Visegrad Fund

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SUSTAINABLE PRODUCTION PROSPECTS VISEGRAD IN REGION

Hungarian report

project fanpage **project website :** www.k48.p.lodz.pl/ecomarket

The report was prepared in the framework of the project "Prospects of the Visegrad cooperation in promoting a sustainable consumption and production model" The project is supported by the International Visegrad Fund http://visegradfund.org/

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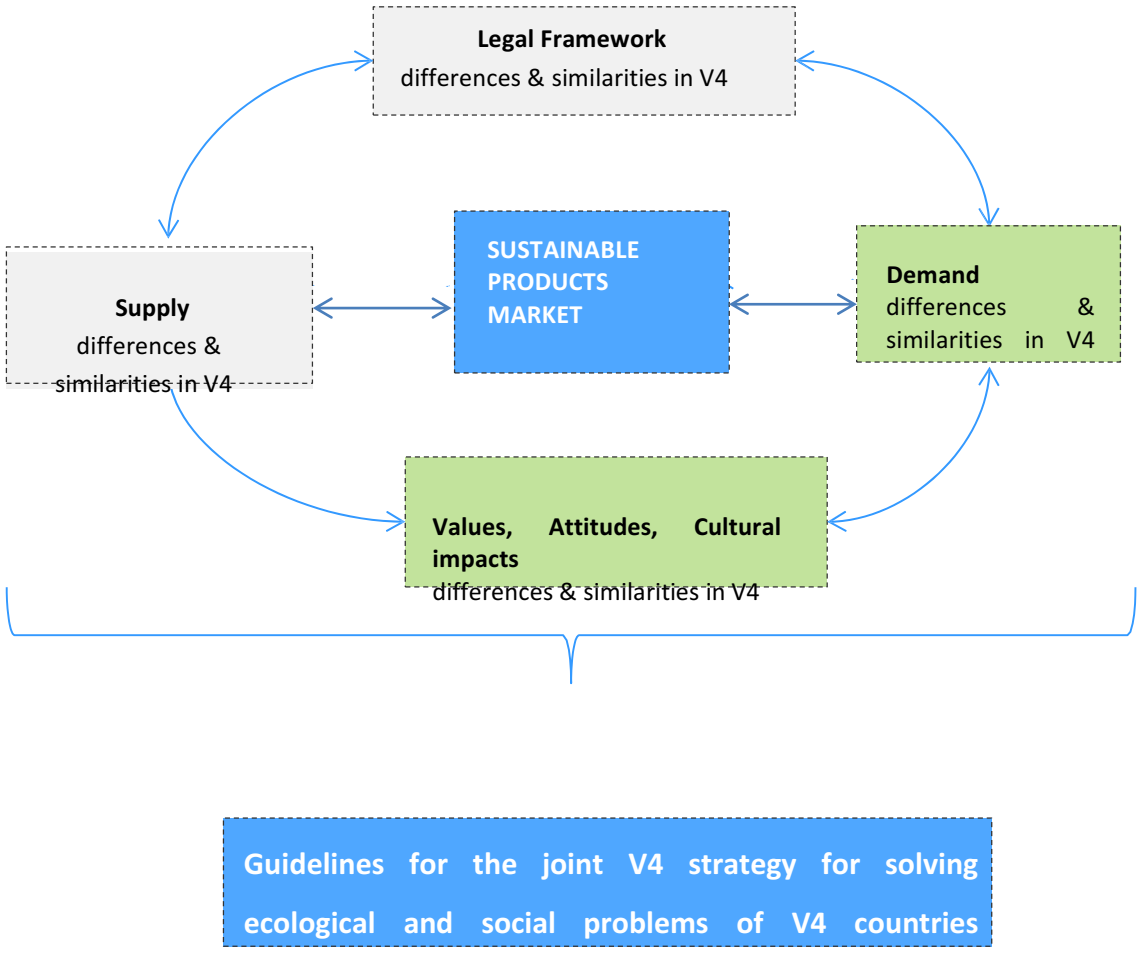
The Approach

The objective of this project is to support and strengthen the cohesion of the V4 countries in the efforts to achieve a more sustainable consumption culture and thus more sustainable production models in the selected consumer goods' markets. In the project this will be done within the analysis of intermediate connections and influences of:

- Demand side of the market – consumers
- Values, attitudes and cultural impact
- **Supply side of the market – produces**
- Legal framework



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1. Information and aims of the research

The first report concentrated on the demand side of the market represented by consumers, and their values and attitudes. It was important to analyse the demand side of the market, since the gradual environment degradation, shrinking of non-renewable resources and lower quality of life are directly or indirectly arising from snowballing consumption. But this is not enough, because demand related to the supply, so a research on the supply side of the market was required.

The main goal of this report is to show how sustainability is present in the Hungarian industrial production. There are a few questions we are going to answer:

- What do enterprises do?
- To what extent?
- What are the barriers and challenges?

In this report there are information about sustainable production in Hungary based on a desk research. We have examined the available Hungarian reports and statistics in this area.

The main part of this report is focused on sustainability in the Hungarian industry. To choose the tested areas, we have examined the GDP dispersion of Hungary. The most significant parts are agriculture, manufacturing, building industry and energy production. Waste management is strongly connected to industrial and household activities, so we examined that area as well. At the final part of the report, a case study was presented about a research which was made by our department.

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2. Sustainable industry in Hungary

Sustainability of the industry highly depends on how much inclination the different companies, enterprises have for development and innovation. Figure 1 shows the share of innovative enterprises in the EU between 2010 and 2012. [1]

