and Madrid in the East; by Toledo and Caceres in the South and by Salamanca in the West. Avila Province has a lightly equilateral triangle shape.

The Province is divided in two perfectly differentiated parts, the flat part placed to the north with a surface of 2.000 square kilometres approximately and the mountainous clumps with their beautiful valleys occupy 6.000 square kilometres of the rest of the provincial territory.

The mountainous zone crosses the province of Avila from East to West with three principal mountains and a secondary one: The Mountains of Avila (1.517 m), the Central Mountain Chain (2.294 m), Gredos's Mountain (2.592 m) and the mountain of Ojos Albos (1.700 m).

Rivers that flow in the province of Avila belong to the fluvial basins of the Duero and Tajo, which mains rivers are:

- Duero Basin: Tormes, Aravalle, Corneja, Adaja, Arevalillo, Voltoya, Zapardiel and Trabancos
- Tajo Basin: Alberche, Cofio and Tiétar

The province is divided in six regions, in accordance with the regions divisions on Farms in Spain, realized and published by the General Technic Secretariat of the Department of Agriculture, these regions are:

Arevalo-Madrigal: placed in the North of the province with predominance of flat lands, it is called Moraña

Avila: placed between the Moraña and the Paramera mountain

Barco de Avila - Piedrahita: placed between the mountain of Avila and the province of Salamanca

Gredos: In the South of Avila and Piedrahita and in the East of Barco de Avila

Low Valley Alberche: it takes the name of the Alberche river that crosses it

Tietar Valley: It is the region more southern, spreads in the south of Gredos and along the Tietar river

The mains localities are:

Avila, 60.853 inhabitants: the county town, former city founded by Celtiberian tribes. Singular Romanesque wall constructed at the end of the XIth century, with perimeter of

2.526 meters of length, 88 large fortified towers and 9 gates. Monumental city with abundance of Romanesque and Gothic buildings, cradle of Saint Teresa de Jesus. Declared city Patrimony of the Humanity by the UNESCO, in 1985.

Others important localities are: Arevalo (7.835 inhabitants), Las Navas del Marques (5.098 inhabitants), Arenas de San Pedro (6.682 inhabitants), Candelada (5.137 inhabitants), El Tiemblo (4.071 inhabitants), El Barco de Avila (2.673 inhabitants).

The past important on the agriculture in the economy has taken step forward the sector services, which at the moment represents more than 60 % of the total production





HUELVA (SPAIN)

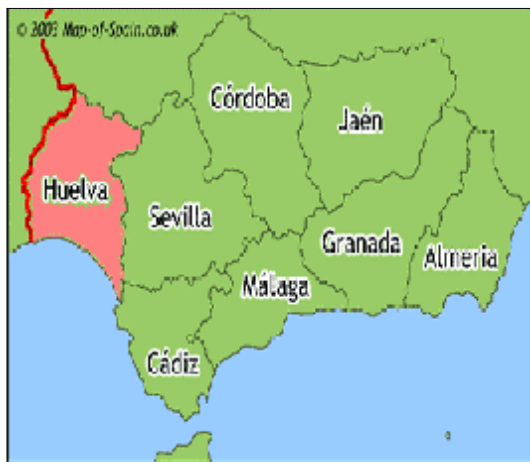
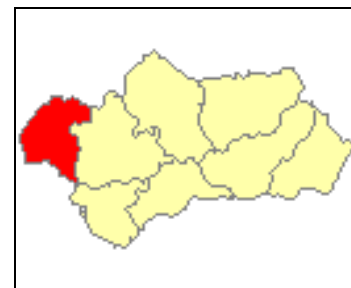
Huelva is a province of southern Spain, in the western part of the autonomous community of Andalusia. It is bordered by Portugal, the provinces of Bajadoz, Seville, Cádiz and the Atlantic Ocean.

Huelva is located along the Gulf of Cadiz coast, at the confluence of the Odiel and Tinto rivers. The rivers Piedra, Tinto and Odiel rise in the mountain and they descend from the mountain to the Atlantic Ocean.

The river Guadiana is bordering the province of Huelva and Portugal. Its capital is Huelva. The Huelva region includes 79 municipalities, the more important towns are: Ayamonte, Valverde del Camino, Lepe, Aracena, Almonte, Aljaraque, Gibraleón, Moguer.

Its area is 10,028 Km². Its population is 483,792 (2005), of whom about 30% live in the capital, and its population density is 47.67/km².

The economy is based on agriculture and mining. The province contains Palos de la Frontera, and Moguer, where Christopher Columbus sailed out of on his first voyage in 1492, and shares the National park of Doñana with Seville province.





POMURJE (SLOVENIA)

Pomurje is a region located in the North-East of Slovenia by the central stream of the river Mura. The region borders to Austria, Hungary and Croatia. Its relatively restrictive area of 1.337 km² (6,6% of total Slovenia area) has about 123.280 inhabitants, which represents cca. 6,3% of the total inhabitants of Slovenia.

The region is one of 12 statistical regions in Slovenia. The Pomurje region includes 27 municipalities and has no official government, but the Regional Council for Regional Development, which consists of municipality mayors and takes decisions about regional priorities, programmes, measures, projects, etc. Regional actors work together to reach consensus in harmonizing development anticipations and tasks of the country, the regions and the municipalities in the field of economic, social, spatial, environmental and cultural development.

Murska Sobota (20.080 inhabitants) is the regional city centre and is about 60 km far away from Maribor, 190 km from the capital city Ljubljana and 90 km from Graz (Austria).

Thanks to its strategic location, the Pomurje region is a cross-border region of four countries (Slovenia, Austria, Hungary and Croatia), Pomurje becomes every day more and more important in economic and cultural development of the cross-border region. One of the most valuable resources of the region is its unspoiled natural environment, which is a good basis for sustainable development.

Important economic activities in the region are connected to industry, agriculture and forestry, construction, trade activities, production, service craft trade, and many others. The region is striving for enlivenment of economic development. One of the key priorities of long-term development direction of Pomurje is by all means energy policy and energy planning. Both lead to important energy and environmental aims, such as air quality improvement, sustainable regional development and nonetheless the global responsibility for protecting the climate.

Photo: Pomurje region, located in Europe and Slovenia



ABRUZZO (ITALY)

Abruzzo is a central Region of Italy located on the Adriatic sea.



Regione Abruzzo is divided into four provinces, Chieti, L'Aquila, Pescara and Teramo with 305 Municipalities. The territory of the Region is, roughly, the shape of a semicircle with a diameter of about 150 kilometres. The coastline, 129 kilometres long, stretches from the river Tronto to the Trigno and constitutes the eastern boundary of the region, while the North borders with Marche, the South with Molise and the West with Lazio. The land boundaries of the region are 467 kilometres long altogether.



The regional territory covers 10,794 square kilometres, the majority of which (65.1%, 7,027 square kilometres) is mountainous. 34.9% is constituted by hills. The statistics do not mention the plains. Near the coast, in fact, there are no plains, whereas in the inland there are a few, in the river's valley bottoms and also at high altitudes. The largest plain, the Piana del Fucino, can be considered "artificial" because it was the result of the drying up of the lake Fucino in the last century. The territory of the four provinces of Abruzzo is divided in very different altimetric areas. The province of L'Aquila is totally characterized by mountains; in the Chieti area hills prevail, while in Pescara and Teramo the areas covered by mountains are more or less the same as those covered by hills.



Gran Sasso Mountain



Regione Abruzzo Seaside

2.2 Population and climatic conditions

BURGOS (SPAIN)

Population

The main population data of the province of Burgos (2006) are showed in the following table:

Population (inhabitants)	363.874	
Surface (km ²)	14.292	
Inhabitant density (occupants/km ²)	25,5	
% Male population	50,4%	
% Female population	49,6%	
Number of municipalities	> 100.001 inh.	1
	20.001 – 100.000	2
	1.001 – 20.000 inh.	23
	101 – 1.000 inh.	214
	< 100 inh.	131
	Total	371

Although there are a large number of municipalities, most of them have fewer than 100 inhabitants. The depopulation in rural areas is evident.

Climatic conditions

The climatic conditions of the province of Burgos are determined by the altitude and the presence of the Cantabric Mountains in the north of the province. In general, the temperatures are low, mainly in winter (with several frost days), and the rainfall doesn't exceed 600 mm/year, except in the north-east area.

Average temperature (°C):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
2,3	3,8	6,3	8,6	11,8	15,6	18,5	18,7	15,7	10,9	6,0	2,9	10,1

Average rainfall (mm):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
46,9	45,0	54,9	57,3	64,5	49,1	25,1	23,3	45,3	51,7	59,4	48,1	570,2

AVILA (SPAIN)

Population

The province relies on a whole of 248 municipalities and 167.818 inhabitants, of that only 20 people exceed the 1.000 inhabitants, and only 4 overcome the 5.000, centering the population in the County Town, Tietar Valley and Alberche Valley, the rest they are municipalities with scanty population what characterizes to the province for its lack of intermediate centres of population and therefore an important dispersion of its inhabitants with a population density which places in 21,04 habitantes/km², very far from the national average, besides for some years a gradual and continued decrease is accused by a very aged population. It is necessary to emphasize the inhabitants's increase in the vacation periods and weekends since many people have the second residence concentrated on our province.

Population according to economic activity: (year 2005)

	ACTIVIES	OCCUPIED					UNEMPLOYED
		Agriculture	Industry	Building	Services	Total	
Total	70,1	7,2	10,7	10,8	35,3	63,9	6,2
Men	43,9					41,7	2,3
Women	26,1					22,2	3,9

8.050,15 square kilometres of the province represent 1,6 % of the national surface, occupying the place 30 in the extension order of the Spanish provinces.

Climatic Conditions

The climate of the province of Avila, due to its height, is Alpine; very cold in the mountains, with some temperance in its valleys; extreme climate in the flat land in the north with coolly winter and heat summer, and moderated in the south in the Gredos Mountain and low Alberche. The high summits of the mountains remain snowed for seven months a year and in some Gredos's peaks perpetual ice sellers exist.

Except in the Tietar zone, the frosts are habitual and in the mountainous zones minimal temperatures are registered under zero for five months a year, nevertheless the lack of

dampness, lower than 50 % when it does not rain or snows, does that it is a question of a "dry cold".

