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USAID EMPOWER PRIVATE SECTOR ACTIVITY – IN PARTNERSHIP WITH SIDA

ASSESSMENT OF PRIVATE SECTOR ENERGY CLUSTERS

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Executive Summary

This report assesses the green business sector in Kosovo, specifically the production trends vis-à-vis the imports of the following sectors: (1) wood biomass sector (stoves/boilers, pellet and briquette), (2) energy efficiency (Styrofoam, fiberglass mesh, display cabinets, cooling chambers, ovens and lacquer and facades), (3) recycling (motor oil, glass mosaic tiles, and granules), and (4) renewable energy (PV solar panels).

This analysis is conducted via two types of data. First, import data pertaining to the sectors of interest and stretching over 2014-2016/2017 has been obtained from Kosovo Customs. Secondly, a firm-level survey has been conducted with 43 companies across Kosovo. This is dependent upon a set of assumptions that were based on market trend, the business' production capacity, and its comparison with other businesses that were identified as part of the same sector but did not want to partake in the study. Due to a lack of data, in a series of subsectors the production is calculated both from actual data provided by companies and estimated values (where needed).

The results of the study are quite encouraging for some of the subsectors. Biomass has shown significant opportunities to replace imports, with increased domestic production and job creation. The overall market value of wood biomass cluster (stoves/boilers, briquette, and pellet) for 2017 was €30 million, of which €18.5 million amounted in import value, and €11.2 million produced domestically. Of this cluster, pellet exhibited the highest jump in production, from €2.46 million in 2014 to €18.76 million in 2017.

As regards the total market value of the energy efficiency clusters (paints, lacquers, and facades, fiberglass mesh and Styrofoam), this report indicates that in 2016 it was €61.8 million, of which €40.8 million amounted import value, and the remaining €21 million were produced domestically. Additionally, the report shows that a total of more than 20,100 PV solar panels have been produced locally in 2016 and 2017. In 2017, the local production of PV solar panels increased substantially, by 923%, amounting to €2.16 million (72% of the total market), the monetary value of PV solar panels produced.

The analysis of data suggests that Kosovars' demand for PV solar panels has increased. As regards the subsectors, the total market for glass mosaic tiles steadily increased from 2014 to 2016

accounting to an overall value of €442 thousands in 2016, 63.4% of which was domestically produced. In addition, granules and regranules produced from the recycling process of plastic had a total market of €21.30 million in 2016 (of which 11.5% was domestically produced), compared to 2014's value of €17.05 million, of which only 10% was domestically produced.

All in all, the study indicated that the surveyed companies seem to be quite capable of expanding their production capacities, after overcoming some major challenges that they face, including but not limited to predictability of energy supply, lack of skilled employees, and restrictions in the availability of raw materials. The findings of this report in general remain encouraging, especially considering that the overall domestic production quantities and values have increased throughout the timeframe analyzed.

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Acronyms and Abbreviations

ATP	EU Autonomous Trade Preference
CEFTA	Central European Free Trade Agreement
EFTA	European Free Trade Agreement
EMPOWER	USAID EMPOWER Private Sector
EU	European Union
HORECA	Hotels/Restaurants/Cafés

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1. Introduction

This study aims to assess the domestic production of Kosovo's green business sector consisting of the following energy sectors that USAID EMPOWER Private Sector project focuses on: wood biomass, energy efficiency, renewable energy and recycling. More precisely the objective is to analyze the trends of local production of these subsectors relative to imports. The USAID EMPOWER project seeks to boost job creation in Kosovo by supporting domestic businesses operating in the wood biomass sector (stoves/boilers, pellet and briquette), energy efficiency (Styrofoam, fiberglass mesh, display cabinets, cooling chambers, ovens and lacquer and facades), recycling (motor oil, glass mosaic tiles, and granules), and renewable energy (PV solar panels).

This analysis, which is based on surveyed manufacturers' inputs, indicates that domestic production has increased for all the products considered. For the majority of products, domestic production has increased more than imports. Some of the changes worth noting are the increase in the local production of pellet from 2014 to 2017 (approximately 330 percent in terms of tons and 455 percent in terms of value) and the takeover of the market by Kosovo's sole PV solar panel producer. The company started manufacturing in 2016, and within a year, the monetary value of production increased by 923 percent. The solar panels manufacturer in 2017 produced 2.58 times more than the total of what was imported Kosovo-wide.

The opening of the first glass recycling factory in 2016 has shown an immediate positive effect in the recycling system. This year, imports, as compared to 2015, dropped by around 56 percent, while the local production amounted to €280 thousand, representing a value higher than imports. Several of the companies responsible for the manufacturing of these products have received support from the USAID EMPOWER project. Depicted in Table 1 is a summary of values of local production and imports (cumulative).

Table 1. The value of production, estimated production, and imports (expressed in cumulative terms over the specified period)¹

	Units Produced Locally	Production expressed in €	Estimated Production expressed in €	Imports
Stoves/Boilers (2015-2017)	8,900 pieces	N/A	€11,334,671	€ 18,000,419
Briquettes (2014-2016)	1,670 tons	€267,200	N/A	€224,905
Pellets (2014-2017)	65,073 tons	€12,941,358	N/A	€22,065,807
Fiberglass Mesh (2015 – 2017)	N/A	€2,056,594	N/A	€8,533,864
Paints, Lacquer and Facades (2015 – 2017)	N/A	N/A	€ 27,545,317	€107,571,186
Display cabinets (2014 – 2016)	1,137 pieces	€1,031,000	N/A	N/A
Cooling Chambers (2014 – 2017)	N/A	€2,784,000	N/A	N/A
Ovens (2014 – 2016)	459 pieces	€272,500	€372,163	€285,075
Styrofoam (2014 – 2016)	753,575 m ³	€30,143,000	N/A	€4,197,744
PV Solar Panels (2014-2017)	20,193 panels	€2,375,430	N/A	€2,191,650
Glass Mosaic (2014-2016)	N/A	€280,418	N/A	€839,951
Granules & Regranules (2014 - 2016)	N/A	N/A	€ 6,518,084	€50,502,000

Source: Authors own calculations and Kosovo Customs data.

2. Background

Overall imports of goods in Kosovo increased by 9.2 percent in 2017 compared to 2016, reaching an all-time high of €3.05 billion. The import breakdown of some of Kosovo's major trading partners are: Serbia 16.1 percent, Germany 10.4 percent, and China 6.6 percent. In the meantime, exports in 2017 jumped up by 22 percent from the previous year, reaching €378 million. During this year, exports to India rose by 458 percent and those to Albania by 43.2 percent.²

However, the continuous negative trade balance remains one of the country's most notable macroeconomic imbalance since 1999. The trade deficit constantly widened throughout the past ten years, reaching the highest level in 2017 at €2.67 billion³. Despite the fact that exports

¹ Production is calculated using actual data, while estimated production is calculated using actual data and a set of assumptions that are explained in the methodology section.

² Trading Economics (2018), Kosovo Imports and Exports, Kosovo Customs Office.

³ UNDP (2015), Potential Export Markets for Food Processing, Agriculture, Wood Processing, Construction Materials, Tourism and Artisanal Crafts Sectors.

steadily increased from 2003 to 2017, the trade deficit gap has continued to widen because the growth rate of imports has generally increased faster than the growth rate of exports.

Kosovo's trading partners have been categorized into seven groups, in line with Kosovo Agency of Statistics' guidelines. Its main trading partners are generally the European Union (EU) countries and Central European Free Trade Agreement (CEFTA) member states. The category of EU countries in this analysis refers to 28 EU countries, including Austria, Great Britain, Germany, Greece, Netherlands, and Bulgaria. Meanwhile, the category of CEFTA countries includes neighboring countries like Albania, Macedonia, Montenegro, Serbia, and Bosnia and Herzegovina. As of today, Kosovo imports goods from over 120 countries in five different continents. Nonetheless, over seventy percent of the country's total imports come from the EU and CEFTA member countries, as shown in Figure 1. This figure also displays Kosovo's imports from European Free Trade Association (EFTA) countries, including Switzerland, Iceland, Norway, and Liechtenstein, which constitute the smallest share of Kosovo's imports. The North and South America category pertains to USA, Canada, Brazil, and Mexico, while the Asia category includes Japan, China, and India. The category of "other European countries" includes Turkey and Ukraine, with Turkey being yet another important trading partner of Kosovo when it comes to imports. On average, seven percent of the country's imports originate from Turkey annually. Imports from the United States (U.S.) and Switzerland remain low, with three percent of total imports originating from these countries over the last decade⁴.