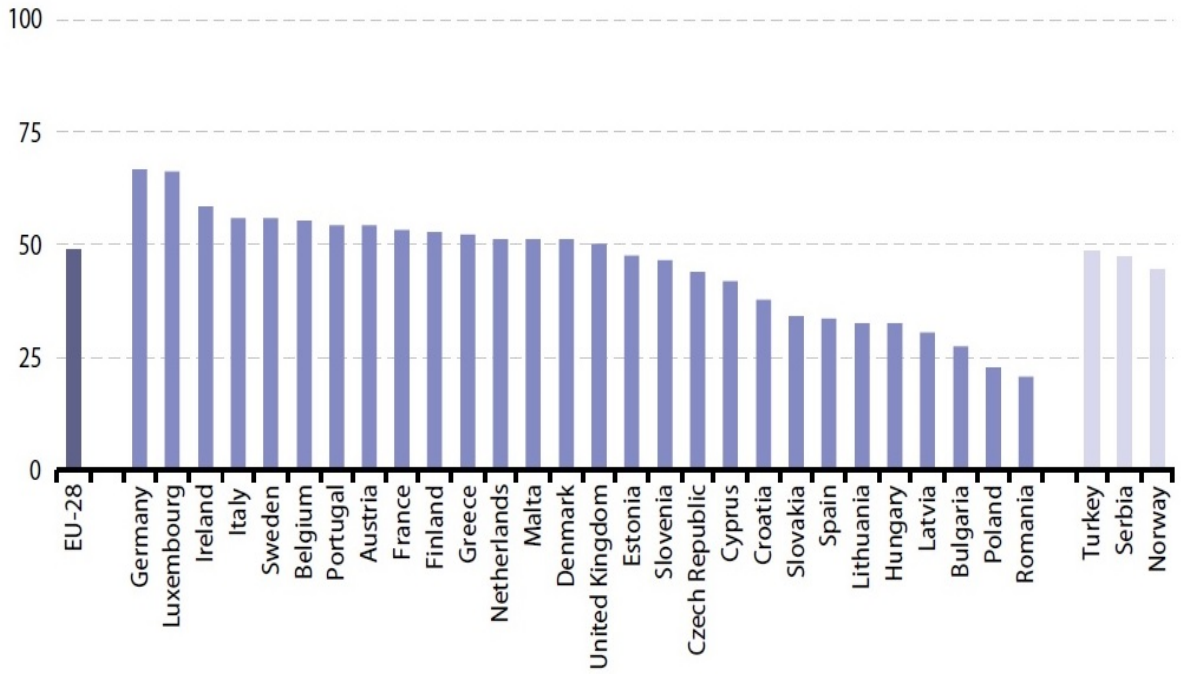

Figure 1.

In Hungary, this share was about 30%, which was below the EU average (about 50%) in that period.

2.1. GDP of Hungary, by sectors

GDP is a main indicator of the economical production of a country. The exact definition is: *„Gross domestic product (GDP) is a monetary measure of the value of all final goods and services produced in a period (quarterly or yearly).”* [2] On Figure 2 GDP dispersion between different sectors is shown. [3]

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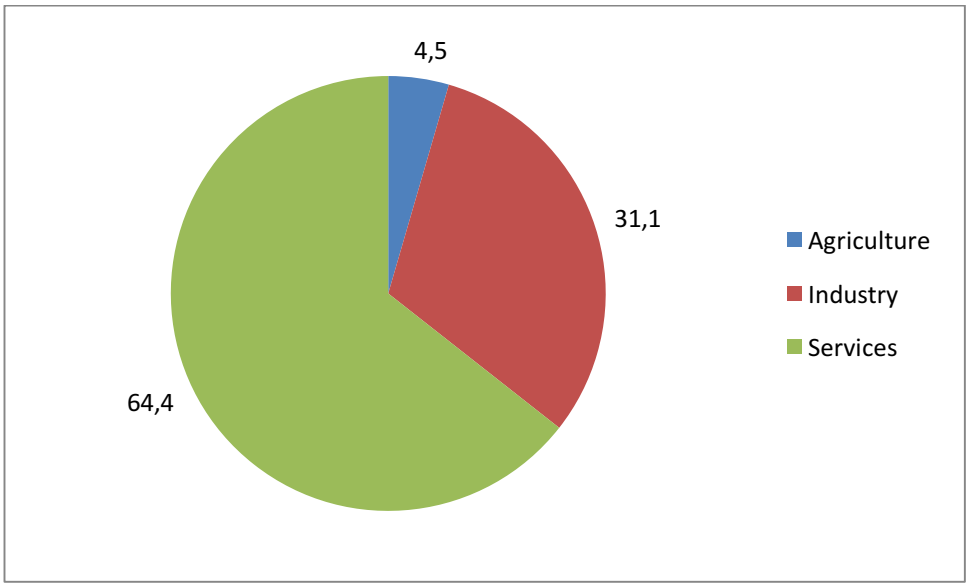

Figure 2.

According to a 2013 data, the GDP in Hungary was 13465 $/person. The most significant sector was services, which had a 64.4% part of the total GDP. The industry had a 31.1% and the agriculture had a 4.5% part. [3] For this report, the services were not relevant, so we focused on industry and agriculture during our research.

GDP dispersion between different industries is shown in Figure 3. [3]

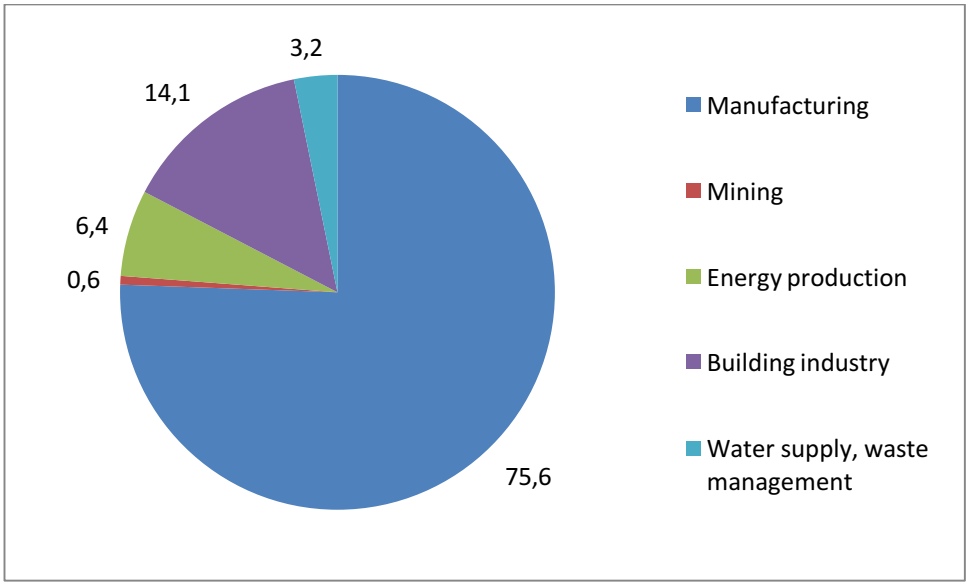

Figure 3.

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2.2. Manufacturing

According to available data, we can express that the key industrial sector in Hungary is the manufacturing industry. The main elements of the manufacturing industry in Hungary are: [4]

- food industry
- tobacco industry
- textile industry
- paper industry
- crude oil refinery
- chemical industry
- plastic industry
- car manufacturing

Despite its importance, there were no relevant data available on how sustainable is the manufacturing industry in Hungary, so the report focuses on the energy sector, waste management and agriculture.