Average temperature °C: (year 2005)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
2,7	0,6	7,0	10,0	15,0	21,3	22,0	21,6	16,7	12,5	5,5	3,7	11,6

Absolute Minimum temperature °C: (year 2005)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
-10,0	-12,0	-13,2	-4,0	2,0	10,2	9,6	6,4	2,4	1,8	-3,8	-6,2	-13,2

Absolute Maximum temperature °C: (year 2005)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
14,0	15,2	20,8	25,4	29,6	34,2	35,2	37,4	32,2	24,6	16,6	11,8	37,4

Average rainfall (mm): (year 2005)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
0,3	49,7	10,0	27,3	34,1	23,2	0,0	13,1	23,2	112,9	55,6	22,2	371,6

Sunny Hours: (year 2005)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
162,3	164,5	225,7	236,5	259,8	328,0	363,5	330,2	269,9	176,0	126,3	133,1	2775,8

HUELVA (SPAIN)

Population: 483,792 (2005),

Surface: 10.028 Km²

Average temperature °C:

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2005	9,3	9,4	14,2	16,9	20,8	24,6	26,0	25,9	23,0	19,4	13,8	11,9	17,9
2004	12,3	12,7	14,0	15,5	18,0	25,3	27,1	26,5	23,4	19,7	14,5	11,4	18,4
2003	11,2	11,7	15,0	15,9	21,1	24,5	26,0	27,4	24,0	19,4	15,2	12,0	18,6
2002	12,3	13,2	15,0	16,2	18,7	22,3	25,1	23,9	21,9	19,7	15,3	13,6	18,1
2001	12,3	13,0	15,4	17,2	18,8	24,4	24,7	25,3	22,4	20,3	13,6	11,4	18,2
2000	9,9	14,2	15,2	14,4	19,4	23,4	25,0	25,7	23,1	18,8	14,0	12,8	18,0

Average rainfall (mm):

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2005	0,1	39,2	17,0	15,0	32,1	0,0	0,0	0,0	0,8	119,6	46,2	22,3	292,3
2004	13,2	188,1	42,0	29,2	29,6	0,0	0,0	8,3	0,1	91,6	30,0	5,3	437,4
2003	52,5	49,2	54,9	98,1	8,8	1,7	0,0	0,2	15,4	179,6	74,0	110,2	644,6
2002	34,0	5,9	67,1	66,6	24,7	1,2	0,0	0,0	59,4	49,2	115,4	137,7	561,2
2001	114,8	28,3	97,8	7,3	5,1	0,4	0,0	2,2	81,3	92,3	188,9	60,8	679,2
2000	29,1	0,1	32,8	110,1	74,3	0,0	0,0	0,0	5,1	33,3	61,7	234,9	581,4

POMURJE (SLOVENIA)

Population: **123.280** inhabitants (Slovenia = 2.001.114)

Surface: **1.337 km²** (Slovenia = 20.273 km²)

Average temperature °C:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
-0.6	1.4	5.9	10.4	15.8	19.2	20.7	20.6	15.0	10.3	5.0	-0.4	10.3

Average rainfall (mm):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
24.0	25.5	42.5	55.6	69.1	96.5	81.0	78.1	90.9	80.8	69.9	50.0	770.1

ABRUZZO (ITALY)

Below the main data to characterize the regional territory:

Demographic indicator

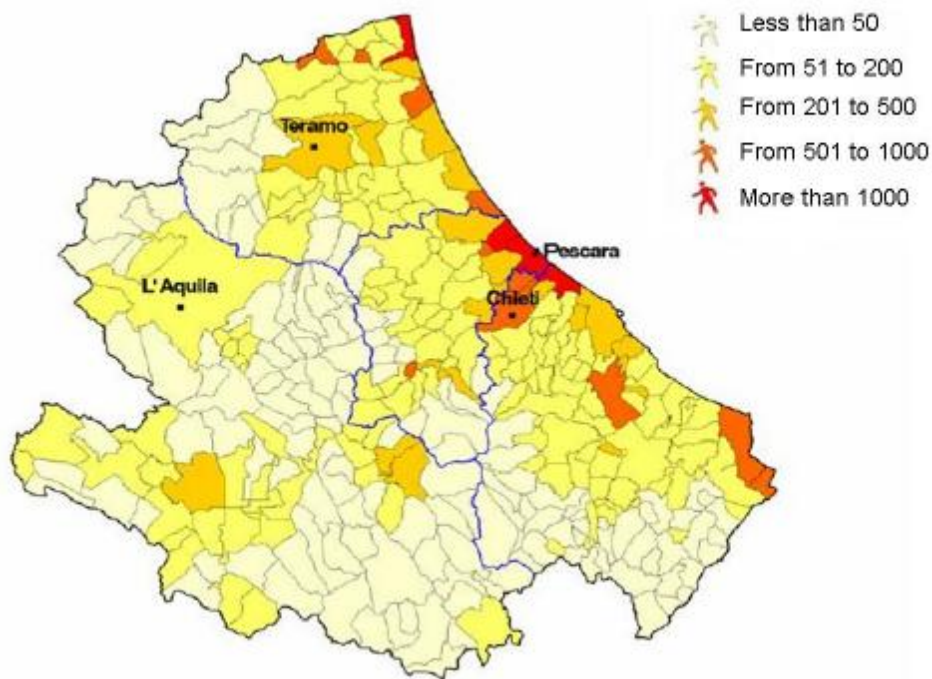
Population / 31.12.2005 1.305.307

Families / 21.10.2001 462.066

People for family (2002-2003) 2,7

Foreigners / 31.12.2004 38.582

Population density (people/kmq) – 2005 121



Municipality Population Density

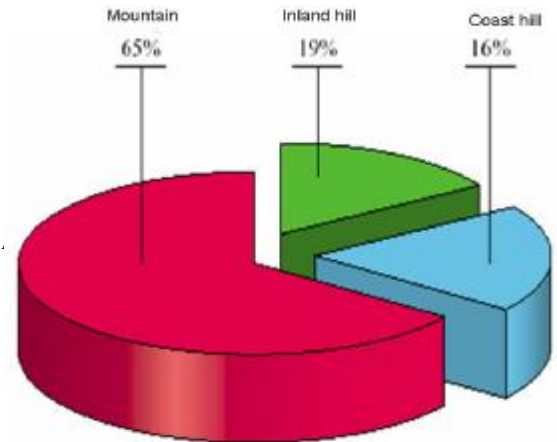
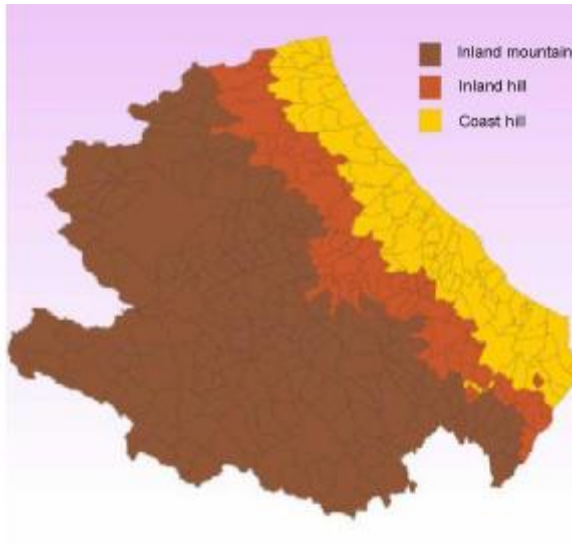
Territorial Information

AREA square km	10.795,12
MOUNTAIN COMMUNITIES	19
PROTECTED AREAS square Km	2.970,31
PROVINCES	4
MUNICIPALITIES	305

The Provinces

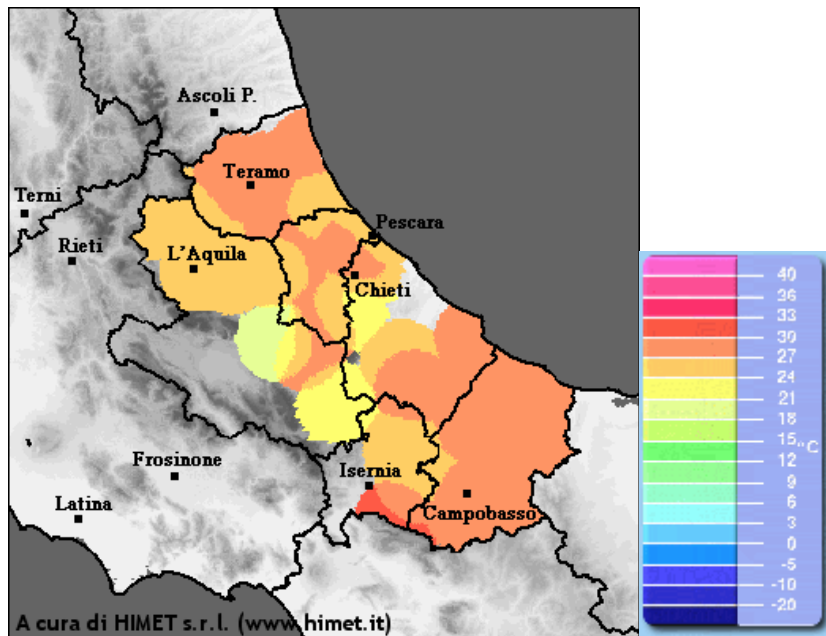


	L'Aquila	Teramo	Pescara	Chieti
<u>Municipalities</u>	108	47	46	104
<u>Maximum Altitude</u>	2.793	2.912	2.793	2.793
<u>Minimum Altitude</u>	250	0	0	0
<u>Medium Altitude</u>	1.146	598	510	500
<u>Area (kmq)</u>	5.0364	1.948	1.225	2.587
<u>Coast hill area (kmq)</u>	0	594	305	1.119
<u>Hill area (kmq)</u>	0	574	476	627
<u>Mountain Area (kmq)</u>	5.034	780	444	769
<u>Areas to 600 m.</u>	394	1.911	921	1.311
<u>Areas from 600 to 1.400 m.</u>	3.384	540	245	495
<u>Areas over 1400 m.</u>	1.253	115	62	151



egione Abruzzo territory divided into
Altimetric Areas

Average temperature °C:



Temperatures in Regione Abruzzo (Source: Cetemps)

In the picture above you can see minimum and maximum average monthly temperatures in the three stations in Abruzzo: Avezzano (700m high), Campo Imperatore (2138 m high) and Pescara (11 m on the sea level).

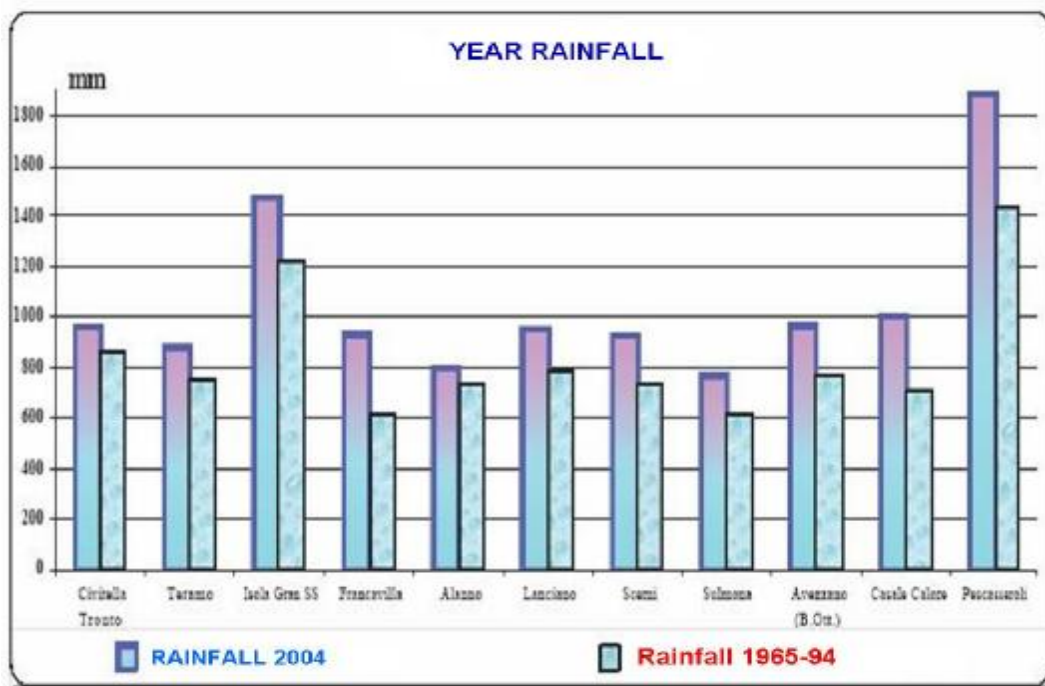
In Avezzano the average year temperature is 11°C. The minimum temperatures go from – 2°C in January to 14° in August: the maximum average monthly temperatures

vary from 6°C in January and 27°C in August. The average thermal excursion varies between 7°C in January and 13°C in July.