⁴ Ibid.

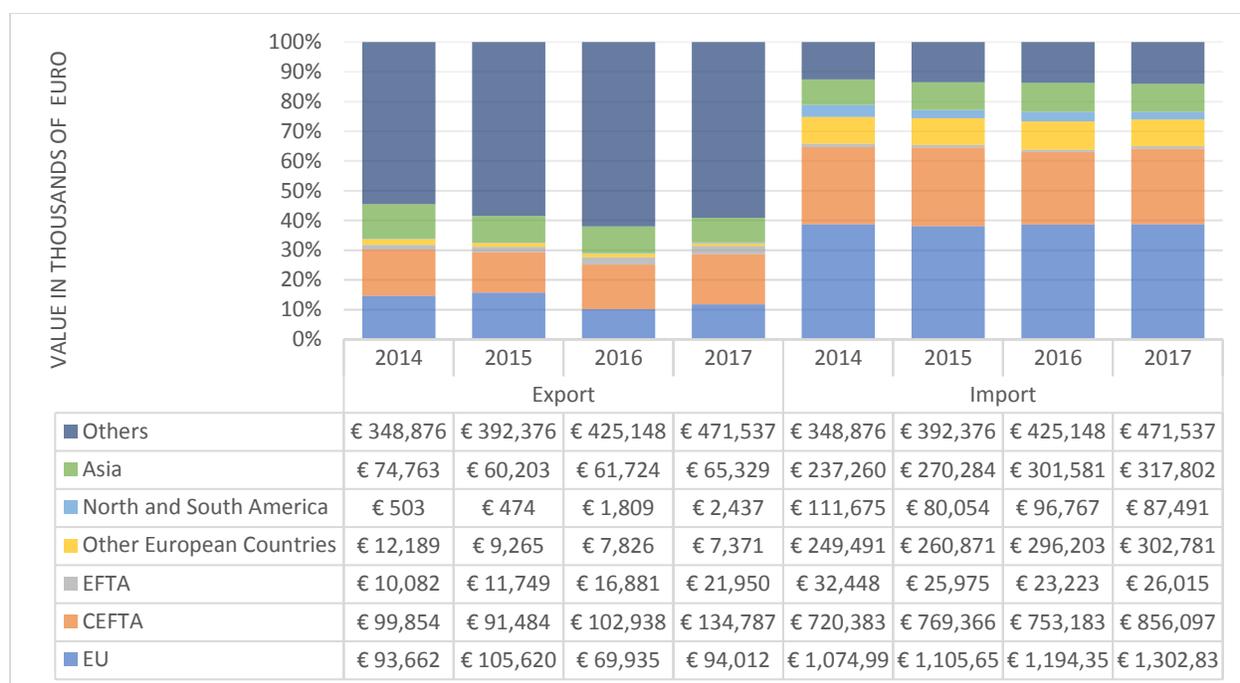


Figure 1. Kosovo's import and exports (in 000s)

Data source: Kosovo Agency of Statistics, 2017

Just as with imports, Kosovo's exports are also mainly directed towards the CEFTA and the EU countries, mostly because of trade agreements which are in place. As shown in Figure 1, 80 percent of the exported goods that are made in Kosovo, on average, find a market in CEFTA and EU member countries. Switzerland is currently the fifth largest market for products made in Kosovo – with exports amounting to €21.35 million. This may be partly attributed to the big concentration of Kosovo diaspora in this country, which accounts for twenty-five percent of the total Kosovo diaspora, or over 700 thousand people, specifically⁵. Kosovo products are being increasingly exported to Netherlands, and this trend reached its peak in 2017 with 3.3 percent of total exports, or a total value of €12.8 million.

Several trade-facilitating instruments have been established by the Kosovo's Customs Code, which is fully compliant with EU's and World Customs Organization's requirements. The customs system is largely based on the EU's modern model of a Customs Administration, where powers, taxes, guarantees, procedures, and offences that have some economic impact are set out by law,

⁵ UNDP (2014), Kosovo Human Development Report.

or, more specifically, the Customs Code. Whereas, day-to-day activities in this regard are implemented and enforced by the Customs Service.

Currently, Kosovo benefits from duty-free, nonreciprocal trade to the EU's market under the EU Autonomous Trade Preference (ATP). Under this particular agreement, qualitative and quantitative restrictions are applied to only a limited number of goods. Additionally, under CEFTA, Kosovo has a free-trade agreement with countries of Southeast Europe, an agreement which provides Kosovo exporters with duty-free access to over 520 million customers⁶. Furthermore, in terms of trade, Kosovo has received a positive note from the World Bank Doing Business Report 2018, as it has been ranked in the 48th place⁷.

Additionally, on a more energy-relevant note, some tax changes aimed at supporting local producers in Kosovo have been entered into force as of January 1, 2018. Based on two decisions⁸ approved in 2017 by the Kosovo government, the excise tax has been removed on imports of all energy sources and customs duties have been removed on raw material imports, information technology equipment and machines, and semi-manufactured products utilized in production activities. The tax changes are predicted to have a positive impact on the private sector, mainly by increasing the competitiveness of local producers in the region⁹.

3. Methodology

Two types of data were used for this analysis. Initially, raw data were obtained from the Kosovo Customs to derive the value of imports from 2014 to 2016/2017. The products of interest for this analysis were those pertaining to the following sectors: wood biomass (stoves/boilers, pellet and briquette), energy efficiency (Styrofoam, fiberglass mesh, display cabinets, cooling chambers, ovens and lacquer and facades), recycling (motor oil, glass mosaic tiles and granules), and renewable energy (solar panels).

⁶ UNDP (2015), Potential Export Markets for Food Processing, Agriculture, Wood Processing, Construction Materials, Tourism and Artisanal Crafts Sectors.

⁷ "Doing Business in Kosovo - World Bank Group."

⁸ The Government decision no. 13/07 and 14/07.

⁹ SeeNews (2018), Kosovo scraps levies on imports of energy products, raw materials from 2018.

A survey instrument (i.e. a firm-level questionnaire) was then designed and data was collected from companies throughout Kosovo on the manufacturing of the above-mentioned products. The participation in the survey was voluntary and the respondents' (company representatives) answers were held in strict confidence. Respondents did have the option of not responding to questions presented to them.

In order to estimate best as possible the real production values and quantities, a set of assumptions were made. Each of the assumptions was based on the market trend, the business's production capacity, and its comparison with other businesses that were identified as part of the same sector but did not want to partake in the study. For some of the products, because of the variance in prices at different companies, an average price was used to calculate the production value. Hence, actual production labelled solely as "production" is derived directly from the inputs obtained by the companies, while "estimated production" is extrapolated through either average pricing and/or production assumptions. The production assumptions were built through two metrics, namely the estimation of market presence and partial information that was obtained from the companies. Market presence has been estimated for certain companies by analyzing product placement and product dispersion at major points of sale in the visited municipalities. Throughout the report, some subsectors have both production that was calculated from actual data provided by companies and estimated production that was calculated based on assumptions as a consequence of lack of actual data from certain companies. This method was chosen with the sole aim of developing the closest possible proxy to the values related to real production.

It is important to note that the vast majority of the companies were identified a priori while the others were randomly picked. However, because in many cases the number of companies either interviewed or whose data were extrapolated per each subsector is believed to represent the overwhelming share of the domestic market, the author of the report can make a reasonable assumption that the actual and extrapolated data per each subsector are reasonably close proxies of domestic production in Kosovo. The aim of the study was to cover the vast majority of the domestic production, hence, while the production values and quantities presented below may not cover the domestic market in its entirety, it can be reasonably assumed that actual and extrapolated company data cover the vast majority of the domestic market.