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2.3. Energy production in Hungary

Nowadays electric energy and fuels are made mostly from fossil sources, the shares of different energy sources are shown on Figure 4. In 2013, 86.66% of primer energy sources were fossil resources. [5]

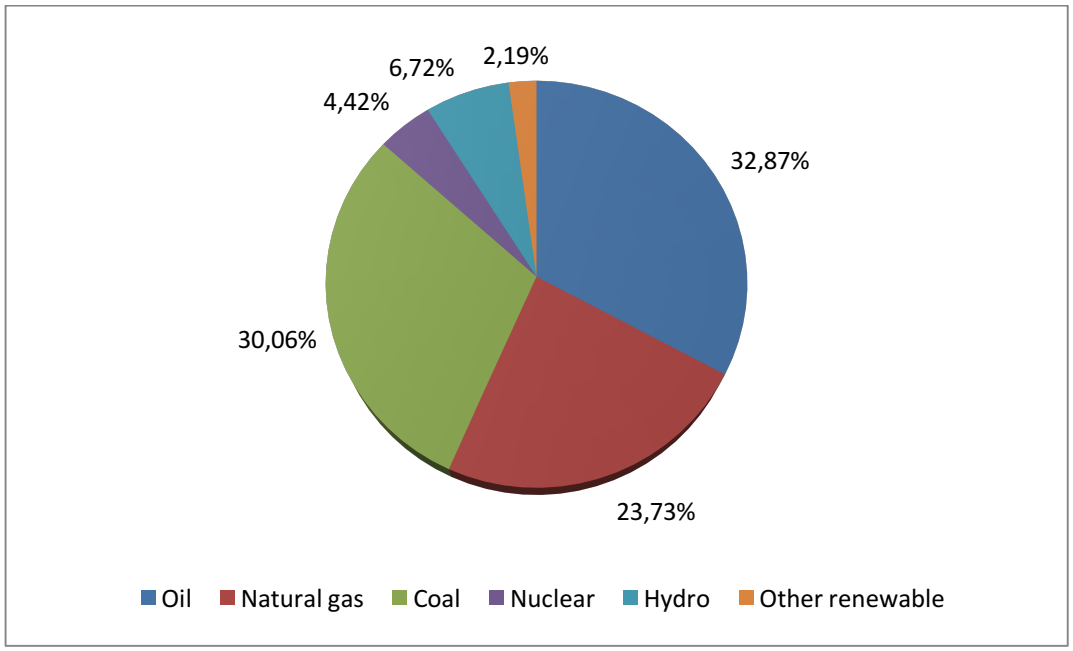

Figure 4

Since the conventional, cheaply exploitable fossil sources are running out within a few decades according to the forecasts, their usage is not sustainable. [6]

It is possible to use so-called renewable energy sources (wind, solar, geothermic). In 2013, renewable energy had a 8.91% part of the global primer energy mixture. Hydropower had nearly 7% share itself. Renewable energy has a big advantage against fossil-based energy: we do not have to wait millions of years for the re-creation of sources, since energy is gained from the Sun, wind, oceans, rivers and seas, and from the heat of Earth.

In 2014 the amount of the primer energy production in Hungary was 424.3 PJ. The amount of generated electricity was 29370 kWh, the dispersion of the energy mix is shown on Figure 5. [3]

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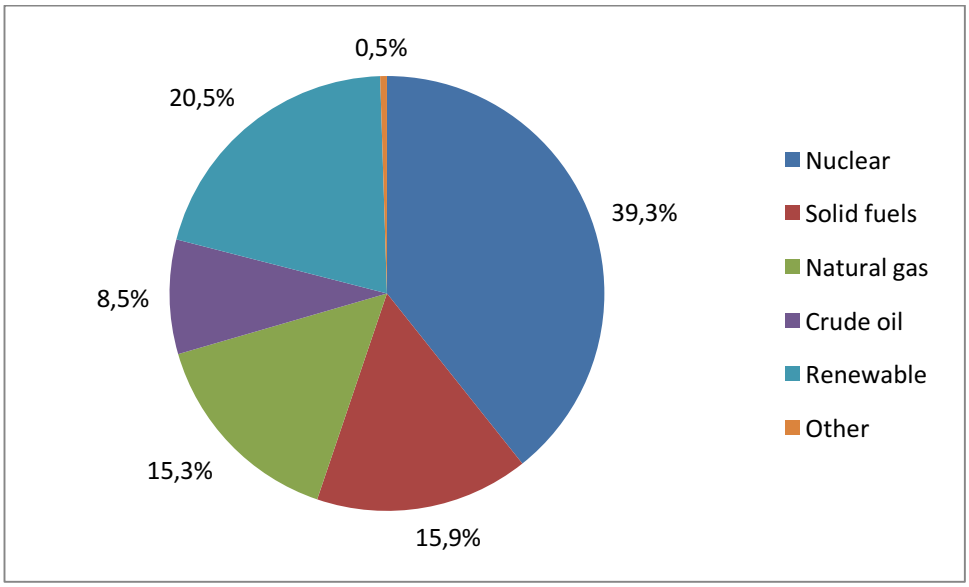

Figure 5

The most significant part of the energy mix is nuclear energy. In Hungary, there is one nuclear power plant in Paks, which has an overall power of 2000 MW. There are plans to build new blocks with additional 1300 MW power- [7]

As it is shown, only about 20% of the energy is from renewable sources in Hungary. The average is 24.3% for the EU-28, to which Hungary is close, but there are several countries where renewable energy has a larger cut in the energy mix. [1]

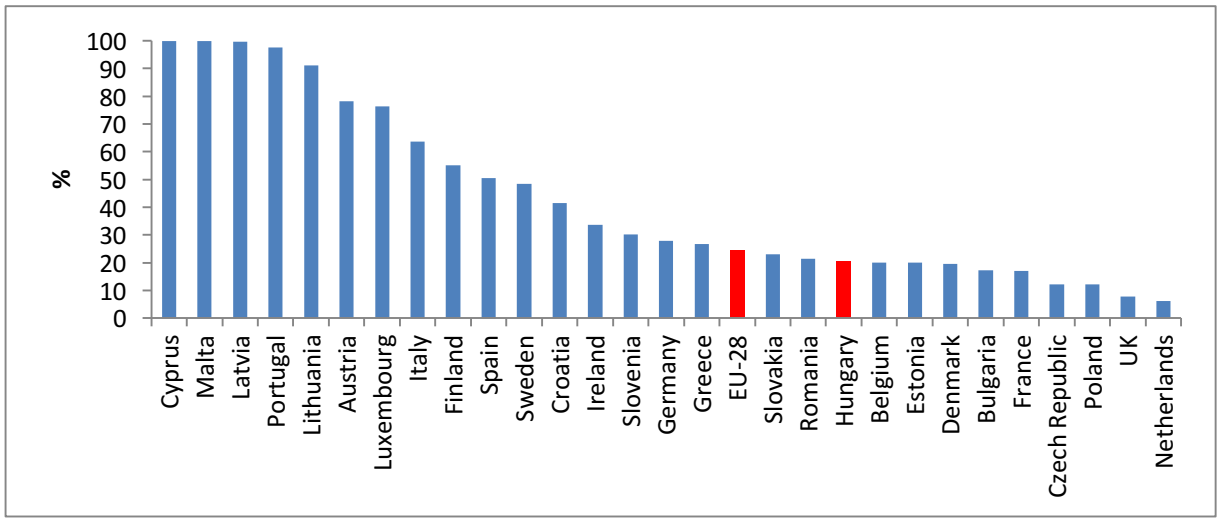

Figure 6.