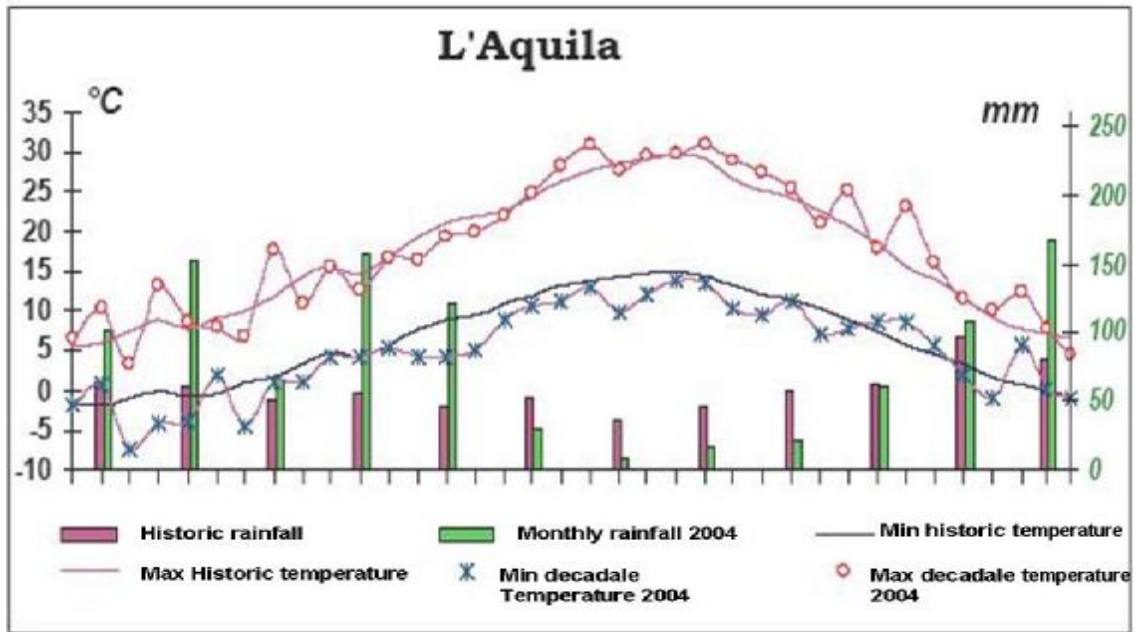
As to Campo Imperatore station (2138 m) the average year temperature is 8°C. The minimum temperatures go from – 6°C in January to 9° in August: the maximum average monthly temperatures vary from 8°C in January and 18°C in August. The average thermal excursion varies between 6°C in January and 9°C in July.

The station in Pescara (11 m on the sea level) has an annual average temperature of 14°C. The minimum temperatures go from 2°C in January to 17° in August: the maximum average monthly temperatures vary from 10°C in January and 28°C in August. The average thermal excursion varies between 8°C in January and 12°C in July.

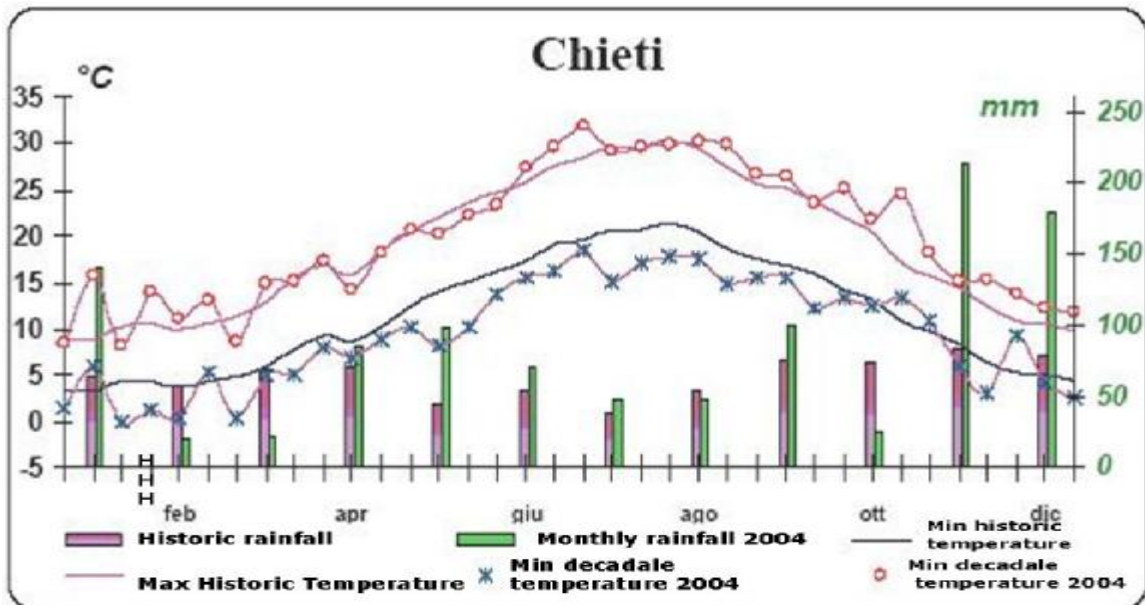
A.R.T.A. - Agenzia Regionale per la Tutela dell'Ambiente
Regional Agency for Environment Protection



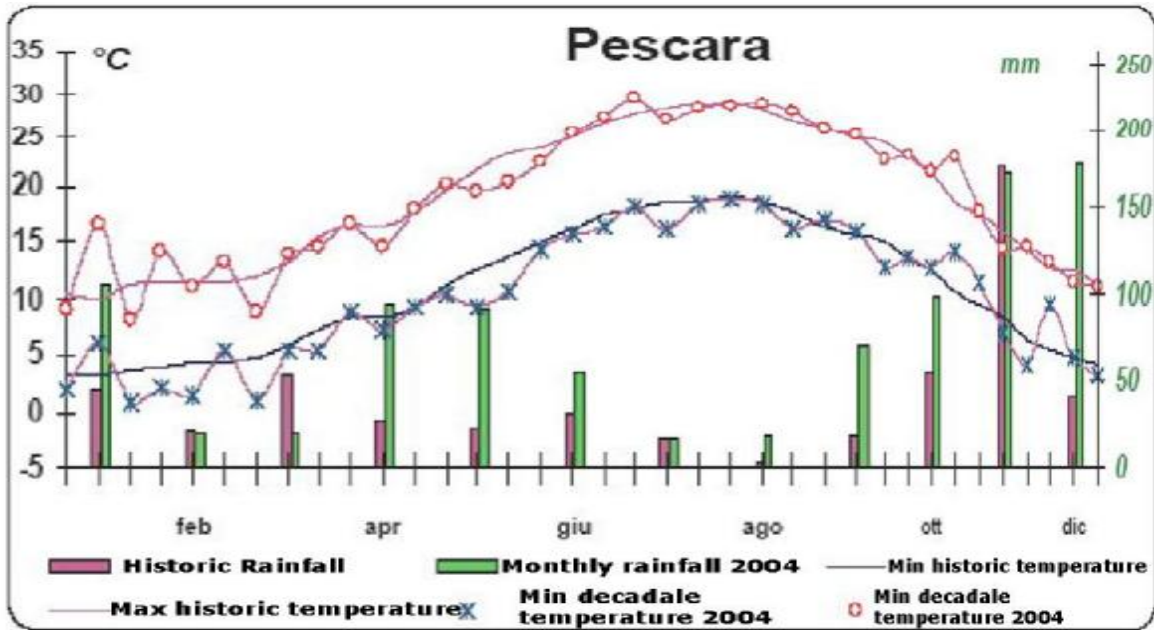
Regione Abruzzo year rainfall 2004
Source: CAR



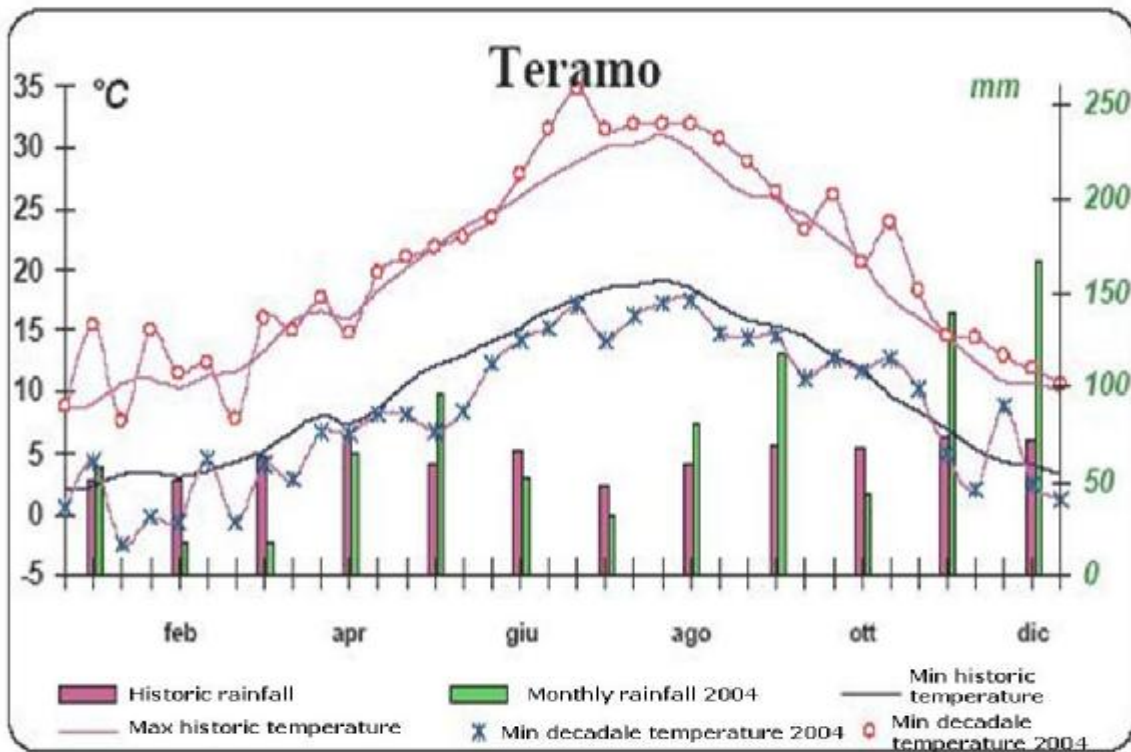
Temperatures and rainfall in L'Aquila Province in the year 2004
Source: CAR



Temperatures and rainfall in Chieti Province in the year 2004
Source: CAR



Temperatures and rainfall in Pescara Province in the year 2004
Source: CAR



Temperatures and rainfall in Teramo Province in the year 2004
Source: CAR

2.3 Agricultural area

BURGOS (SPAIN)

An agricultural description of the province of Burgos is showed in the following tables:

ARABLE LAND (ha) 2004	
Herbaceous crops	504.677
Woody crops	17.696
Fallow land	69.154
Total	591.527



RATE OF ARABLE LAND 2004	
Total arable land (ha)	591.527
Total surface (ha)	1.429.214
Rate of arable land	41,39%



ENERGY CROPS 2005-2006	
Energy crops 2005 (ha)	800
Energy crops 2006 (ha)	36.000



AVILA (SPAIN)

Agricultural area distribution (thousands Ha): (year 2004)

TOTAL	Crop Land			Field and Pasture			Forest	Other
	Dry	Irrigated	Total	Dry	Irrigated	Total		
805	165,9	21,6	187,5	228,5	19,8	248,3	250,0	119,2
	20,6%	2,6%	-	28,3%	2,4%	-	31,0%	14,8%

Note: There aren't data of energy crops

Used oil collected evolution (tn): (2000-2005)

2000	2001	2002	2003	2004	2005	Increase %
413,4	462,4	417,3	491,5	512,2	537,3	29,9%

HUELVA (SPAIN)

Agricultural area in total (Ha) (2005)	Agricultural area of energy crops (Ha) (2005)
3383	Sunflower 78 Corn 1543