The domestic production is a reflection of either actual data or assumptions built for the identified companies within the sector and/or subsector. As such, whenever there is a reference to domestic production in the report, especially in terms of sales figures, such figures should be understood to derive from the methodological logic explained above. The number of identified companies for each sector is depicted in Table 2.

Table 2: Identified manufacturers for each of the sectors included in this study

Sector	Identified Manufacturers
Wood Biomass	20
Energy Efficiency	17
Renewable Energy	10
Recycling	5
Total	43

4. Results

4.1. Wood Biomass

The wood biomass sector is divided into two main clusters of manufacturers and producers. The equipment manufacturers' cluster is comprised of companies that produce stoves/boilers and other similar appliances. The producers' cluster includes wood biomass (pellet and briquette) producing companies. The annual production value of these wood biomass clusters as defined above (stoves/boilers, briquette and pellet) in 2015 was €4.6 million, while in 2016 it increased by €2.62 million (57 percent) to €7.22 million. A similar trend occurred in 2017, where the annual production value amounted to €11.32 million¹⁰, an increase of more than €4.1 million compared to the year before. It is important to mention that these values were derived from 20 companies that participated in the study.

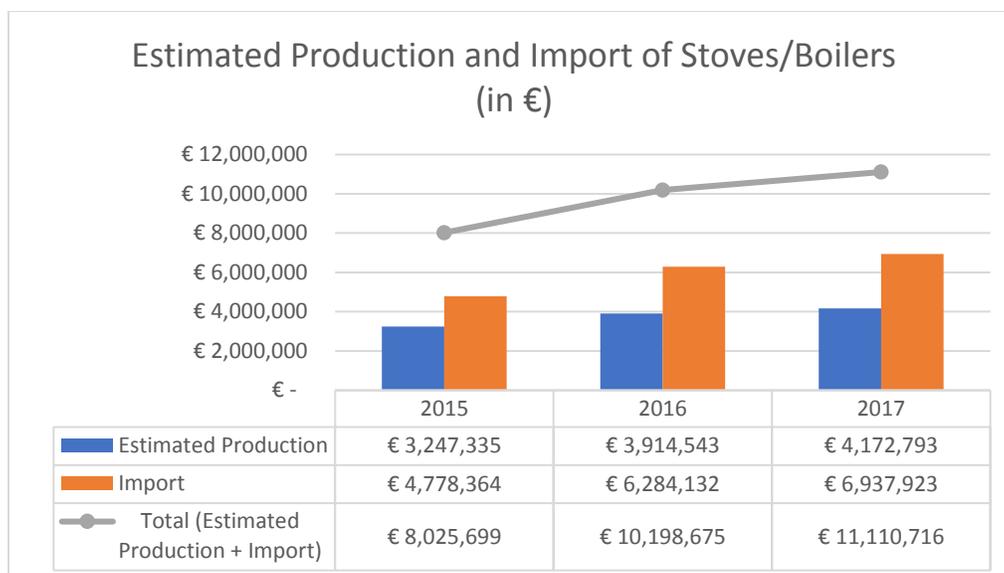
¹⁰ This value excludes briquette production value in 2017, the information for which was not obtained.

4.1.1. Stoves/Boilers

Stoves/boilers are key home-heating appliances which use up different types of energy sources. Some of the energy sources that can be used in stoves/boilers are briquette and pellet which are explored in depth later in this report – specifically, in subsections 4.1.2. and 4.1.3. of the wood biomass section. In Kosovo, there are a few companies that manufacture stoves/boilers. Two companies that cover the majority of the market have provided inputs, while a third company that was approached did not want to disclose any type of information.

The price of stoves/boilers from the information obtained from the market ranges from €250 to €12,000, depending on their size. Additionally, the information received from the manufacturers shows that the largest portion (60 – 70 percent) of stoves/boilers has been sold at a range of €250 to €800. The value of domestic production was estimated using this metric.

Stove/boiler characteristics vary based on producers. Residential stoves/boilers of the above-mentioned manufacturers have a capacity of 20 to 80 kW, while those designed for commercial use have a capacity of 1,000kW. As depicted in Figure 2, from the information obtained from the manufacturers which cover the vast majority of the market in Kosovo, in 2015, it is estimated that the value of locally produced stoves/boilers was around €3.25 million, while the value of imports was €4.78 million. In 2015, it is estimated around 2,560 stove/boiler units were produced locally. In 2016, an upward trend was noticed in both imports and local production. Domestically, production increased by 20 percent to 3,088 stoves/boilers, or expressed in monetary value to €3.91 million, whereas imports rose by €1.5 million amounting to €6.28 million. In the following year, in 2017, imports and domestic production followed a similar trend. In 2017, it is estimated that at least 3,292 stoves/boilers were produced domestically, at an estimated value of €4.17 million, and a total value of €6.94 million worth of stoves/boilers were imported. The Kosovo Customs does not provide information on the exact number of units that were imported. Nonetheless, it is estimated that over 8,000 stoves/boilers were imported from 2015 to 2017.

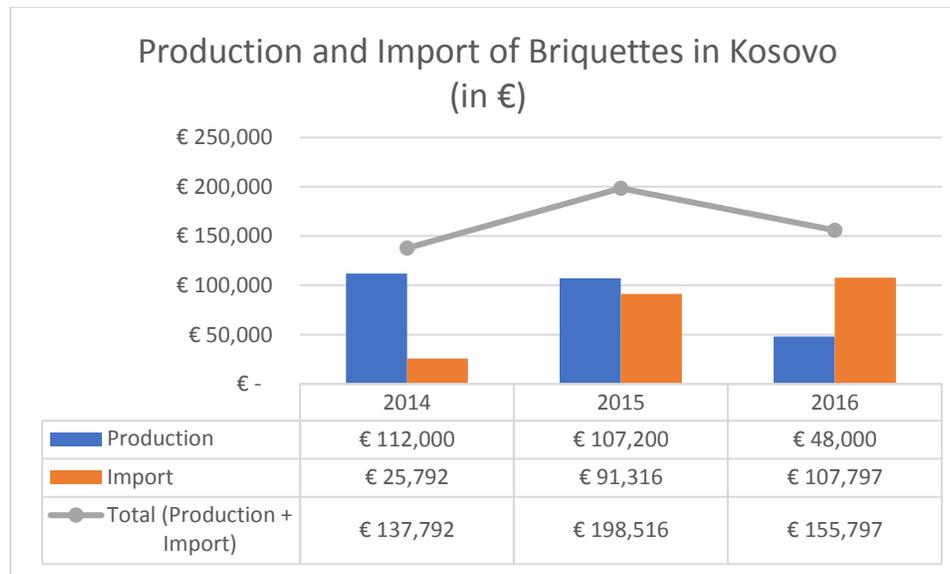


*Figure 2. The estimated value of produced and imported stoves/boilers in Kosovo¹¹
Source: Author's own calculations*

4.1.2. Briquettes

The production and import of briquette in Kosovo, based on the information extrapolated from four manufacturers and the data from Kosovo Customs, has undergone interesting developments throughout the period of 2014 to 2016. Figure 3 depicts the value of produced and imported briquette during this time frame. In 2014, the value of production was 434 percent higher than that of imports – €112 thousand worth of briquettes were produced domestically and around €26 thousand were imported. Nonetheless, the production dropped by €4.8 thousand (4.8 percent) in 2015, while imports rose significantly by €65 thousand, or 254 percent reaching €91 thousand. A substantial decline in domestic production was noticed in 2016, where the value of produced briquettes declined by 55.2 percent to €48 thousand. The decline in domestic production for at least one of the manufacturers is a result of the difficulty to collect raw, input materials. The other reason behind the fall in the production of briquette is the increased focus of consumers in pellet, which is considered to be a more viable option.

¹¹ The results reflect the production of three identified manufacturers.