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Figure 7. shows the dispersion of different renewable sources in Hungary. [3]

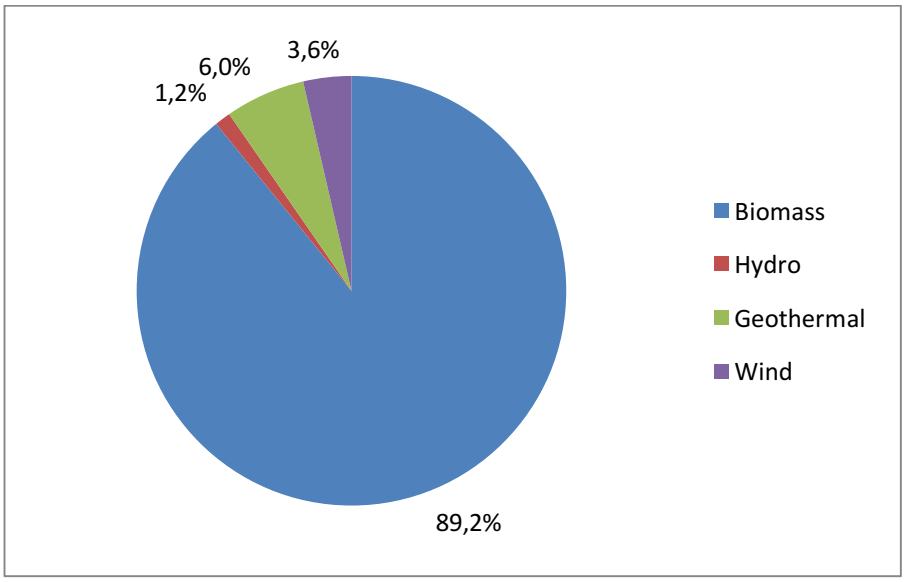

Figure 7.

Although using renewable sources is sustainable, there are a few limiting factors. First, except for the hydropower plant, the technologies got quite low efficiency. Secondly, in Hungray, the weather and geographical conditions are not suitable to use renewable sources in greater amounts. The number of sunshine hours and the intensity of winds are not too high, besides there are no high gradient rivers in Hungary. Due to these limitations, the energy production of Hungary is still strongly based on fossil and nuclear sources.

Combined heat and power (CHP) systems

In classic electricity and heat producing systems the power stations generates electricity, heat centres generate heated water or steam. In case of classic power stations, the forming heat is considered as heat loss, it is lead out through cooling towers. CHP systems leads the generated heat on turbines which generates electricity, and the remaining heat is used for heating through heat exchangers. The efficiency of general power stations can be increased from 30-40% to 75-80%.

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In Hungary, the share of CHP was around 20% until 2010, which was about twice higher than the average in the EU. However, this share reduced in the past few years, in 2012, only 14% of the energy production came from CHP systems, as shown in Figure 8. [3]

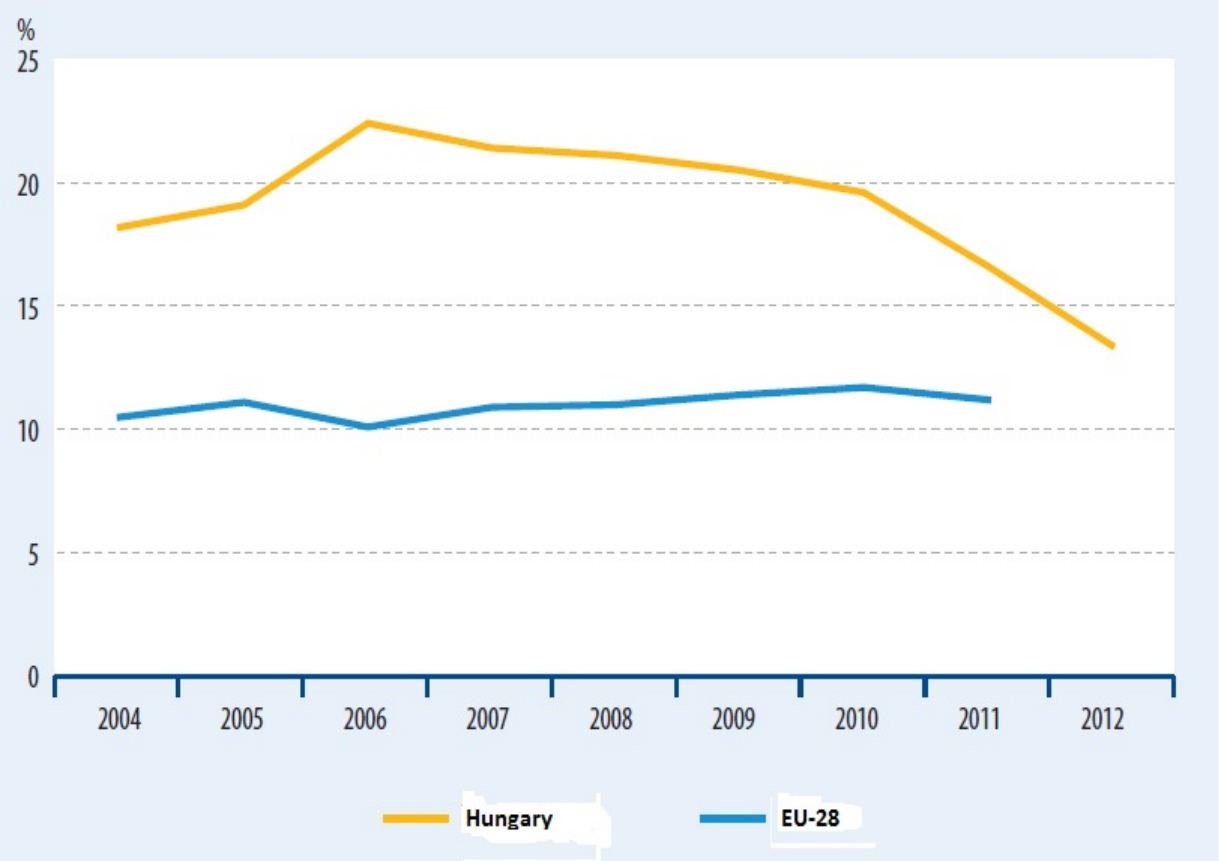

Figure 8.

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2.4. Waste management

Human and industrial activities are generating large amounts of wastes which must be treated. Waste management contains all activities and actions that are required to manage waste from its inception to its final disposal. During waste management, it is worth to follow a general hierarchy. The first aim is to prevent the genesis of waste, then the other aims are reuse, recycling and disposal.