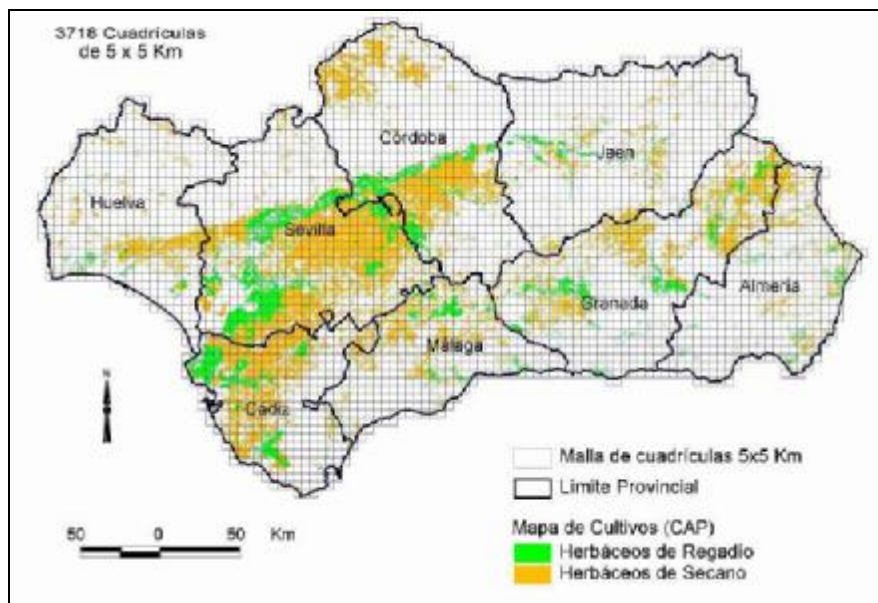


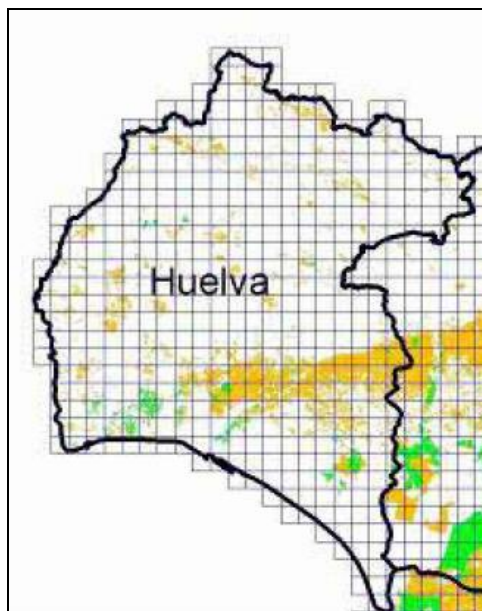
Figure.



Crops of irrigated land



Crops of unirrigated land



POMURJE (SLOVENIA)

Total surface of Pomurje region is 133.700 ha. About 77.000 ha of the region's area are in use. From that, agricultural area is 57.622 ha.

Areas in use (Pomurje)

Municipality	All areas in use		All agricultural areas in use	
	Family farms	Area (ha)	Family farms	Area (ha)
Beltinci	800	3918,66	800	3387,02
Cankova	308	2020,51	308	1608,34
Črenšovci	407	1942,7	407	1654,34
Dobrovnik/Dobronak	163	715,29	163	651,25
Gornja Radgona	962	6567,65	962	5067,05
Gornji Petrovci	456	3941,8	456	2056,18
Grad	453	2606,44	453	1614,3
Hodoš/Hodos	63	812,45	63	475,61
Kobilje	88	549,71	88	481,29
Križevci	403	3437,92	403	2739,93
Kuzma	277	1341,52	277	844,3
Lendava/Lendva	754	3357,4	754	3064,24
Ljutomer	1033	6459,53	1033	5063,33
Moravske Toplice	948	7930,43	947	5632,01
Murska Sobota	577	3317,16	577	2606,99
Odranci	220	945,61	220	821,97
Puconci	966	7350,77	965	5161,06
Radenci	328	1947,87	328	1450,68
Razkrižje	116	597,71	116	503,03
Rogašovci	529	2725,96	529	2083,48
Sveti Jurij	403	3632,8	403	2592,97

Šalovci	365	3630,94	365	2086,5
Tišina	461	3066,43	461	2559,52
Turnišče	369	1912,37	369	1716,65
Velika Polana	204	1093,99	204	946,13
Veržej	129	983,65	129	753,91
Skupaj POMURJE	11782	76807,27	11780	57622,08

Data source: Si-stat, Census of Agriculture 2000

3.501,4 ha of land fields was under beet in 2006, which is equal to 8,14 % of all land areas. Harvesting beet for production of sugar in the Sugar Factory (Plant) in Ormož, came to an end in 2006, because the Plant was closed. The 8,14% of the field will thus be free for other crops. And an option is to grow other energy crops on the area.

Areas (field) under beet 2006

Municipality	Area (ha) under beet in 2006
Beltinci	227.73
Cankova	127.93
Črenšovci	58.19
Dobrovnik	36.42
Gornja Radgona	259.72
Gornji Petrovci	
Grad	1
Hodoš	5
Kobilje	31.09
Križevci	190.99
Kuzma	2.28
Lendava	330.99
Ljutomer	366.67
Moravske Toplice	335.05
Murska Sobota	659.8
Odranci	22.88
Puconci	295.65
Radenci	20.6
Razkrižje	15.1
Rogašovci	46.82
Sveti Jurij	64.62
Šalovci	30.13
Tišina	178.53
Turnišče	64.78
Velika Polana	28.44
Veržej	100.99
Total	3 501.4

Data source: Sugar Factory (plant), joint stock company

Intended use and surface of cultures and crops in Pomurje

Intended use (Pomurje)	Surface (ha)
Fields and gardens	43.001,66
Production cereals	31.626,55
Industrial plants	5.365,69
Feed plants	4.415,55
Vegetables	321,61
Pasture	11.530,34

Culture / crop (Pomurje)	Surface (ha)
Wheat	13.805,47
Barley	3.447,23
Corn for grains	12.691,01
Corn for silage (feed)	3.252,17
Potatoes	1.032,26
Pumpkin for oil	1.400,57
Beet	3.911,01

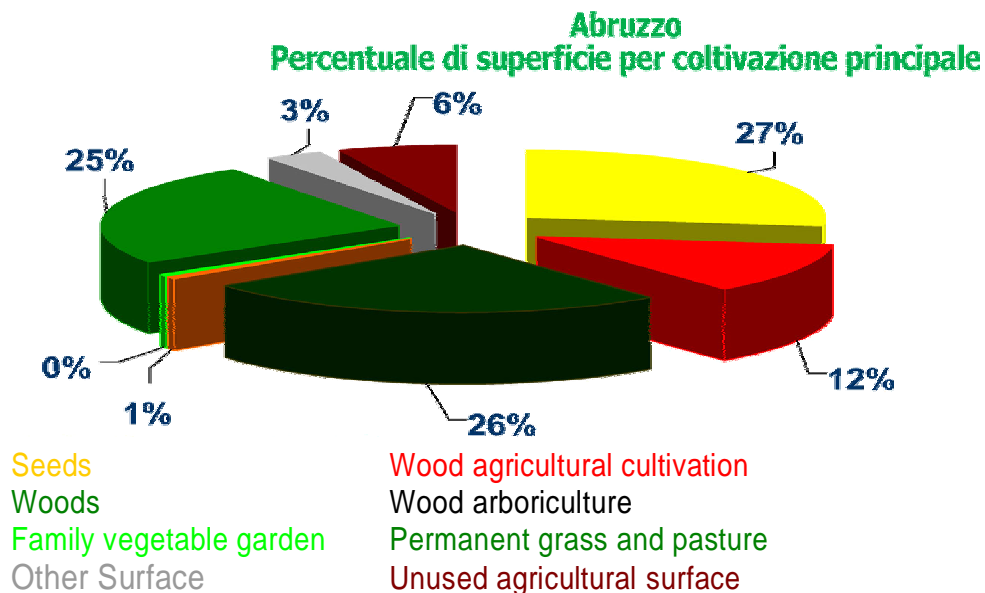
Data source: Si-stat, Census of Agriculture 2000

The Republic of Slovenia has got realivly far conditions for oilseed rape growing. In the period from 1980 to 1990 the country has grown oilseed rape on 2.000 to 2.500 hectares. In 2004 2.500 hectares was under oilseed rape. According to estimations of

the Ministry of Agriculture, the maximum available and appropriate agricultural surface for growing oilseed rape is 7.000 to 20.000 hectares.

ABRUZZO (ITALY)

REGIONE ABRUZZO PERCENTAGE OF SURFACE OF MAIN CULTIVATION



Source: University of L'Aquila, Faculty of Engineering

The historical analysis of these data shows the following:

- Mountain area depopulation trend;
- increase of artificial areas: 68%
- Decrease of agricultural areas: 39%
- Increase of forest areas: 28%
- The provinces of Chieti, Pescara and Teramo have a territory of agricultural prevalence
- The province of L'Aquila has a territory of forest prevalence

In the following charts there are the data regarding the agricultural area in Regione Abruzzo, the number of farms, the total surface and the available surface. The data are divided into the 4 provinces L'Aquila, Teramo, Pescara, Chieti and into the municipalities of each province.

Concerning energy crops, after a long research carried on at the Regional Statistical Offices, Biodiesel Producers, Faculty of Agriculture and Regione Abruzzo Councillorship of Agriculture we discovered that we do not have any official data at a regional level.

Region	Number of farms	Total surface	Available surface
Abruzzo	82.833	669.915	432.040

The cultivations of seeds prevail on the coast and hills of Teramo Province and in some areas of Chieti and L'Aquila Provinces where the percentage of available surface dedicated to this cultivation is between 67 % and 99%. In Pescara Province the percentage is between 34% and 66%.

Provinces	Number of farms	Total surface	Available surface
L'Aquila	12.504	318.680	175.582
Teramo	17.780	119.756	84.707
Pescara	15.540	79.000	57.946
Chieti	37.009	152.477	113.805
Totale	82.833	669.915	432.040

L'AQUILA PROVINCE

Municipality	Number of farms	Total surface	Available surface
Acciano	033	1.600	1.027
Aielli	120	1.716	890
Alfedena	019	3.309	2.607
Anversa degli Abruzzi	045	3.291	2.885
Ateleta	072	1.233	555
Avezzano	457	2.008	1.955
Balsorano	323	4.693	2.090
Barete	043	1.328	1.050
Barisciano	103	4.611	3.237
Barrea	025	4.863	3.096
Bisegna	008	5.060	1.326
Bugnara	220	1.313	857
Cagnano Amiterno	093	7.926	1.562
Calascio	014	3.077	2.905
Campo di Giove	010	2.368	1.152
Campotosto	036	1.962	1.694
Canistro	082	812	407

Cansano	005	2.921	885
Capestrano	110	2.375	1.228
Capistrello	054	4.227	842
Capitignano	039	1.048	308
Caporciano	032	960	757
Cappadocia	009	6.140	2.157
Carapelle Calvisio	015	911	674
Carsoli	093	2.538	1.331
Castel del Monte	015	4.727	3.910
Castel di Ieri	026	1.140	696
Castel di Sangro	055	4.951	2.600
Castellafiume	033	1.718	381
Castelvecchio Calvisio	032	970	133
Castelvecchio Subequo	108	1.310	1.006
Celano	784	4.971	4.182
Cerchio	072	740	740
Civita d'Antino	051	1.798	838
Civitella Alfedena	010	1.061	176
Civitella Roveto	130	2.537	725
Cocullo	032	2.433	2.232
Collarmele	067	1.701	1.692
Collelongo	069	4.541	693
Collepietro	018	1.367	1.110
Corfinio	044	738	387
Fagnano Alto	012	962	666
Fontecchio	035	1.068	596
Fossa	056	468	371
Gagliano Aterno	009	2.270	1.445
Gioia dei Marsi	119	5.499	2.534
Goriano Sicoli	071	1.341	1.151
Introdacqua	056	2.515	1.278
L'Aquila	1.543	23.847	17.198
Lecce nei Marsi	030	4.838	563
Luco dei Marsi	384	4.630	2.320
Lucoli	129	7.335	4.048
Magliano de' Marsi	268	4.725	2.545
Massa d'Albe	165	3.984	3.261
Molina Aterno	008	619	324
Monte Reale	140	2.298	2.000
Morino	033	2.384	096
Navelli	114	2.779	2.394
Ocre	007	235	230
Ofena	124	2.323	1.837
Opi	033	3.923	1.080
Oricola	020	972	507
Ortona dei Marsi	182	1.456	721
Ortucchio	506	2.982	1.701
Ovindoli	021	4.211	1.444