*Figure 3. The value of produced and imported briquette in Kosovo¹²
Source: Author's own calculations*

4.1.3. Pellets

The ever-increasing demand for wood pellet in Kosovo over the past few years¹³ has resulted in a steady growth of domestic pellet production, as can be seen in Figure 5. The quantity of pellet produced domestically has almost tripled from 2014 to 2017, going up from 7,900 tons to 34,048 tons within this period. Despite the quantity produced, the average price of pellet in the market has also increased from €163 to €230 per ton. In 2017 the price per ton of pellet peaked to €230, nonetheless the average was around €210 per ton. The annual value of pellet production over the time period analyzed increased for more than €5.8 million. As shown in Figure 4, the value of pellet produced in Kosovo in 2014 was around €1.3 million, whereas its value in 2017 reached almost €7.15 million. In a similar fashion, the quantity of imported pellet also increased over the past few years. The value of imported pellet from 2014 to 2017 has gone up from almost €1.2 million to €11.6 million.

The total value of pellet (imports and domestic production) throughout this period ranged from €2.46 million in 2014 to €18.76 million in 2017, an increase of more than 660 percent. It is worth

¹² The data was obtained by 4 local manufacturers.

¹³ Empower (2016), Kosovo Takes Solids Steps Toward Production of Renewable Energy Sources

noting that in 2016 and 2017, the domestic production in terms of monetary value covered around 37 percent of the total market (production and import).

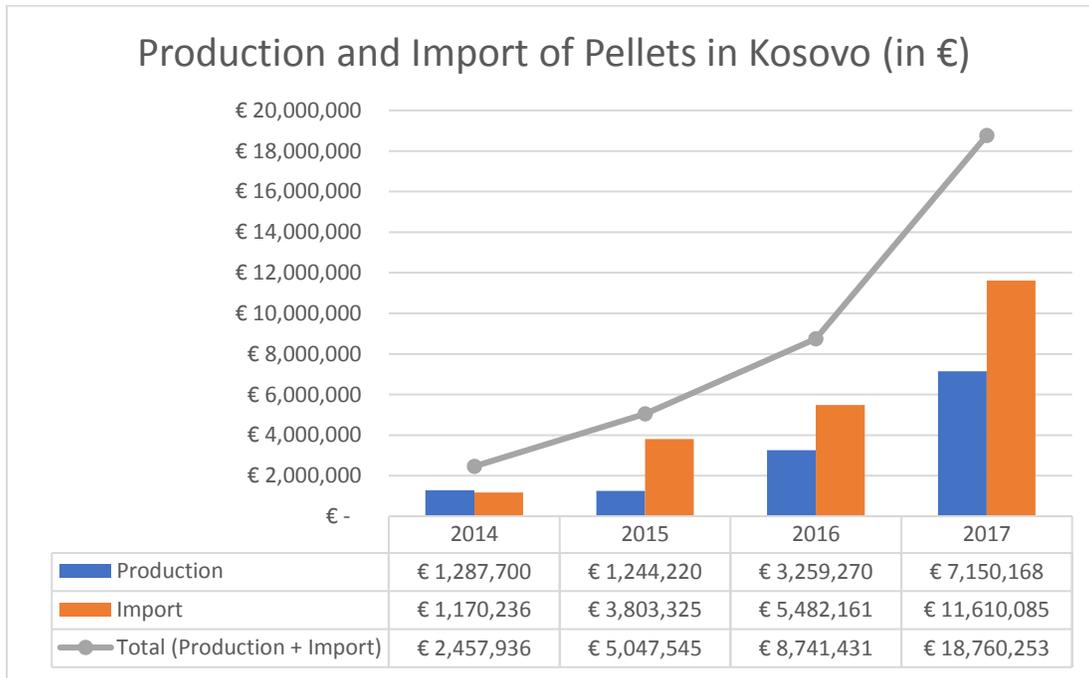


Figure 4. The value of produced and imported pellets in Kosovo¹⁴
Source: Author's own calculations

As shown in Figure 5, local pellet production (in tons) has more than quadrupled over the last three years. In 2014, 7,900 tons of pellet were produced locally, and in 2017, that value went up by 330 percent to 34,048 tons. Similarly, the number of tons of pellet imported also went up from 6,872 tons in 2014 to 80,714 tons in 2017, indicating an increase in demand for pellet in the local market which could not be satisfied by domestic production alone. The increased demand for pellet as the market has indicated is derived from the products usage feasibility and its better stance as compared to its competitors. The domestic manufacturers in this regard stated that they are facing problems in the collection of the raw material needed for the production of pellets. Therefore, their production capacities are limited.

¹⁴ The value of production was calculated using the information provided by 13 local manufacturers.

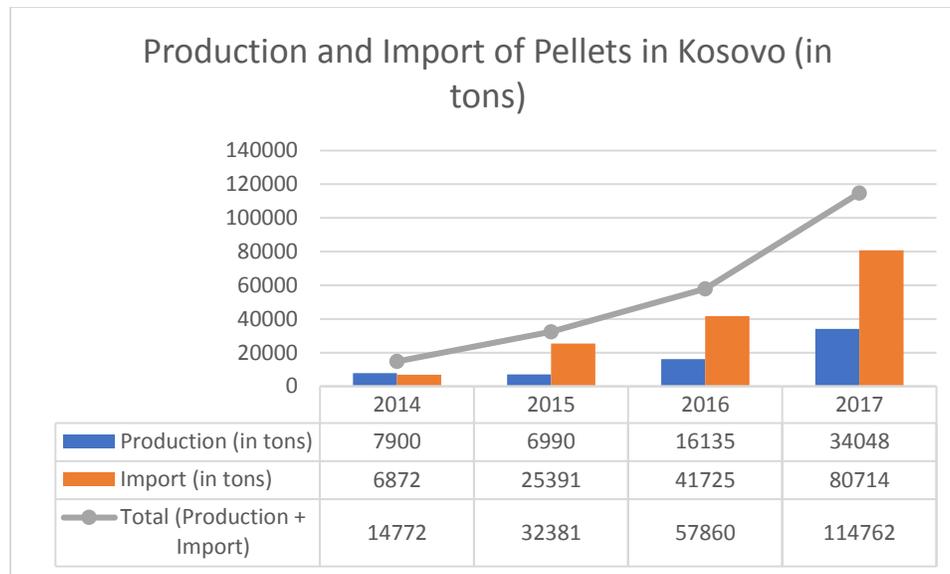


Figure 5. The quantity of annual pellet production and imports in Kosovo¹⁵
Source: Author's own calculations

4.2. Energy Efficiency

The energy efficiency sector presented in this study encompasses the following products: fiberglass mesh, paints, facades and lacquers, display cabinets, cooling chambers, ovens, and Styrofoam. For this study a total of 17 companies partaking in the production of these products were identified, out of which 13 provided information on their production. The value of estimated production of these products in 2015 was €19.1 million, while in 2016 this value increased by €3.26 million (17 percent) amounting to €22.36 million.

4.2.1. Fiberglass mesh

Fiberglass mesh is predominantly used as a commercial and residential thermal insulator. As an insulator, fiberglass slows down the spread of cold, heat, as well as sound in buildings. By trapping pockets of air, this type of insulation keeps rooms cool in the summer and warm in the winter, thereby serving as a convenient technique to increase energy efficiency. One of the reasons for fiberglass being a suitable choice for building insulation is that it poses no fire hazard and it is

¹⁵ The value of production is derived from the inputs of 15 companies that accepted to be part of the study.

cost effective – fiberglass insulation, compared to other insulating materials, has a lower installation price per equivalent thermal resistance. In an attempt to illustrate its energy efficiency benefits, the International Association of Certified Home Inspectors has estimated that thermal insulation made of fiberglass reduces residential energy costs by up to 40 percent¹⁶.

Domestic production of fiberglass in Kosovo has increased over the past few years. Imports have also increased by around €1.22 million or 52.5 percent, amounting to almost €3.5 million in 2017 as compared to €2.28 million in 2015. Domestic production in 2015 was around €379 thousand and increased by €272 thousand (64 percent) in 2016 to around €621 thousand. In 2017, the value of domestic production increased further reaching €1.06 million, an increase of 178 percent as compared to 2015. As a consequence of these changes, the total market value (domestic production and imports) in 2017 has surged to €4.53 million, representing an increase of €1.14 as compared to 2015. In this regard, the domestic production was accountable for 23.3 percent of the total market in 2017, a substantial improvement of around 9 percentage points in comparison to 2015.