Figure 9. shows how much waste is recycled in the countries of the EU-28. In Hungary, 4637000 tons of waste was recycled in 2012. The average in the EU was about 30000000 tons. [1]

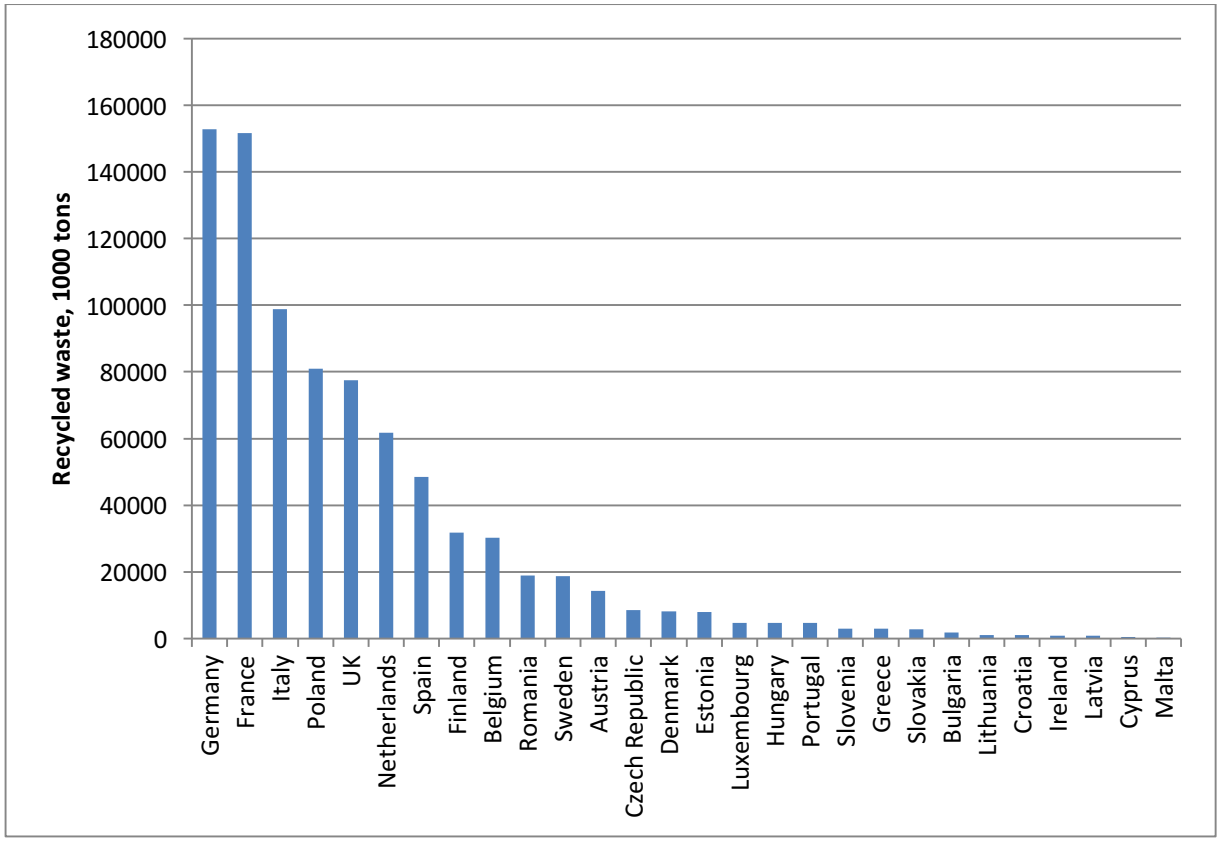

Figure 9.

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Figure 10. shows how much of the total waste was recycled in the EU-28 in 2012. Hungary recycled the 35.8% of its total waste. The average in the EU is 37.3%, so we were not far from the EU average in the examined year. [1]

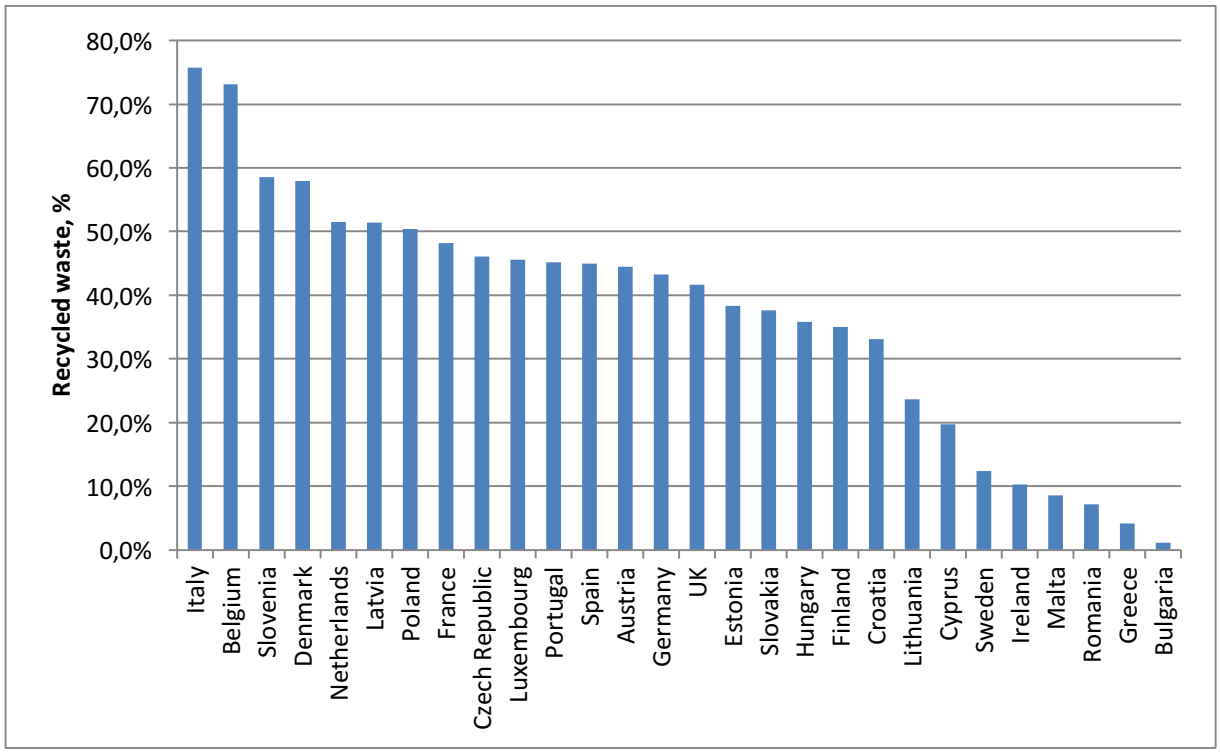

Figure 10.