Pacentro	074	4.317	1.525
Pereto	012	3.442	1.592
Pescasseroli	032	8.595	3.026
Pescina	202	2.451	2.069
Pescocostanzo	059	4.845	2.881
Pettorano sul Gizio	054	3.898	1.904
Pizzoli	103	4.135	2.131
Poggio Picenze	117	509	331
Prata d'Ansidonia	054	1.401	1.001
Pratola Peligna	358	1.823	1.642
Prezza	237	1.137	973
Raiano	350	1.851	1.335
Rivisondoli	018	2.410	1.574
Roccacasale	120	1.097	680
Rocca di Botte	037	2.476	785
Rocca di Cambio	007	1.984	944
Rocca di Mezzo	046	6.542	2.583
Rocca Pia	014	3.478	2.579
Roccaraso	054	4.285	2.675
San Benedetto dei Marsi	389	2.088	1.984
San Benedetto in Perillis	048	1.072	792
San Demetrio ne' Vestini	074	861	662
San Pio delle Camere	052	1.126	938
Sante Marie	081	2.066	1.115
Sant'Eusanio Forconese	058	516	398
Santo Stefano di Sessanio	013	2.521	1.783
San Vincenzo Valle Roveto	198	3.274	1.807
Scanno	023	6.403	5.912
Scontrone	038	1.375	589
Scoppito	089	3.582	1.334
Scurcola Marsicana	239	1.843	1.597
Secinaro	037	2.301	489
Sulmona	543	3.087	2.133
Tagliacozzo	153	3.946	2.839
Tione degli Abruzzi	013	2.276	633
Tornimparte	145	5.285	2.084
Trasacco	337	3.539	2.055
Villalago	015	3.463	1.941
Villa Santa Lucia degli Abruzzi	050	1.954	837
Villa Sant'Angelo	048	271	156
Villavallelonga	077	5.687	867
Villetta Barrea	012	1.607	557
Vittorito	153	1.209	557
Total	12.504	318.680	175.582

TERAMO PROVINCE

Municipality	Number of farms	Total surface	Available surface
Alba Adriatica	166	721	616
Ancarano	202	925	827
Arsita	202	2.991	1.960
Atri	1.012	8.156	6.379
Basciano	327	1.257	857
Bellante	576	4.081	3.563
Bisenti	379	1.947	1.390
Campoli	939	5.016	3.622
Canzano	253	1.361	1.168
Castel Castagna	117	1.301	948
Castellalto	490	2.822	2.280
Castelli	093	1.979	811
Castiglione Messer Raimondo	343	2.382	1.954
Castilenti	231	1.764	1.196
Cellino Attanasio	394	2.810	2.225
Cermignano	342	1.203	920
Civitella del Tronto	637	3.060	2.328
Colledara	253	865	677
Colonnella	363	1.344	1.211
Controguerra	432	1.591	1.383
Corropoli	469	1.748	1.605
Cortino	093	4.315	1.862
Crognaleto	191	6.929	1.773
Fano Adriano	017	527	302
Giulianova	540	1.464	1.313
Isola del Gran Sasso d'Italia	347	6.997	3.621
Martinsicuro	176	720	577
Montefino	202	1.432	1.123
Montorio al Vomano	630	2.484	1.718
Morro d'Oro	330	2.041	1.822
Mosciano Sant'Angelo	806	3.946	3.519
Nereto	174	402	364
Notaresco	481	2.241	1.955
Penna Sant'Andrea	155	719	462
Pietracamela	010	2.227	948
Pineto	527	2.584	2.180
Rocca Santa Maria	132	5.529	3.370
Roseto degli Abruzzi	939	3.508	3.078
Sant'Egidio Alla Vibrata	430	1.172	1.088
Sant'Omero	417	1.917	1.806
Silvi	259	1.141	1.013
Teramo	1.552	8.273	6.661
Torano Nuovo	274	1.047	965
Torricella Sicura	197	2.603	1.771

Tortoreto	331	1.186	1.096
Tossicia	200	1.062	463
Valle Castellana	150	3.964	1.936
Totale	17.780	119.756	84.707

PESCARA PROVINCE

Municipality	Number of farms	Total surface	Available surface
Abbateggio	066	643	274
Alanno	421	1.989	1.778
Bolognano	128	850	646
Brittoli	090	880	478
Bussi sul Tirino	124	1.129	583
Cappelle sul Tavo	114	285	268
Caramanico Terme	082	3.514	1.394
Carpineto della Nora	129	1.773	933
Castiglione a Casauria	269	577	462
Catignano	277	1.375	1.105
Cepagatti	775	2.022	1.895
Citta' Sant'Angelo	1.007	5.314	4.537
Civitaquana	341	1.468	1.245
Civitella Casanova	275	2.439	1.885
Collecervino	970	2.520	2.285
Corvara	080	913	638
Cugnoli	290	1.032	941
Elice	394	1.107	872
Farindola	239	2.770	1.110
Lettomanoppello	114	937	303
Loreto Aprutino	1.283	5.161	4.628
Manoppello	741	2.413	1.790
Montebello di Bertona	152	1.507	957
Montesilvano	480	967	831
Moscufo	548	1.721	1.560
Nocciano	279	1.056	989
Penne	1.182	7.895	6.260
Pescara	570	655	543
Pescosansonesco	113	1.255	651
Pianella	1.058	3.961	3.742
Picciano	212	758	617
Pietranico	121	932	759
Popoli	086	3.572	1.378
Roccamorice	046	947	452
Rosciano	465	1.893	1.625
Salle	013	092	089
Sant'Eufemia a Maiella	020	2.472	1.260
San Valentino in Abruzzo Cite	154	721	497

Scafa	117	398	266
Serramonacesca	043	770	734
Spoltore	701	2.818	2.511
Tocco da Casauria	538	1.484	884
Torre de' Passeri	052	217	193
Turrivalignani	084	202	141
Vicoli	137	710	485
Villa Celiera	160	887	473
Total	15.540	79.000	57.946

CHIETI PROVINCE

Municipality	Number of farms	Total surface	Available surface
Altino	401	768	615
Archi	486	1.891	1.270
Ari	336	1.046	720
Arielli	191	759	665
Atessa	1.176	7.840	6.868
Bomba	124	607	329
Borrello	022	501	336
Bucchianico	724	2.469	2.160
Canosa Sannita	254	920	779
Carpineto Sinello	192	1.023	657
Carunchio	110	447	294
Casacanditella	212	650	506
Casalanguida	255	1.255	1.101
Casalbordino	904	3.299	2.950
Casalincontrada	342	1.222	931
Casoli	1.058	5.247	4.481
Castel Frentano	451	1.424	1.316
Castelguidone	100	502	249
Castiglione Messer Marino	230	1.678	932
Celenza sul Trigno	245	1.259	898
Chieti	1.362	2.697	2.235
Civitaluparella	009	1.116	549
Civitella Messer Raimondo	209	496	152
Colledimacine	010	060	054
Colledimezzo	014	332	077
Crecchio	582	1.704	1.458
Cupello	932	3.546	3.407
Dogliola	134	644	370
Fallo	002	300	170
Fara Filiorum Petri	177	718	521
Fara San Martino	187	3.370	2.028
Filetto	160	739	541
Fossacesia	634	2.007	1.759

Fraine	047	460	186
Francavilla al Mare	761	1.691	1.444
Fresagrandinaria	377	1.545	1.164
Frisa	378	1.025	939
Furci	293	2.142	2.036
Gamberale	029	1.973	913
Gessopalena	454	1.465	918
Gissi	369	1.861	1.630
Giuliano Teatino	293	812	632
Guardiagrele	397	1.817	1.443
Guilmi	049	291	116
Lama dei Peligni	155	1.294	212
Lanciano	2.114	4.281	3.887
Lentella	182	895	732
Lettopalena	022	1.389	783
Liscia	218	720	480
Miglianico	647	1.560	1.383
Montazzoli	152	1.844	1.282
Montebello sul Sangro	005	198	107
Monteferrante	008	271	083
Montelapiano	007	292	268
Montenerodomo	053	1.136	949
Monteodorisio	543	1.585	1.475
Mozzagogna	314	1.071	896
Orsogna	446	1.469	1.129
Ortona	2.404	4.914	4.262
Paglieta	619	2.011	1.851
Palena	039	5.773	3.119
Palmoli	328	1.503	788
Palombaro	200	1.333	665
Pennadomo	054	534	425
Pennapiedimonte	098	3.779	799
Perano	230	397	325
Pietraferrazzana	003	104	012
Pizzoferrato	083	1.721	809
Poggiofiorito	194	626	556
Pollutri	542	2.101	1.873
Pretoro	107	1.240	482
Quadri	006	113	050
Rapino	204	328	243
Ripa Teatina	491	1.593	1.396
Roccamontepiano	273	955	520
Rocca San Giovanni	491	1.427	1.070
Roccascalegna	346	1.549	1.081
Roccaspinalveti	470	3.085	1.412
Roio del Sangro	002	360	080
Rosello	013	918	594
San Buono	304	1.299	915

San Giovanni Lipioni	077	276	117
San Giovanni Teatino	447	709	544
San Martino sulla Marrucina	158	431	320
San Salvo	544	878	859
Santa Maria Imbaro	138	425	388
Sant'Eusanio del Sangro	403	1.559	1.478
San Vito Chietino	731	1.483	1.154
Scerni	944	3.525	3.239
Schiavi di Abruzzo	431	972	234
Taranta Peligna	019	1.630	1.409
Tollo	615	1.995	1.815
Torino di Sangro	663	2.563	2.323
Tornareccio	179	1.482	1.046
Torrebruna	206	439	234
Torrecchia Teatina	497	1.106	949
Torricella Peligna	206	1.799	1.467
Treglio	158	263	204
Tuffillo	151	1.056	443
Vacri	294	1.107	908
Vasto	1.379	3.289	3.024
Villalfonsina	278	728	641
Villamagna	396	1.130	1.029
Villa Santa Maria	056	342	189
Total	37.009	152.477	113.805

Cultivations 2005 Regione ABRUZZO

As it was previously stated, there are no available data on energy crops, but it is interesting to point out the production of those cultivations that could potentially be used for biodiesel production.

Cultivation	Total surface	Production per ha	Total production in quintals
Oil seeds	4.487	19,1	85.731
Rape	3	7,0	21
Sunflower	4.391	18,9	82.900
Soya	93	30,2	2.810

Data updated in May 2006

3. PRODUCTION OF BIODIESEL IN THE ANALYZED REGIONS

3.1 Present biodiesel production in the region

BURGOS (SPAIN)

At the moment there is not any biodiesel production plant working in the area of Burgos. The main supplier of the petrol stations and other consumers is the Biodiesel Plant of Bionor Transformación, S.A., located on the industrial estate of Lacorzanilla, in the province of Alava. This plant was opened in May 2003 and the construction of its installations as well as its commissioning amounted to an investment of 11 million euro, directly creating 20 jobs and about one hundred indirectly. The annual production capacity of the plant is 30.000 tonnes, starting from vegetable oil, both raw and used, as well as other renewable materials. The plant has almost 50 different used oil suppliers in Spain. The future enlargement of the installations will be expected to produce 104.000 tonnes of biodiesel per year.



Biodiesel production plant of Bionor in Berantevilla

AVILA (SPAIN)

At this moment there isn't production of Biodiesel in the province of Avila, a part of the product sold is from (data source ANELI):

- Bionor: situated at Berantevilla (Álava, Spain)
- Biocarburantes Castilla la Mancha: situated at Santa Olalla (Toledo, Spain)

HUELVA (SPAIN)

At the moment biodiesel plants don't exist in the area of Huelva. Two new plants are being built.