The price of fiberglass in the domestic market did not change in this time-frame. Nonetheless, exports have increased, and the local market still experiences a solid demand for fiberglass mesh. This is shown by the increase in both imports and local production of the product. One of the interviewed companies revealed that they were focusing on exports, especially in the Albanian market, as this would increase profits for the company.

¹⁶ Gromicko and Shepard (2014), Fiberglass Insulation: History, Hazards and Alternatives

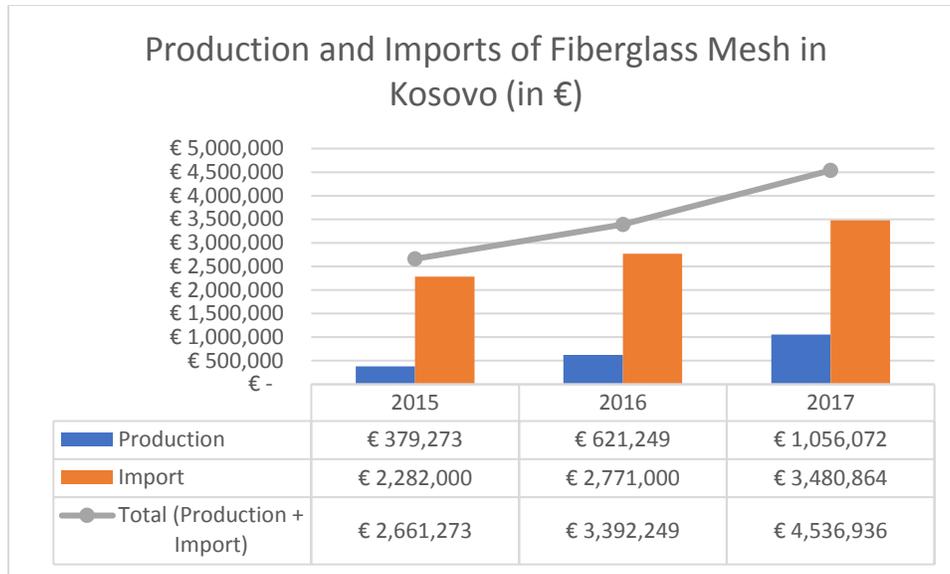


Figure 6. The value of production, imports, and exports of fiberglass mesh in Kosovo¹⁷
 Source: Author's own calculations

4.2.2. Paints, Lacquers and Facades

Paints, lacquers, and facades are substances used to protect or decorate surfaces which, after drying, convert into hard coatings¹⁸. According to data obtained from the Kosovo Customs, the import of paints and lacquers has not substantially increased in 2016 and 2017. As depicted in Figure 7, the value of imports of these products in 2016 was €33.16 million, which represents an increase of €2.56 million as compared to 2015. While in 2017, imports increased by €2.95 million compared to the previous year, amounting to €38.68 million.

To estimate the domestic production of these products, eight manufacturers were contacted. Nonetheless, only five provided inputs and the others exercised their right to not disclose the information. Therefore, a set of assumptions was made to estimate the domestic production of paints, lacquers, and facades. Taking into consideration the similarity in their market presence and their production capacities, the study assumed that these two companies produce at least 90 percent of the capacity of some of the companies that gave information on their production. Using the same logic, the third stakeholder in the market was assumed to produce at least 70

¹⁷ Participatory in this study were the only factories (2) that could be traced as fiberglass mesh manufacturers.

¹⁸ Merriam-Webster (2002), Paint Definition

percent of the production value of the aforementioned producers. The results of the estimations are shown below.

The estimated domestic production of paints, lacquers and facades shows an interesting trend. In 2016, local production grew by €1.69 compared to the previous year, reaching an amount of €9.57 million. In 2017, the production value expanded further by 5 percent. In other words, the production value ranged from approximately €7.88 million in 2015 to €10.09 million in 2017.

The total market value (estimated production and imports) of these particular products is estimated to vary from €41.04 million in 2015 to €48.77 million in 2017. A positive fact worth noting is that estimated local production maintained its share in the market in 2016 and 2017. In other words, in 2015, the share of estimated domestic production out of the total market was 19.2 percent, while in 2016 and 2017 it managed to expand, assuming more than 21 percent of the total share.

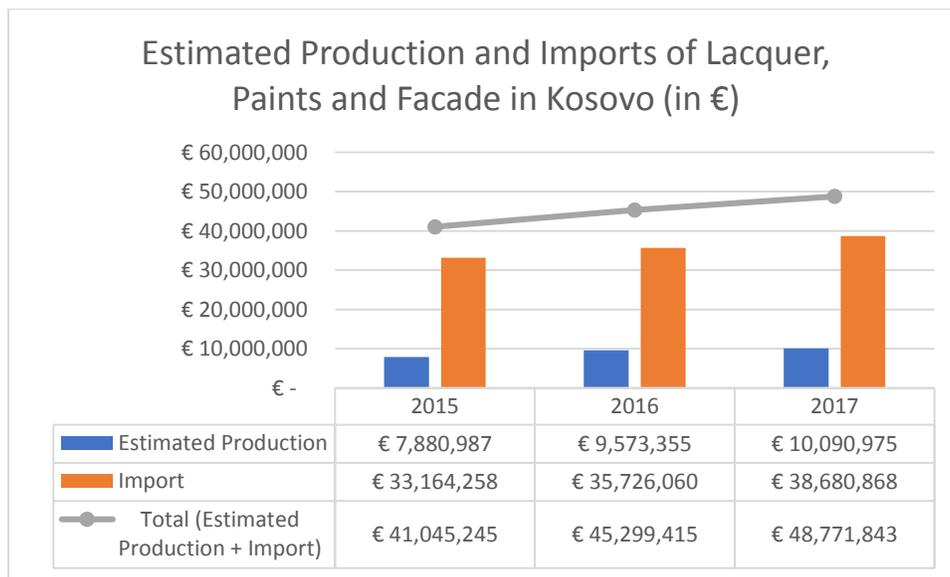


Figure 7. The value of production and imports of paints, lacquers, and facades in Kosovo¹⁹
Source: Author's own calculations

¹⁹ The value of domestic production includes 4 producers, 1 manufacturer has refused to become part of the study and 1 manufacturer could not provide answers due to technical difficulties.

4.2.3. Display Cabinets and Cooling Chambers

Information from the Kosovo Customs was not specific enough to allow comparison between import and export values for display cabinets and cooling chambers. That is because the category of display cabinets in the data is vague and includes many unrelated, not possible to filter, products. Also, the import data on quantity and euro amounts of cooling chambers was not provided by the Kosovo Customs.

The production of display cabinets and cooling chambers in Kosovo is depicted in Figure 8. The information was obtained from five identified manufacturers. The average price of display cabinets throughout this timeframe varied from €800 to €1,500, depending on the manufacturing company and the display cabinet type.

In 2014, the total number of display cabinets produced by the companies that were interviewed was 315. Expressed in monetary terms, the estimated value of display cabinets was around €272 thousand. In the following year, the number of manufactured display cabinets increased by 23 percent to almost €335 thousand. The same trend continued in 2016, where the production value reached €423 thousand through the manufacture of 451 display cabinets.

The domestic production of cooling chambers has increased significantly (by 322 percent) from 2014 to 2017. In 2014, the value of produced cooling chambers was €258 thousand, which rose in 2015 by 122.5 percent to €574 thousand. The upward trend in production continued in 2016 with 50.5 percent more production, reaching around €1.09 million in 2017.