One of the best ways of the waste management recycling the garbage in material. Figure 11 shows how much of the total waste was recycled in material in Hungary. [3]

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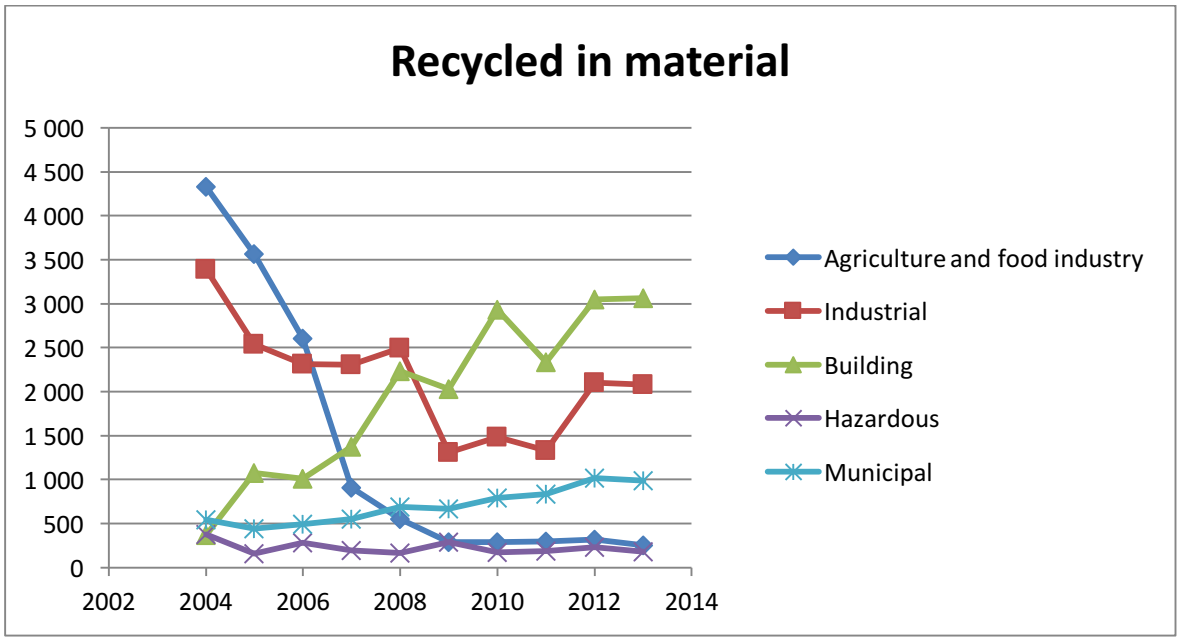

Figure 11.

The amount of agricultural and food wastes that have been recycled in material had a drastic decrease from 2004. It is shown that the total amount of that waste type had decreased as well. However, the amount of recycled building waste had increased in the examined time interval.

Not only the industries, but the households generate a great amount of wastes as well. On Figure 12 it is shown how much garbage had traditionally and selectively been collected. During the examined period, the total amount of selectively and traditionally collected wastes had decreased. Besides, the amount of selectively collected wastes had a slow increase. [3]

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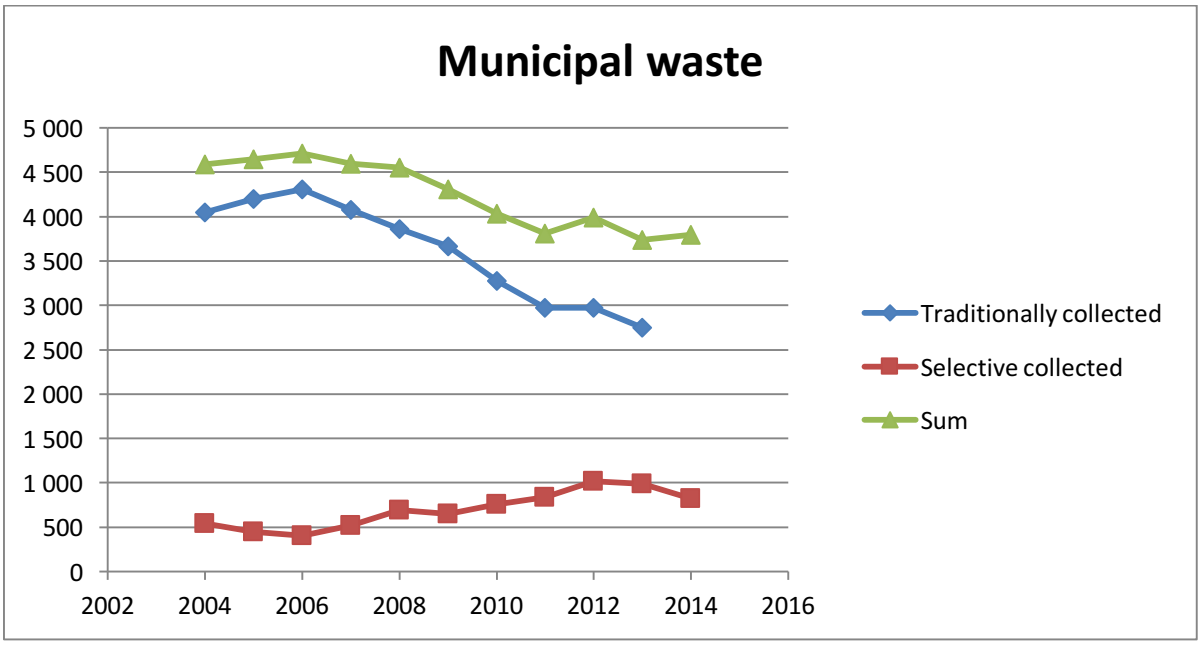

Figure 12.

Packaging waste

Packaging has an essential role both in the industry and the households. Packaging materials are usually paper and plastic, which can be recycled and reused. Figure 13 and Figure 14 shows how much packaging waste is recovered and recycled in the European Union. [1]