There are 15 petrol stations that sell biodiesel in our region, the producer is Bionor Transformation INC and the main distributor is Via Oil Operator S.L.U, Decal and Disagón.

The plant of biodiesel production from which the biodiesel is distributed in our region is located in Álava and it is marketing the biodiesel from the port of Bilbao and the port of Huelva, since there it is where they are made in Port Terminals the mixtures with gasoil.

POMURJE (SLOVENIA)

There is high (technological) potential for production of alternative fuels: biodiesel or raw vegetable oil in Slovenia. The input for production of biodiesel and raw vegetable oil is oil, processed with cold extraction of oilseed rape or sunflowers.

Photo: Oilseed rape



Photo: B. Žajdela

The only production plant of biodiesel in Pomurje is located in Gančani, Municipality Beltinci. The owner of the plant is sole entrepreneur Jožef Jerič, with the company Intercorn Trading. The input for his production is – oilseed rape. Current capacity of processing oilseed rape to oil is 6.000 tons of oilseed rape. This means 2000 tons of oil. Processing capacity of oil to biodiesel is about 1.800 tons a year. Additionally, the company processes also about 100 tons of bio fuel (heating) oil. From processing fat, tallow and disposable oil, the company produces about 2.200 tons of biodiesel.

The entrepreneur foresees further growth of processing oilseed rape to oil, oil refining, setting up catalytic converter, processing oilseed rape to methyl esters of fatty acid and glycerine on the basis of synthesis, raw input storage, semi-products and final products.

In future, the entrepreneur also projects investment in cogeneration aggregate with electricity power of about 50 kW. Thus he plans to produce about 300.000 kWh of electricity a year.

The following table presents foreseen dynamics of yearly energy crops growing in Slovenia for production of biodiesel from 2006 to 2010.

Foreseen energy crops area for biodiesel production in Slovenia

Year	2006	2007	2008	2009	2010
Surface (ha)	2.500	2.500	3.000	3.000	3.500
Fats (t)	15.000	15.000	18.000	18.000	21.000

Vir: <http://www.gov.si/mop/dokumenti/etm%202005-3.doc>

By calculating the estimated national production of raw inputs it was taken into consideration ecological production of oilseed rape with average output 1.800 kg seeds per hectare (ha), and 33% fat content in the seeds.

There are no bio ethanol production plants or refinery / plants for mixing imported bio ethanol with petrol.

ABRUZZO (ITALY)

The only biodiesel production plant in Regione Abruzzo is located in Località Punta Penna VASTO, in the Province of Chieti (see map below) and the name of the producer is Fox Petroli.

In 1993 Fox Petroli has acquired one vegetable oils refinery in Vasto (CH), Regione Abruzzo, Italy. Such plant has been completely restructured and next to it, it has been constructed a Biodiesel plant. It rises on a surface of 33,000 square meters. It is connected to the sea by two oil pipe-lines, one of which heated for the transfer of high temperature products. Inside there is a system of vegetable oils refining with a productive capacity of 140.000 tons./year and a biodiesel production system with the productive capacity of approximately 120.000 tons/year. This product is

commercialized and used as fuel just like other oil products. Moreover from the production of the biodiesel there are some by-products such as oleins and the glycerin that are sold both in Italy and abroad.

3.2 Trends respect previous year

BURGOS (SPAIN)

At the moment there is not any biodiesel production plant working in the area of Burgos.

The first biodiesel production plant of the province is now being built. Its construction began on February 2007 in the municipality of Villahoz, and it's expected to be finished by summer 2008. The company Villahoz Energías Renovables (Green Alliance) is going to invest 16 million euro in this plant in which 21.000 tonnes of biodiesel will be annually produced using sunflower as raw material.

AVILA (SPAIN)

At this moment there isn't production of Biodiesel in the province of Avila.

HUELVA (SPAIN)

Three biodiesel plants will be built in next years in the Huelva area, two of those which are in progress already and they will have a superior production to 450.000 Tons of this product.

Two biodiesel plants will enter in operation in 2008 in the county of Huelva: Bionor South and Bio Oils Energy, both in Palos de la Frontera (Huelva).

The first biodiesel plant "Bionor Sur" will begin their activity in April of 2008. This plant will use virgin oil of soya and of palm. He will have an annual production of some 300.000 tons.

The second plant of biodiesel is a property of the company Bio Oils and it will be located in Palos de la Frontera. It will have a capacity of annual production of 250.000 tons.

There are 3 projects of construction of biodiesel plants at the moment in the Huelva county, although they are in an incipient phase.

According to the data of La Junta de Andalucía, 20 projects of biodiesel plants exist at the moment in Andalucía.

POMURJE (SLOVENIA)

Another biodiesel plant is to be built in Pomurje region. A new established subsidiary company Nafta Biodiesel, operated under umbrella of Nafta Lendava, is planning to build the biggest biodiesel plant in Slovenia..

The planned biodiesel plant will be built at the site of the former refinery. The opening is planned for the beginning of 2008. The aggregate value of the investment is 22,2 million euro. The capacity of 60.000 tons of biodiesel will represent 88 percent of all biodiesel production in Slovenia and 1 percent of EU production. Slovenia will thus fulfill EU biodiesel requirements.

Every year, additional 6.000 tons of methanol will be processed for the needs of biodiesel production. Thus 7,5 times more biodiesel will be produced in Slovenia in comparison to 2005. Initially, the raw inputs will be imported, because the growing area of oilseed rape in Slovenia doesn't meet needs for the plant. The company offers possibility to grow 7.000 to 20.000 ha of oilseed rape in Slovenia. The company reckons to cover half of the production (30.000 tons) of biodiesel from domestic inputs in the future. But this energy crop will not be the only input for the newly planned biodiesel plant. For production of biodiesel will be used also disposable edible oil.

Using biodiesel, produced by the planned plant, all vehicles in Slovenia will be able to drive 1.500 km a year. This is how biodiesel production as an alternative energy source will make a major contribution to the conservation of a healthy and clean natural environment. The implementation of the project will considerably lower greenhouse gas emissions of Slovenia, representing an important contribution to the implementation of

the Kyoto Protocol and the European Biofuel Directive. The production of Slovenian biodiesel is also an opportunity for restructuring the domestic agriculture.

ABRUZZO (ITALY)

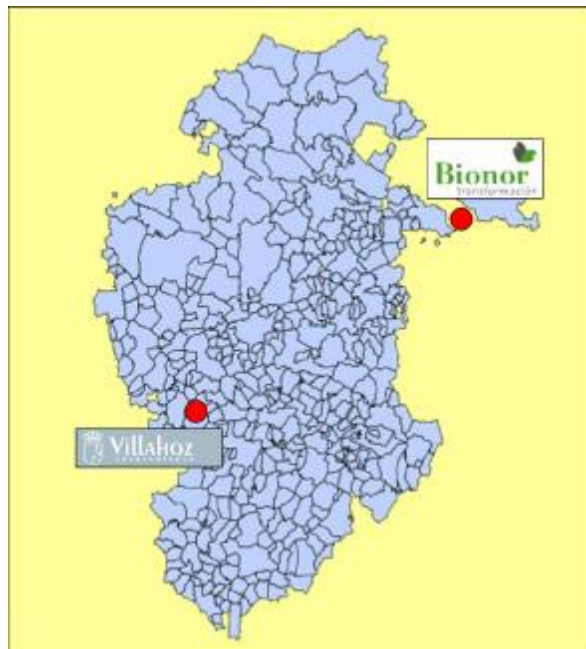
In 2006 the production was 130.000 Tonn, in 2007, 150.000 Tonn and it is foreseen for 2008/2010 about 250.000 Tonn

3.3 Maps and localizations

BURGOS (SPAIN)

The main supplier of the petrol stations and other consumers is the Biodiesel Plant of Bionor Transformación, S.A., located on the industrial estate of Lacorzanilla, in the province of Alava.

The location of both plants is showed in the following map:



Location of the biodiesel production plants (Villahoz plant still in construction)

Moreover, there are other different projects for the construction of new plants in the municipalities of Briviesca and Castrojeriz, but these projects are still being studied.

AVILA (SPAIN)

Not applicable.

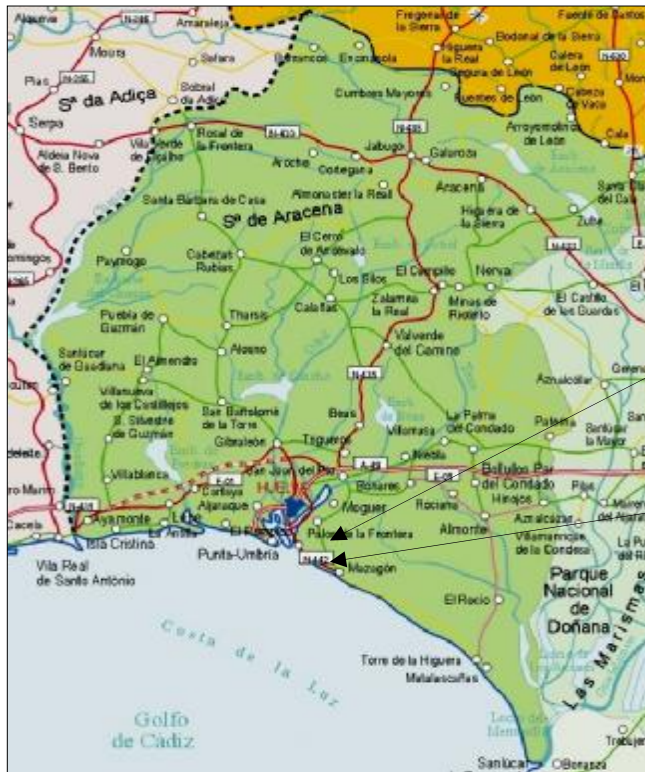
HUELVA (SPAIN)

Bio Oils : Polígono Industrial Nuevo Puerto. Palos de la Frontera Huelva

<http://www.bio-oils.com>

Bionor Sur:

<http://www.bionor.es>



BIONOR SUR

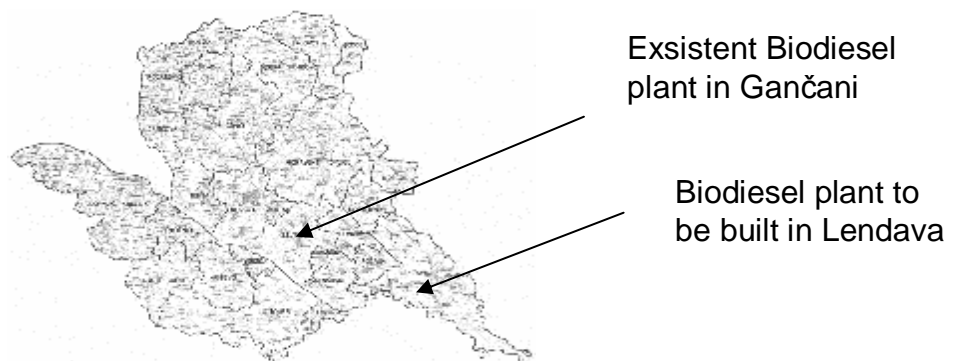
BIO OILS ENERGY

POMURJE (SLOVENIA)

Biodiesel plant and production system in Gančani, Pomurje region



Photo: LEA Pomurje



ABRUZZO (ITALY)



Picture of Biodiesel Plant



4. CONSUMPTION OF BIODIESEL IN THE ANALYZED REGIONS

4.1 Vehicles in transport

BURGOS (SPAIN)

The total number of vehicles used for transport in the province of Burgos (year 2005) is showed in the following table:

VEHICLES IN THE PROVINCE OF BURGOS (2005)						
Lorries and vans	Buses	Cars	Motorbikes	Industrial tractors	Other vehicles	TOTAL
34.785	451	163.303	8.018	3.091	8.951	218.599

In the province of Burgos, biodiesel is mainly used by the following groups of vehicles:

- Municipal fleet of vehicles in Burgos City: public transport (buses), vans and other municipal vehicles. This is one of the measures carried out by the City Council in the CIVITAS Program (sustainable transport and mobility).
- Lorries and industrial vehicles of some construction, transport and public work companies. The use of biofuels is highly appreciated in their Environmental Management Systems.
- Several private vehicles through the biodiesel petrol stations.