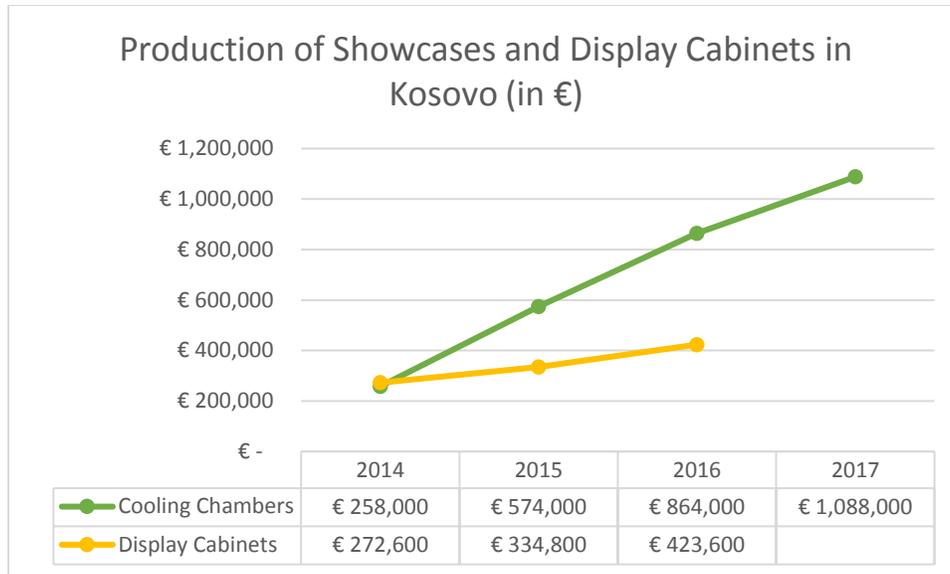


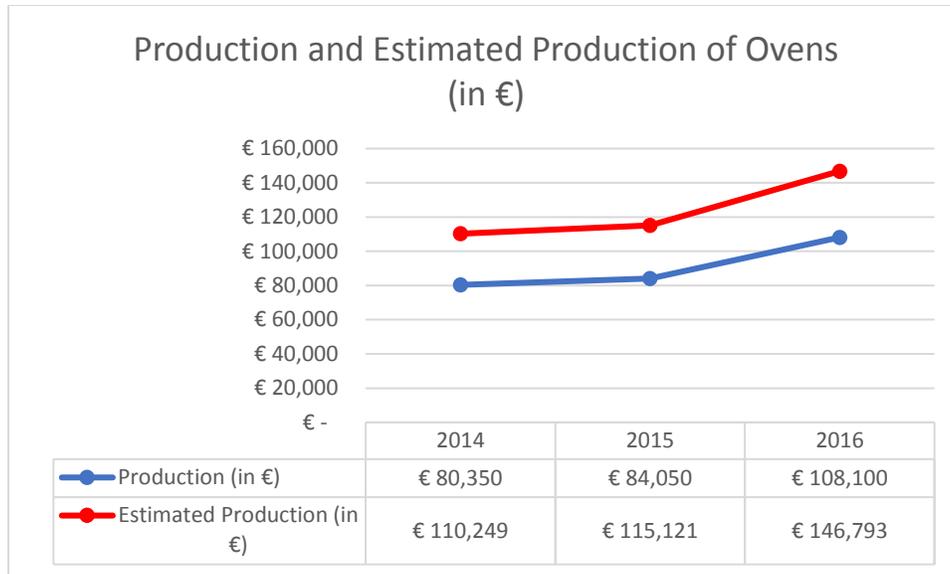
Figure 8. Display cabinets and cooling chambers' production in Kosovo²⁰
Source: Author's own calculations

4.2.4. Ovens

Ovens are enclosed chambers used to cook or heat food. Despite the many existing variations, due to the different operating characteristics or energy sources, the concept of the oven is about controlling the temperature²¹. It should be mentioned that the focus of the study are ovens used in hotels, restaurants or cafeterias (HORECA). In Kosovo, from 2014 to 2016, a total of €285 thousand worth of ovens were imported – an average of €95 thousand annually. The demand for such products is also complemented by the local production. Hence, for the purpose of this study, three manufacturers were contacted, out of which two provided information and one did not disclose any type of information.

²⁰ The value of production was calculated using the information of 5 identified manufacturers.

²¹ "What Are the Different Types of Ovens?"



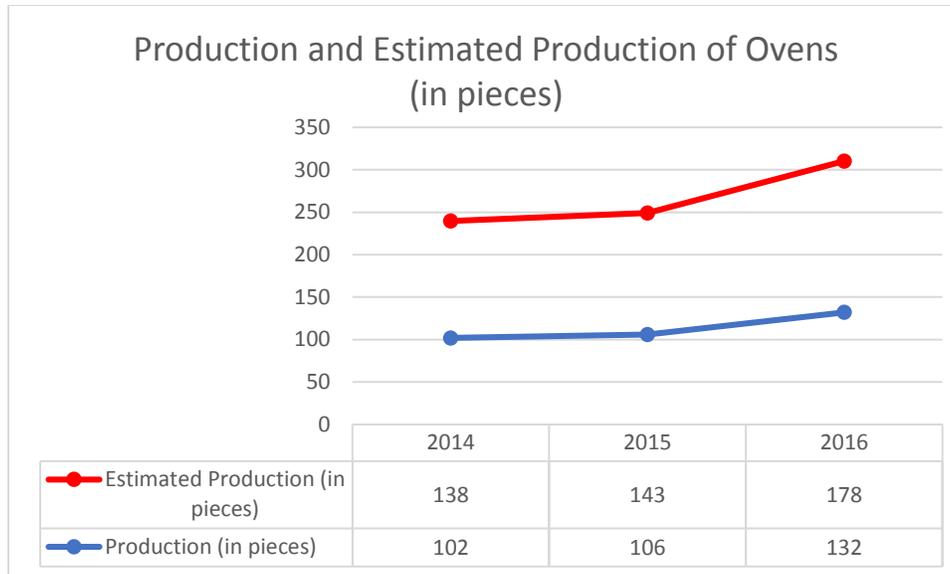
*Figure 9. The value of locally-produced ovens in Kosovo²²
Source: Author's own calculations*

As shown in Figure 9, the value of produced ovens was around €80 thousand in 2014 and 2015. In 2016, due to higher demand, the production of ovens increased by 28.6 percent, reaching €108 thousand. A set of assumptions were made to allow for the estimation of a production value for ovens. The derivation of this value includes the assumption that the manufacturer that refused to disclose information produces at least 70 percent of the other producers' average annual production²³. As a result, the estimated production value shows that the total local production (2014-2016) surpasses the total value of imports (2014-2016) by more than 30 percent. The cumulative value of the estimated production value in this timeframe is around €372 thousand.

Figure 10 depicts domestic production and estimated production in terms of quantity. The results show that each year at least 102 ovens were produced by the companies that were interviewed. The estimated production is positively correlated with the value of production and stands higher with at least 135 ovens manufactured annually. In terms of estimated production in 2016, an increase of 29 percent is noticed as compared to 2014. The price of ovens varied on the manufacturing company and ranged from €750 – €950 and did vary significantly per year.

²² Three companies have been identified and contacted, two of them have provided answers.

²³ See the methodology section for the set of assumptions used to estimated production.



*Figure 10. The quantity of production and estimated production of ovens in Kosovo
Source: Author's own calculations*

4.2.5. Styrofoam

Styrofoam is an extruded, closed-cell polystyrene foam, of significant importance in reducing the energy consumption of buildings²⁴. Domestic production of Styrofoam in Kosovo has increased steadily over the past few years, from 239,375m³ produced in 2014 to 268,325m³ produced in 2016. Average price per cubic meter (€40) has remained the same throughout this time, while the value of Styrofoam production has increased over time by more than €1 million. The value of domestic production of Styrofoam, as shown in Figure 11, was €9.57 million in 2014, €9.83 million in 2015, and it reached €10.73 million in 2016.

Styrofoam imports are not significant due to the high level of domestic production. In 2014 imports were 10 percent relative to the total value of production and in 2015 this value decreased to 8.3 percent. Although in 2016 there was a significant increase in the value of imported Styrofoam its value relative to domestic production remained below 23 percent. The value of imports for this product suffered a slight decline in 2015, dropping to €825 thousand from €976

²⁴ Forte EPS Solutions Inc (2014), Rigid High Density EPS Insulation in Ontario

thousand from 2014. The big change occurred in 2016, when imports rose by 190 percent to €2.4 million.