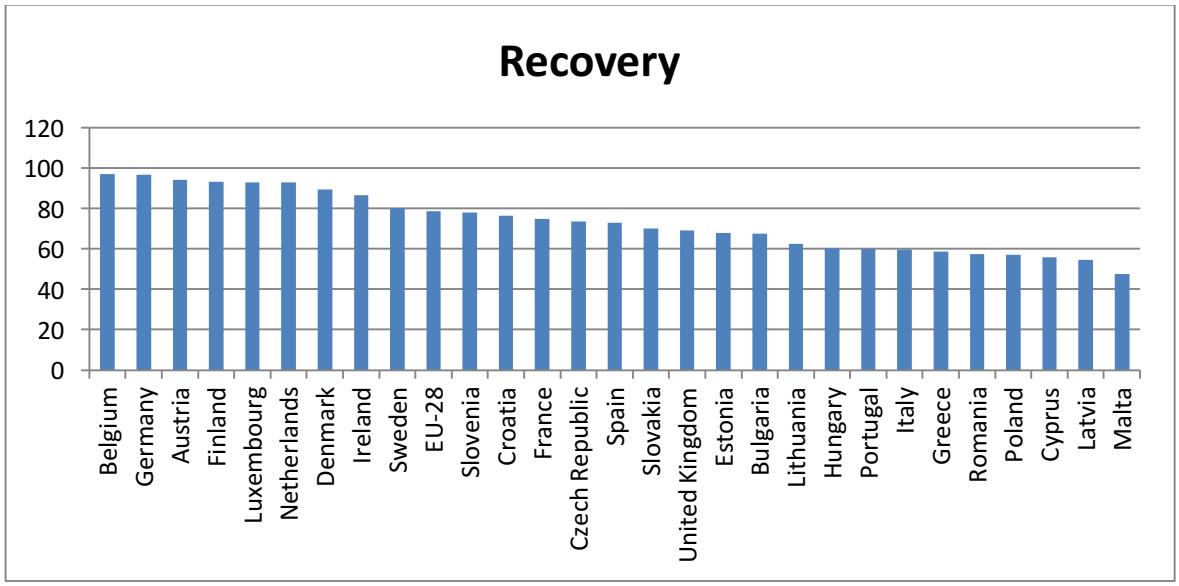

Figure 13

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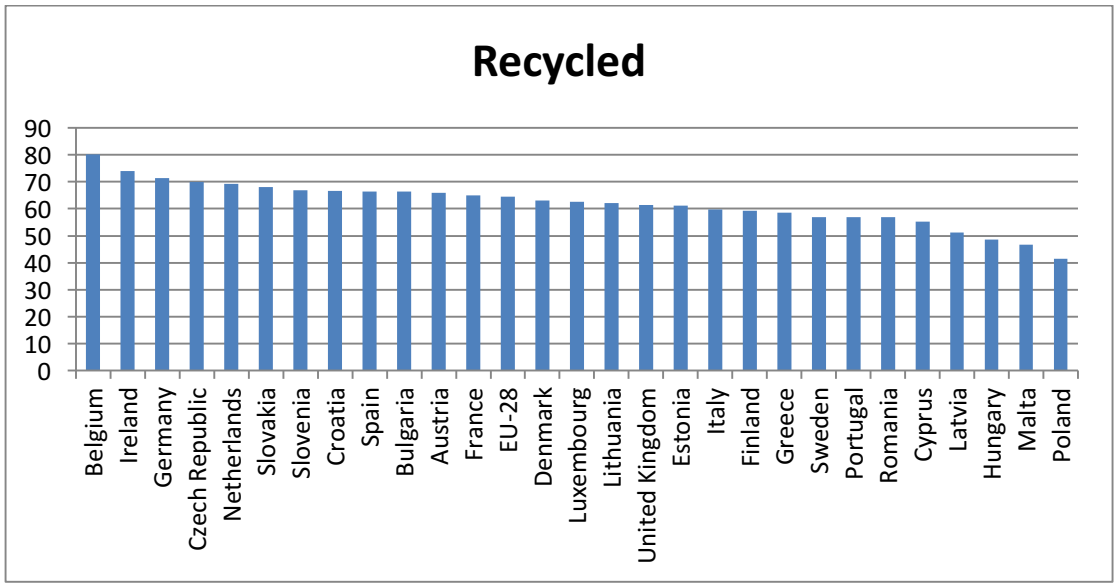

Figure 14

According to the available data, Hungary is below the EU-28 average in both categories. The recovery rate of the packaging waste in the EU was 78.5%, in Hungary it was 60.1% in 2012. The recycling rate of the packaging waste in the EU was 64.6%, in Hungary it was 48.5% in 2012.

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2.5. Organic agriculture

Organic agriculture is a type of agriculture which is based on organic manuring, biological plant protection and natural biological cycles, with only a mild use of synthetic fertilizers and synthetic plant protector compounds. Parts of the organic agriculture are: forestry, agriculture, landscape management, rural development and food production.

On the next figure the area of the organic agricultural lands in the EU is shown by countries. In Hungary, 140292 hectares of agricultural land was organic in 2013. [8]

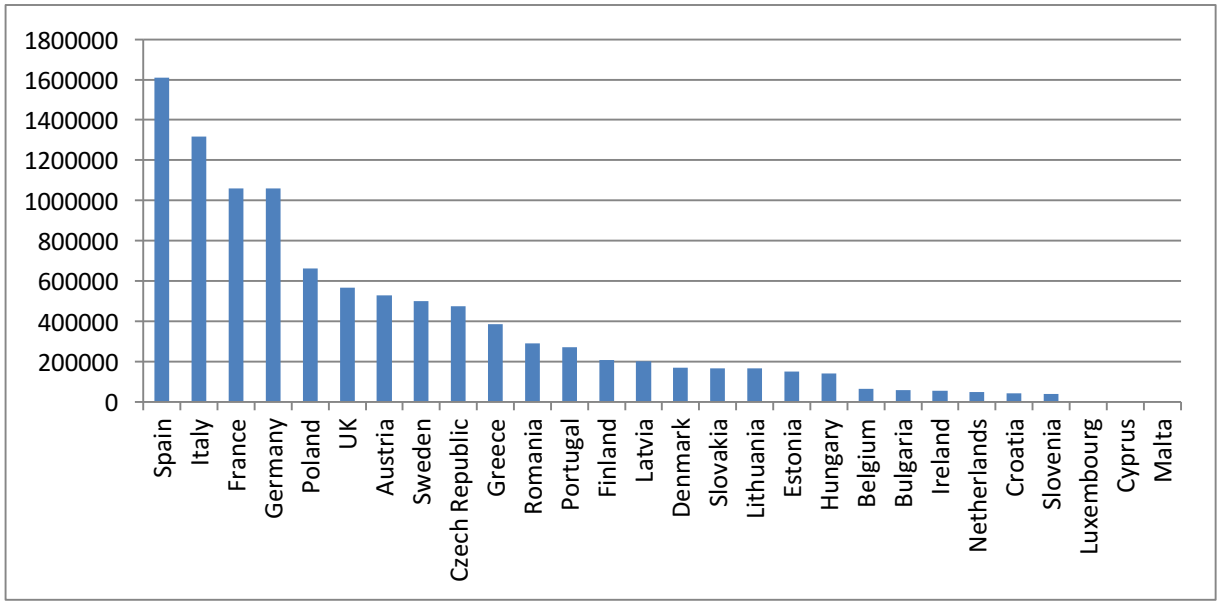

Figure 15

Figure 16 shows the rate of the organic agricultural land of the total agricultural lands. In Hungary, it was 3.3%, which is below the EU average (5.7%) in 2013. [8]