AVILA (SPAIN)

VEHICLES IN THE PROVINCE OF AVILA (2005)						
Lorries and vans	Buses	Cars	Motorbikes	Industrial tractors	Other vehicles	TOTAL
23.376	128	72.920	4.178	875	4.108	105.585

HUELVA (SPAIN)

Vehicles that usually consume biodiesel:

Municipality	Tourisms	Goods Road vehicles	Passenger Cars	Tractors	Vans	Others
Alájar	247	46	-	-	74	4
Aljaraque	5.351	386	-	35	429	109
Almendro (El)	222	48	-	-	30	4
Almonaster la Real	659	88	10	-	155	14
Almonte	6.137	963	55	23	1.392	255
Alosno	1.268	183	1	8	162	35
Aracena	2.479	452	24	19	406	86
Aroche	811	134	1	7	227	15
Arroyomolinos de León	313	36	-	3	68	9
Ayamonte	5.823	484	5	7	562	69
Beas	1.573	178	3	28	235	49
Berrocal	118	28	-	-	56	1
Bollulllos Par del Condado	4.476	680	-	38	966	136
Bonares	1.675	237	1	46	375	111
Cabezas Rubias	311	39	11	5	73	16
Cala	505	58	-	12	116	27
Calañas	1.326	162	7	17	232	33
Campillo (El)	856	84	1	4	95	11
Campofrío	317	34	4	8	63	17
Cañaveral de León	112	22	-	1	33	3
Cartaya	4.555	786	4	55	715	213
Castaño del Robledo	60	12	-	-	17	2
Cerro de Andévalo (El)	606	96	8	-	137	11
Chucena	599	55	-	-	142	7
Corteconcepción	239	32	-	1	43	9
Cortegana	1.543	197	1	1	346	20
Cortelazor	94	15	-	-	15	1
Cumbres de Enmedio	22	-	-	-	4	2
Cumbres de San Bartolomé	168	12	-	-	23	0
Cumbres Mayores	694	118	4	11	139	21
Encinasola	405	58	1,0	-	91	15
Escacena del Campo	742	80	-	8	113	24
Fuenteheridos	234	22	0	-	39	5
Galaroza	555	80	-	2	132	13
Gibraleón	3.405	450	3	59	482	133
Granada de Río-Tinto (La)	84	7	-	-	15	2
Granado (El)	224	18	-	-	32	2
Higuera de la Sierra	437	77	-	6	95	23
Hinojales	159	10	-	-	34	1
Hinojos	1.300	132	-	5	300	35
Huelva	60.675	4.529	324	431	4.975	1.271
Isla Cristina	5.590	662	4	3	618	117
Jabugo	903	116	-	12	130	22
Lepe	6.900	1.211	52	83	1.180	237
Linares de la Sierra	100	19	-	1	21	4
Lucena del Puerto	725	198	2	27	197	54
Manzanilla	698	120	-	12	177	29
Marines (Los)	126	29	-	-	28	5
Minas de Riotinto	1.930	146	1	16	153	68
Moguer	5.484	944	25	109	745	230
Nava (La)	126	14	-	3	23	6
Nerva	2.042	316	1	24	295	54

Niebla	1.440	145	-	177	204	134
Palma del Condado (La)	3.090	417	2	51	407	107
Palos de la Frontera	3.341	741	25	94	576	276
Paterna del Campo	1.293	117	7	7	358	34
Paymogo	374	55	7	-	98	8
Puebla de Guzmán	1.061	146	4	9	185	33
Puerto Moral	86	16	-	-	14	1
Punta Umbría	3.648	506	2	3	469	109
Rociana del Condado	2.099	324	2	7	446	37
Rosal de la Frontera	575	103	-	4	143	20
San Bartolomé de la Torre	1.051	164	2	9	152	46
San Juan del Puerto	2.407	287	1	46	311	99
San Silvestre de Guzmán	237	26	2	-	42	6
Sanlúcar de Gadiana	124	20	-	-	28	2
Santa Ana la Real	181	30	-	-	37	3
Santa Bárbara de Casa	388	77	10	3	112	13
Santa Olalla del Cala	692	95	-	2	165	14
Trigueros	2.870	300	1,0	33	433	100
Valdelarco	81	17	-	-	20	2
Valverde del Camino	5.027	633	1	67	695	154
Villablanca	774	144	5	2	148	25
Villalba del Alcor	1.026	168	-	29	236	43
Villanueva de las Cruces	118	12	-	4	39	7
Villanueva de los Castillejos	1.016	163	29	9	186	34
Villarrasa	637	84	-	9	140	27
Zalamea la Real	1.203	151	-	-	169	18
Zufre	266	53	-	1	56	3
Sin clasificar	3	-	-	-	-	-
TOTAL IN THE REGION	171.111	19.897	653	1.696	23.074	4.995

POMURJE (SLOVENIA)

Number of vehicles used for transport in Pomurje region

Municipality	Number of passenger cars	Number of goods road vehicles	Number of tractors	Other vehicles
Beltinci	3146	118	915	416
Cankova	823	30	367	121
Črenšovci	1520	69	509	292
Dobrovnik/Dobronak	477	7	229	59
Gornja Radgona	5102	246	835	784
Gornji Petrovci	798	21	529	118
Grad	846	19	449	120
Hodoš/Hodos	97	2	102	14
Kobilje	210	2	128	29

Križevci	1445	68	412	322
Kuzma	615	16	278	90
Lendava/Lendva	4495	143	1025	1031
Ljutomer	4800	258	901	973
Moravske Toplice	2453	71	1199	340
Murska Sobota	8526	548	711	1241
Odranci	555	26	318	113
Puconci	2397	70	997	351
Radenci	2375	101	300	336
Razkrižje	501	15	178	96
Rogašovci	1228	30	641	182
Sveti Jurij	1169	40	349	214
Šalovci	470	3	384	57
Tišina	1728	53	507	294
Turnišče	1206	31	493	173
Velika Polana	615	26	312	168
Veržej	583	29	159	208
Total POMURJE	48.180	2.042	13.227	8.142

ABRUZZO (ITALY)

Number of vehicles used for transport in Regione Abruzzo YEAR 2005

CARS	BUSES	TRUCKS	TRACTORS	TOTAL
781.952 (244.118 diesel)	3.160	98.988	3.757	887.857

MOTORCYCLES	TRICARS	TOTAL
102.158	7.176	109.334

OTHER VEHICLES

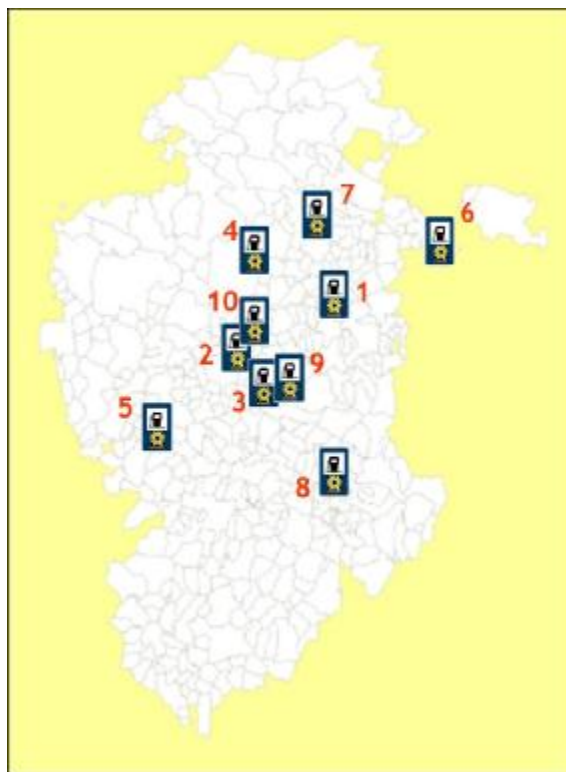
14.501

4.2 Consumption of fuels for transport

BURGOS (SPAIN)

According to the Register of Petrol Stations periodically published by the Ministry of Industry (www.mityc.es), the list of biodiesel-petrol stations in the province of Burgos is the following:

	Petrol Station (name)	Location
1	Norpetrol	Briviesca
2	Repostar-Las Terrazas	Burgos
3	El Vox	Burgos
4	E.S. Las Brujas	Cernégula
5	Valcarce	Estépar
6	E-Leclerc	Miranda de Ebro
7	E.S. Angulo Oña	Oña
8	Pinaroil, S.L.	La Revilla
9	Beroil, S.L.	Rubena
10	Vivar del Cid	Vivar del Cid



Petrol station supplying biodiesel in the province of Burgos (April 2007)

According to the data obtained from the different biodiesel distributors in the province, the consumption of biodiesel and the rate of biodiesel use (year 2006) is the following:

BIODIESEL CONSUMPTION (2006)		
Type of fuel	Litres of fuel	Litres of biodiesel
GOA 4,5%	6.387.294	287.428
B 12%	3.596.565	431.588
B 20%	3.147.762	629.552
B 30%	455.312	136.594
B 100%	116.491	116.491
	TOTAL	1.601.653 litres
TOTAL DIESEL CONSUMPTION (2006) IN TRANSPORT Gasóleo A		
		501.994.118 litres
RATE OF BIODIESEL USE 2006 PROVINCE OF BURGOS		0,32 %

AVILA (SPAIN)

The main consumers of biodiesel in the province of Avila are the private vehicles as petrol station owner confirmed us.

Note 1: excluding Diesel for agricultural machinery

Note 2: average density diesel 850 kg/m³

TOTAL YEARLY CONSUMPTION OF FUELS FOR TRANSPORT (tn, year 2006)			
Petrol	Diesel	Biodiesel	TOTAL
33.041	128.114	287	161.442
20,47%	79,36%	0,18%	100%

HUELVA (SPAIN)

Main Distributors of biodiesel in the province of Huelva:

Distributor:

Producer:

-Vía Oil (Vía operador petrolífero)

Bionor

-Disagón

Bionor

-Decal

Bionor

Quantity and type of biodiesel distributed by each one:

Vía Oil and Disagón: Bionor are making the mixture to: 30%

Decal is making the mixture to 4.5%, 5%, 12%, 30%, 50%

The quantity of distributed biodiesel will be the quantity of biodiesel sold in each petrol station: 365.000litres/month

Bionor 353.000 litres

Decal 12.000 litres

Number of petrol satitions that supply biodiesel and location:

PASTOR FRANCO, S.L. (Las Cumbres)

Consumption: 6000 l/month

E.S. LA NAVA DE HUELVA

Consumption: 45.000-50.000 l/month

E.S. EL CAMPILLO DE HUELVA

Consumption: Petrol station will begin to sell soon.

E.S. EL ROCÍO

Consumption: 25.000-30.000 l/month

E.S. PUERTA DOÑANA

Consumption: 30.000 l/month

E.S. LA CANALIEGA (Comala S.A.)

Consumption: 15.000 l/month

E.S. PLATERO S.A.

Consumption: 130.000 l/month

E.S. NOVIGAR S.A.