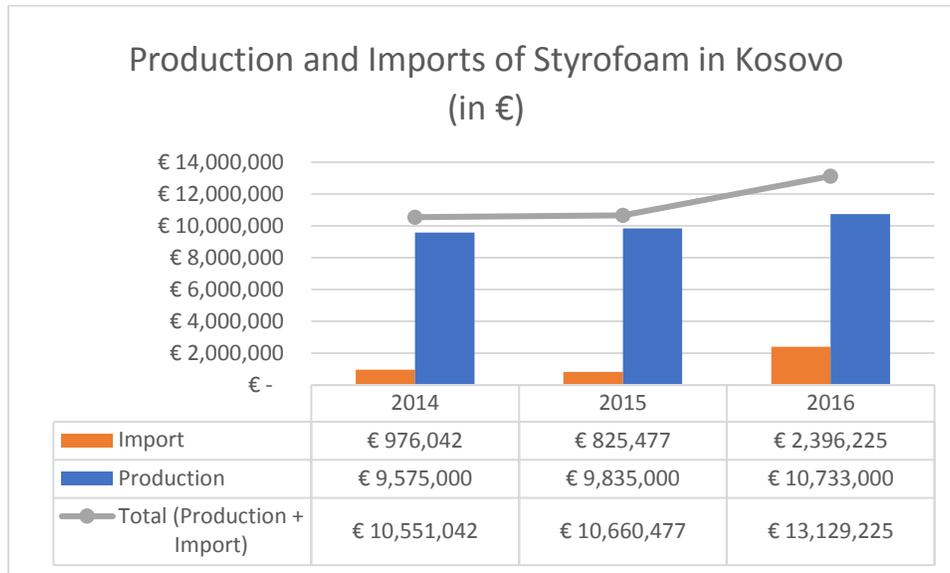


Figure 11. The value of Styrofoam production in Kosovo²⁵
Source: Author's own calculations

4.3. Renewable Energy

4.3.1. Photovoltaic Solar Panels

Solar power refers to the source of energy that comes from the sun and that can be converted into electrical energy through a certain device²⁶. Solar energy is a clean source of renewable energy and the utilization of such an energy source is done through solar panels²⁷. Many studies highlight that Kosovo has a significant potential in this aspect due to the abundance of solar radiation hours throughout the year. It is estimated that annually Kosovo has on average 278 sunny days and 2,000 hours of sun²⁸.

In this regard, the analysis of data suggests that Kosovars' demand for PV solar panels has increased. It is important to mention that in 2016, in Kosovo, the first solar panel manufacturing factory was opened. This catalyzed an interesting trend in PV solar panel sales within the country.

²⁵ The results include 4 of the largest manufacturers of Styrofoam in Kosovo.

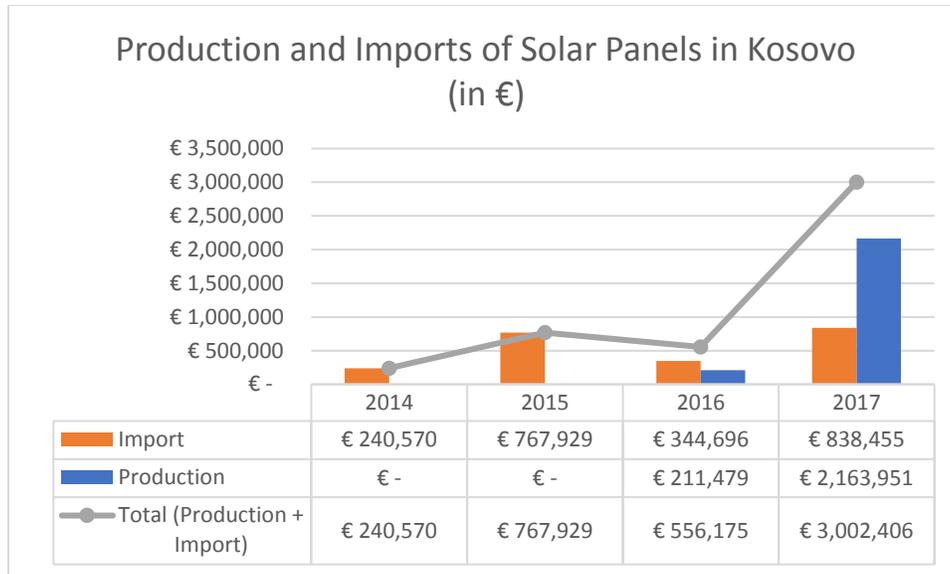
²⁶ "About Solar Energy."

²⁷ "About Solar Energy"; "What Are Solar Panels?"

²⁸ "Kosovo Must Do More for Renewables, EU Says – Pv Magazine International."

In 2014, based on Kosovo Customs data, all solar panels were imported and, as shown in Figure 12, the value of imports amounted to around €240 thousand. In 2015, the demand for PV solar panels more than doubled as the import figures increased by 219 percent, reaching approximately €769 thousand. In the following year, coinciding with the opening of the first PV solar panel manufacturing factory in Kosovo, the import value of PV solar panels decreased by 55 percent, as compared to 2015. The total domestic production during 2016 amounted to approximately €211 thousand, with around €556 thousand worth of PV solar panels purchased in Kosovo. Despite the added value in the market from the local manufacturer, the monetary value of both imported and locally produced PV solar panels in 2016, as compared to 2015, dropped by 27.6 percent. This drop can be attributed to the fall in price of PV solar panels worldwide. The data obtained from Kosovo Customs did not offer additional information (i.e. number of solar panels) to allow for a more detailed analysis.

In 2017, a substantial change on PV solar panel production was noticed (see Figure 12). The local production of PV solar panels increased substantially. The monetary value of PV solar panels produced domestically in 2017 increased by 923 percent compared to the previous year, amounting to €2.16 million. Meanwhile, imports reached the value of €838 thousand, an increase of 143 percent, as compared to 2016. In total, €3 million worth of PV solar panels were produced and imported, of which domestic production covered 72 percent of total consumption. Additionally, it is worth mentioning that a total of more than 20,100 PV solar panels have been produced locally in 2016 and 2017. The current pricing of the PV solar panels produced in Kosovo is €1,035 per kW for businesses and 1,635 per kW for households, excluding VAT.



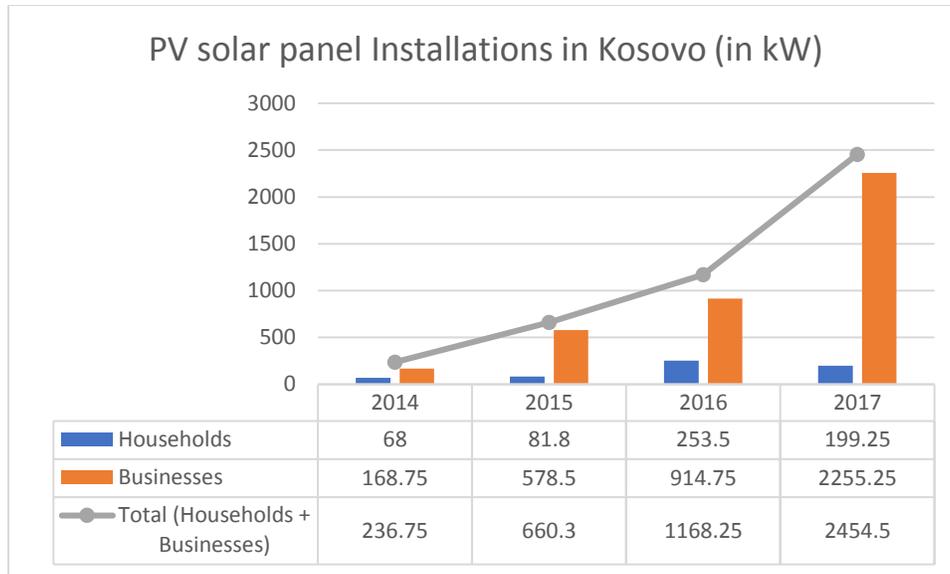
*Figure 12. The value of PV solar panel production and import in Kosovo²⁹
Source: Author's own calculations*

4.3.2. Photovoltaic Solar Panel Installations in kW

The production and import data show that the installation of PV solar panels in Kosovo has increased significantly from 2014 to 2017. As shown in Figure 13, during 2014 the installed PV solar panel capacity was around 237 kW. In the following years the amount of installations in terms of kW increased exponentially. During 2015, a total of 660 kW of PV solar panels were installed in Kosovo, representing an increase of 179 percent compared to the previous year. While, during 2017 the installed capacity amounted to 2,454.5 kW. The total capacity of PV solar panels that were installed from 2014 to 2017 was 4,519.8 kW (608 kW are part of the FIT³⁰, two projects installed in 2015 and 2016 with a capacity of 102 kW and 506 kW respectively).