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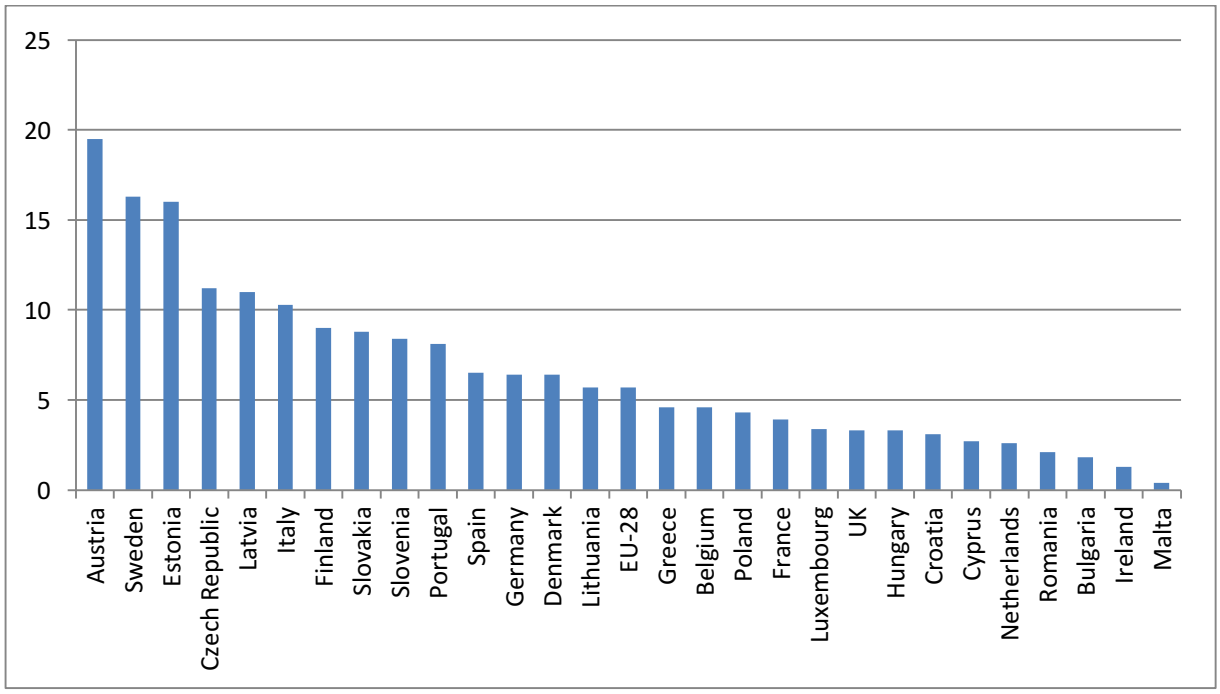

Figure 16

Although there are not many organic agricultural lands in Hungary, our country is within the ten countries which gained the largest amount of organic agricultural area increase in 2013. [8]

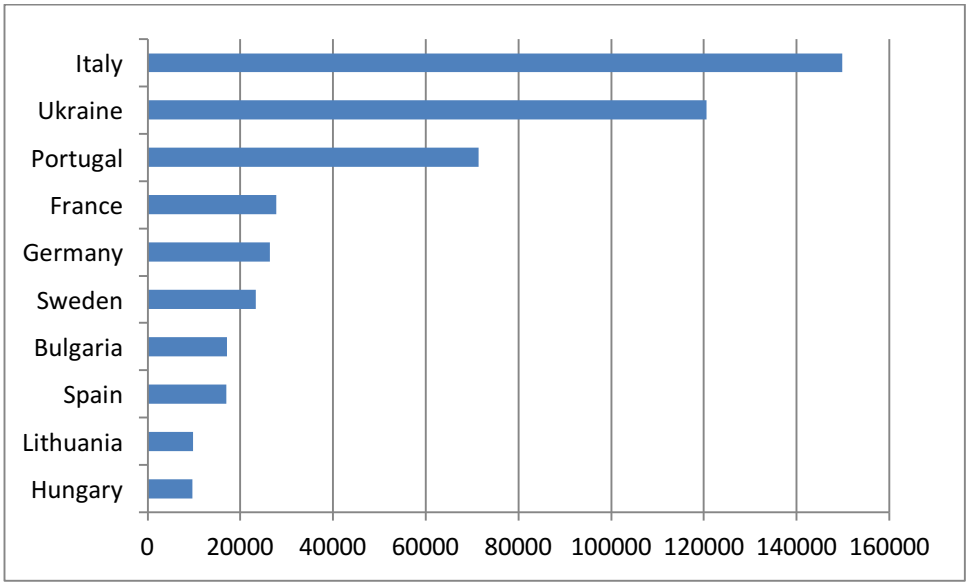

Figure 17

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3. Car tyre recycling – case study based on a department research [9]

As mentioned before, one way of the sustainable production is to recycle waste we produce and make recyclable goods. Our department had taken part in a research related to the recyclability of car tires. About 1.4 million tons of car tyre are produced every year for different types of vehicles, and similar amounts become waste. In Hungary, we produce about 65-70 tons of waste tyre every year. It is important to investigate the possible use of waste tyres for energy production, or even better, reuse in material.

To reuse tyre in material, it must be cut into smaller pieces and then grinded. This can be used for asphalt aggregate, for sport surfaces or, for example, sound isolation.

Our researches were based on a new concept: swelling the rubber polymer matrix with solvents and then separate steel drape from the rubber. Our department performed laboratory experiments in this area.

The main conclusions were:

- the solvents swelled the grinded rubber (diffused into it)
- depending on the temperature, they dissociated the S-H and S-S bounds in the rubber elastomer.

Although the reuse waste tyres in material is not solved yet, these facts mean swell the rubber can affect the properties of rubber in a good way, so grinding and separating the metal from rubber can be achieved easier, in addition, it is also good to use the grinded rubber as an aggregate.

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4. Summary

The main goal of this report was to show how sustainability is present in Hungarian industrial production. We examined the following sectors:

- Manufacturing
- Energy production
- Waste management
- Organic agriculture

Although manufacturing is the most significant industry in Hungary, there were no relevant data available on its sustainability.

Hungarian energy production is based on nuclear and fossil sources. Renewable sources have a 20% share of the energy mix. The most significant renewable source in Hungary is biomass. According to data, Hungary is close to the EU average of using renewable sources for energy production. As for the CHP energy production, Hungary is above the EU average.

As for waste recycling, the amount of selectively collected waste in Hungary had a small increase in the past few years. Despite this, waste recycling in Hungary is not as significant as in some other EU countries, therefore it would be necessary to develop this area.

Organic agriculture also plays an important part in sustainability. In Hungary, this kind of agriculture has not got a significant role. However, our country was within the ten country which gained the largest amount of organic agricultural area increase in 2013, which is reassuring for the future.

To summarize, Hungary is close to the EU averages within the examined areas, but there are several areas where further developments could be made to make the industry more sustainable.

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5. References

[1]: Eurostat Statistical Books – Key figures on Europe, 2015 edition

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[3]: https://ksh.hu

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[5]: http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy.html

[6]: http://www.petrostrategies.org/Learning_Center/are_we_running_out_of_oil_and_gas.htm

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About the Fund

The International Visegrad Fund is an international organization based in Bratislava founded by the governments of the Visegrad Group (V4) countries—the Czech Republic, Hungary, the Republic of Poland, and the Slovak Republic—in Štiřín, Czech Republic, on June 9, 2000 http://visegradfund.org/

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