Distribuidor and consumption: We don't have data

E.S. TYCSA

Consumption: 20.000 l/month

E.S. ALOSNO

Consumption: 22.000-23.000 l/month

E.S. TYCSA

Consumption: 20.000 l/month

E.S. PÉREZ RODRÍGUEZ

Consumption: We don't have data

E.S. CAPTOIL

Consumption: 12.000 l/month

E.S. GESGASÓLEO

Consumption: 30.000 l/mes

E.S. LOS PINOS DE VALVERDE

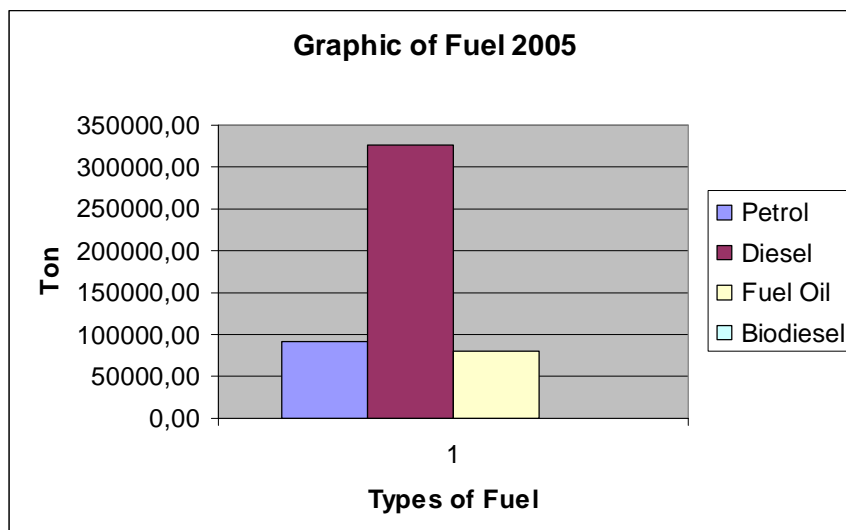
Consumption: We don't have data



YEAR 2005:

	Petrol	Diesel	Fuel oil	Total	Biodiesel
January	6440,76	23063,02	3520,99	33024,77	
February	6357,36	24663,75	13129,5	44150,61	
March	7365,02	26570,35	16502,49	50437,86	
April	7528,67	29008,73	7771,64	44309,04	
May	7704,52	30270,74	3275,58	41250,84	
June	8062,9	28716,12	5569,67	42348,69	
July	9380,66	28902,91	4551,37	42834,94	
August	10382,66	29961,69	4104,24	44448,59	
September	7883,95	26027,95	4279,95	38191,85	
October	7347,59	24404,05	5804,04	37555,68	
November	6614,99	27579,4	5812,05	40006,44	
December	7129,23	26336,48	5325,24	38790,95	
TOTAL	92198,31	325505,19	79646,76	497350,26	497,2

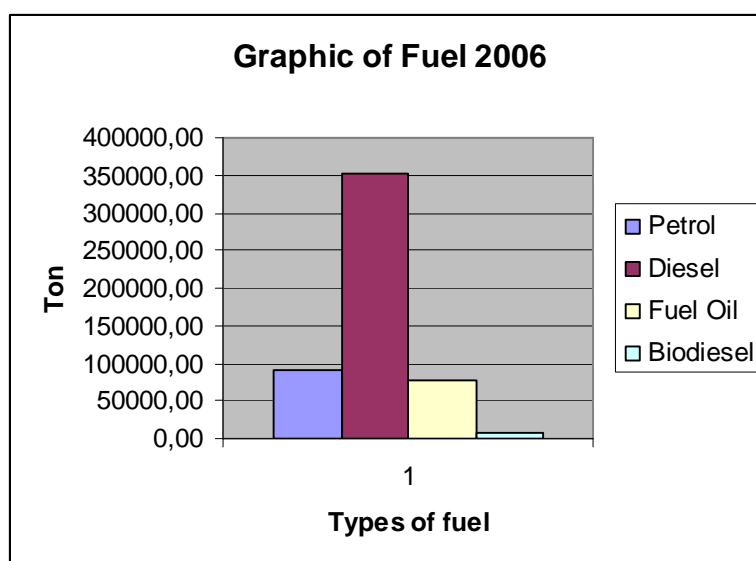
Unit: Ton



YEAR 2006:

	Petrol	Diesel	Fuel oil	Total	Biodiesel
January	6168,96	24982,86	3520,99	34672,81	
February	6345,24	25458,27	13129,5	38587,77	
March	7404,41	30764,5	8328,27	46497,18	
April	7745,68	28765,76	6094,95	42606,39	
May	8093,03	31646,82	4802,22	44542,07	
June	8238,43	36129,78	4951,32	49319,53	
July	8979,31	30044,93	6825,38	45849,62	
August	9844,75	32149,58	6835,61	48829,94	
September	7986,94	28725,8	5966,29	42679,03	
October	7055,69	26700,95	7582,43	41339,07	
November	6535,47	26484,40	6528,2	39548,07	
December	7329,39	29899,72	3376,45	40605,56	
TOTAL	91727,30	351753,37	77941,61	515077,04	8274,413

Unit: Ton



POMURJE (SLOVENIA)

According to available data on registered vehicles, kilometers driven and average kilometers driven in Slovenia, the Local Energy Agency has calculated total yearly consumption of petrol and diesel, which is presented in the following table.

CONSUMPTION OF ENERGY IN TRANSPORT (2005)		
Type of fuel	Litres of fuel	MWh
Petrol	49.954.809	499.548
Diesel	31.296.155	309.462

Data about consumption of biodiesel in Pomurje region is not registered and thus not available. But from the production point of view and according to estimations of the Intercom Trading Jožef Jerič s.p. the consumption in the region was about 350.000 l in 2006.

ABRUZZO (ITALY)

Total year consumption of petrol in Regione Abruzzo from 2001 to 2005

	2001	2002	2003	2004	2005
REGIONE ABRUZZO	339	320	319	305	282

The data is expressed in thousands of tons

Total year consumption of unleaded petrol in Regione Abruzzo from 2001 to 2005

	2001	2002	2003	2004	2005
REGIONE ABRUZZO	361.242	432.288	431.472	412.162	381.081

The data is expressed in thousands of tons

Total year consumption of diesel (for cars) in Regione Abruzzo from 2001 to 2005

	2001	2002	2003	2004	2005
REGIONE ABRUZZO	304	319	360	395	403

The data is expressed in thousands of tons

Distribution network in Regione Abruzzo from 2001 to 2005

	2001	2002	2003	2004	2005
REGIONE ABRUZZO	579	492	612	597	598

The data is expressed in number of petrol stations

In region of Abruzzo there is a law that rules the percentage of biodiesel mixed in diesel for an average of 3%. Therefore we can assume that total consumption is 3% of 403.000 of tons: this is 12.090 tons¹

¹ Data is not official

5. DATA SOURCES

BURGOS (SPAIN)

- National Institute of Statistics (INE)
- Ministry of Industry, Commerce and Tourism
- Regional Government (Junta de Castilla y León)
- Biodiesel distributors (Via Operador Petrolífero, Grupo Sagredo, Huidobro de Gasóleos)
- Local Press Articles
- Websites:
 - www.diputaciondeburgos.es (Provincial Government)
 - www.itacyl.es (Regional Agriculture Institute)
 - www.mityc.es (Spanish Ministry of Industry)
 - www.bionor.es (Bionor Transformación, S.L.)
 - www.biocombustibles.es
 - www.biodieselspain.com

AVILA (SPAIN)

- Socioeconomic Study of the province of Avila
- Websites:
 - www.jcyl.es Castilla and Leon Statistic Yearbook
 - www.ine.es Statistic National Institute
 - www.asoc-aneli.es Free Petrol Station Association
 - www.dgt.es Traffic General Directorate
 - www.mityc.es Ministry of Industry

HUELVA (SPAIN)

- Newspaper:
Huelva Información (11/02/07)
- Instituto de Estadística de Andalucía:
<http://www.juntadeandalucia.es/institutodeestadistica/>

- Instituto nacional de Estadística: <http://www.ine.es/>
- Consejería de Innovación, Ciencia y Empresa:
<http://www.juntadeandalucia.es/innovacioncienciayempresa>
- Bionor: <http://www.bionor.es>
- Via Operador Petrolífera: <http://www.viaoil.es/>

POMURJE (SLOVENIA)

- Statistical yearbook of energetic economy of the Republic of Slovenia, Ministry of the Economy
- Press Articles: www.delo.si/article
<http://24ur.com>
www.energetika.net
- Si-stat, Census of Agriculture 2000
- Sugar Factory (plant), joint stock company
- Government Web site <http://www.gov.si/mop/dokumenti/etm%202005-3.doc>
- Statistical Office of the Republic of Slovenia
- Meteorological yearbook 2004
- Ministry of the Environment and Spatial Planning
- Local Energy Agency Pomurje
- Ministry of Agriculture, Forestry and Food
- Personal communication and surveys.

ABRUZZO (ITALY)

- Book printed by Regione Abruzzo: Le foreste in Abruzzo fra tecnica economia ambiente 2003, Regione Abruzzo
- Book printed by Regione Abruzzo: Lo sviluppo delle rinnovabili in Italia tra necessità e opportunità, 2005, ENEA
- Web site ISTAT, Statistical office www.istat.it
- Web site Regione Abruzzo, www.regione.abruzzo.it
- Web site ENEA, www.enea.it

- Web site Ministero dell'Ambiente, www.minambiente.it
- Web site Cetemps, Integration of remote sensing techniques and modeling for the forecast of severe weather www.cetemps.aquila.infn.it
- Web site ENI Oil Company www.eni.it
- Web site www.assocostieri.it
- Web site www.unionepetrolifera.it
- Web site www.sviluppoeconomico.gov.it
- Web site biodiesel producer www.foxpetroli.it
- Web site Engineering University of L'Aquila www.univaq.it

6. CONCLUSIONS

Based on the collected data we can note that the five regions, involved in the analysis are quite different in demographic, geographic and climate characteristics. Since some data of the five regions, which would be significant for compilation, is not commonly available and we cannot present it comparatively, they are presented separately by regions.

The concerned regions are also quite differential by availability of arable agriculture area, suitable for growing energy crops and by arable agriculture area already under energy crops. The data however is not available for all the concerned regions.

In addition we found out that the concerned regions (apart from Abruzzo and Pomurje) do not have a biodiesel plant. But according to collected data and the analysis, biodiesel plants are already under construction or will be built also in Burgos, Avila and Huelva, and Pomurje will gain additional biodiesel plan in near future.

The number of registered vehicles is different in the respective regions, which consequently leads to different consumption of transport fuels as well as biodiesel. The following table presents quantity of diesel and biodiesel consumption in respective regions and the rate of biodiesel consumption in comparison to total diesel consumption.

	Total diesel consumption in litres	Biodiesel consumption in litres	Rate of biodiesel use
Burgos	501.994.118	1.601.653	0,32 %
Avila	152.832.052	315.385	0,21 %
Huelva	418.754.012	9.092.762	2,13 %
Pomurje	31.296.155	350.000	1,12 %
Abruzzo	442.857.143*	13.285.714	3,00 %

* The amount is related to diesel consumption by personal vehicles.

The rate of biodiesel consumption with regard to total diesel consumption is relatively low, that is less than 0,5 %, except for Huelva province, where biodiesel is represented with 2,13 % and Abruzzo region, where biodiesel is rate was calculated in comparison to diesel consumption by cars.

These differences are due to the following facts:

- The normative in Italy forces diesel producers to mix their products with a 3% of biodiesel and that's why Abruzzo's rate is apparently the highest one. This high rate is not directly related to a high number of petrol stations (actually there isn't anyone) or the public awareness about biofuels. In any case, their rate will be 3% until Italian normative changes in this sense.
- The high rate found in province of Huelva (Spain), 2,13 %, could be caused by the current intensive agriculture in Huelva, which involves an increase in transport fuels consumption that, together with the increasing awareness of the citizens (Andalucía is the Spanish region with the highest biodiesel consumption levels and the highest number of "bio-petrol stations"), means a higher rate of biodiesel consumption than in other provinces of Spain. Moreover, there are two new biodiesel production plants under construction and these companies try to make an intensive promotion of biodiesel consumption among the citizens.
- In the cases of Pomurje, Burgos and Avila, the rates are lower, in line with the current low national rates in Mediterranean countries.