²⁹ The results were extrapolated using the information obtained from the sole PV solar panel producer in Kosovo.

³⁰ Feed in Tariff



*Figure 13. PV solar panel installations (in kW) in Kosovo 2014-2017
Source: Author's own calculations*

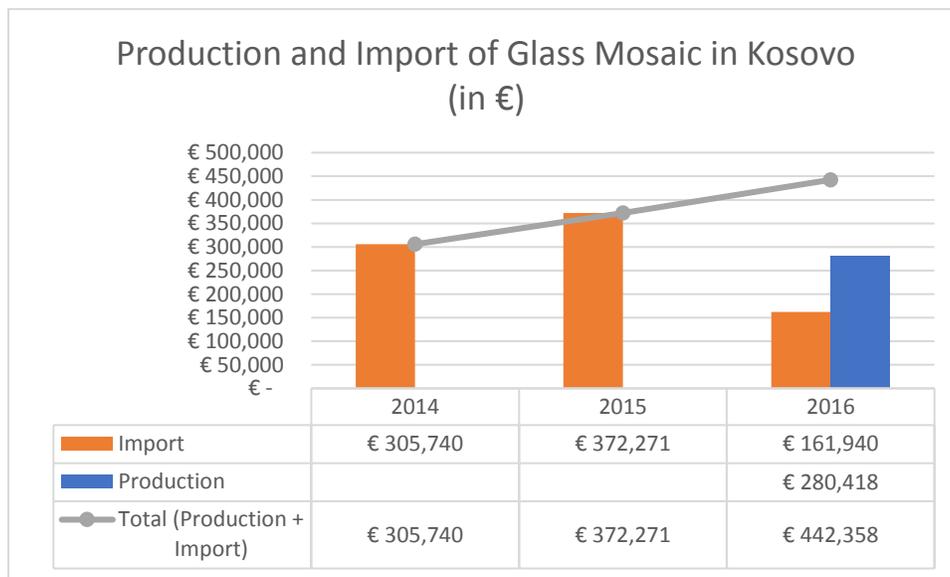
4.4. Recycling

The recycling sector in Kosovo is in its initial stages, although it is important to mention that plastic granules have been recycled for a while in the country. The glass recycling company which recycles glass and manufactures it into glass mosaic tiles was opened in 2016. Another product targeted by the study was motor oil that has been recycled since 2008. The joint yearly revenue (of the companies that were part of the study) of the recycled products presented below (glass mosaic and granules) in 2016 is estimated to be at least €2.73 million. In the years prior to 2016, this value was significantly lower due to the absence of earnings generated by the mosaic manufacturer.

4.4.1. Glass Mosaic Tiles

Glass mosaic tiles are tiles made out of glass which can be used in different shapes and forms for decorative purposes. There is one identified factory of this kind in Kosovo, which collects flat glass waste and recycles it with the purpose of producing glass mosaic tiles as an end product. The creation of its recycling supply chain was supported by USAID EMPOWER Private Sector.

Data from Kosovo Customs shows that, in 2014, a total of €305,750 worth of glass mosaic tiles was imported in Kosovo (see Figure 14). In 2015, an interesting development could be noticed – the total value of imported glass mosaic tiles increased by approximately €66.5 thousand, but the imported quantity decreased by around seven percent. This means that there has been an increase in the price of this product. The upward demand trend for glass mosaic tiles continued in 2016, when glass mosaic tiles started to be domestically manufactured. During 2016, the domestic production accounted for 63.4 percent of the market share³¹ of glass mosaic tiles. Around €280 thousand worth of glass mosaic tiles were produced locally, while approximately €162 thousand or 36.6 percent of the market was supplied from imports. It is important to mention that in 2017 this company has achieved to gather and recycle 700-800 tons of flat glass waste.



*Figure 14. The value of glass mosaic tile production and import in Kosovo³²
Source: Author's own calculations*

³¹ The market calculation in this case is equal to the sum of production and imports.

³² The results were derived from the information obtained from the sole glass recycler and glass mosaic tile manufacturer in Kosovo.

4.4.2. Granules

Plastic granules are small particles that are used to manufacture plastic products. These particles are in high demand because of the large variety of products that can be produced when granules are molded. There are a few factories in Kosovo that manufacture these types of products through recycling, three of which have been identified for this study. Granules produced from the recycling process of plastic are labelled as regranules. Two of the factories that recycle to manufacture regranules have voluntarily provided information for this study, whereas one of them could not be reached. Figure 15, contains an estimated production which was estimated using the assumptions presented under the methodology section.

Imports, as presented in Figure 15, vary from €15.34 to €18.85 million, depending on the timeframe. In 2014, the imports of granules amounted to €15.34 million, and in 2015 they rose by 6.3 percent, reaching a value of €16.3 million. A further increase was noticed in 2016, as the imported value of granules reached €18.85 million.

The estimated internal production of granules through recycling has suffered a considerable increase in 2016 as compared to 2014 – the production in this timeframe increased by €737 thousand (43 percent), amounting to €2.45 million. This figure actually denotes the minimum of regranules production. In other words, it can be said that in 2016, in Kosovo, at least €2.45 million worth of granules were produced – covering around 13 percent of the imports.

In total, the usage of granules and regranules, based on these figures, has increased significantly throughout the years. In 2015, the total estimated production combined with the import value reached €18.66 million, while in 2016 this amount increased by €2.64 million to reach €21.3 million.

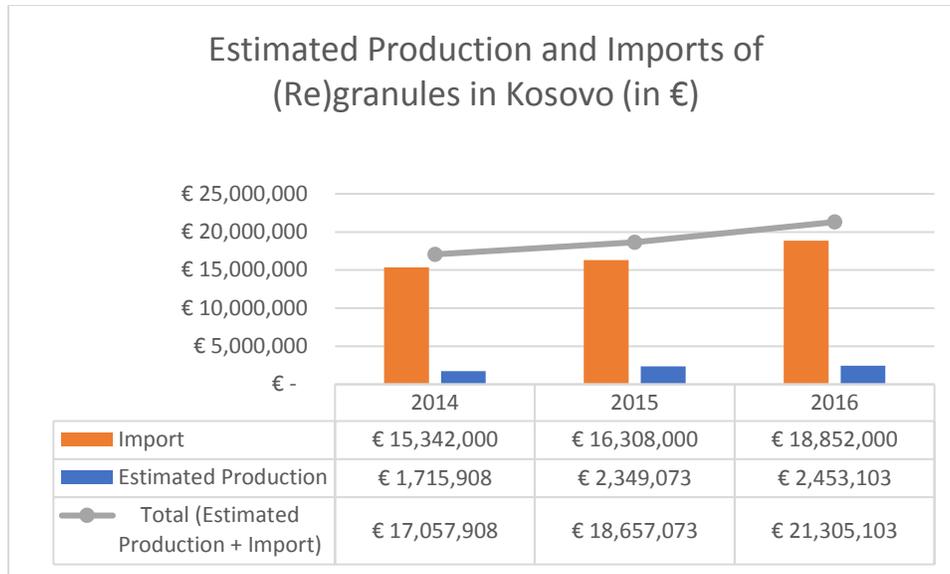


Figure 15. The value of granules production, estimated production and import in Kosovo³³
 Source: Author's own calculations

4.4.3. Motor Oil

The amount of motor oil imported in Kosovo has progressively increased from 2014 to 2016, a fact which is correlated to the increase in the number of vehicles registered in the country³⁴. In 2014, Kosovo imported 5,539,000 liters of oil, at a cost of €8,250,000. Figure 16 shows the amount of motor oil imported in 2015 increased by 12.4 percent, reaching a total of 6,226,000 liters, at a cost of €8,985,000. The amount imported in 2016 was 7,253,000 liters, representing a 16.5 percent increase from the previous year, at a cost of €9,598,000.

³³ The results include three identified granule recyclers.

³⁴ USAID Empower Private Sector (2016), Oil Recycling Supply Chain Assessment

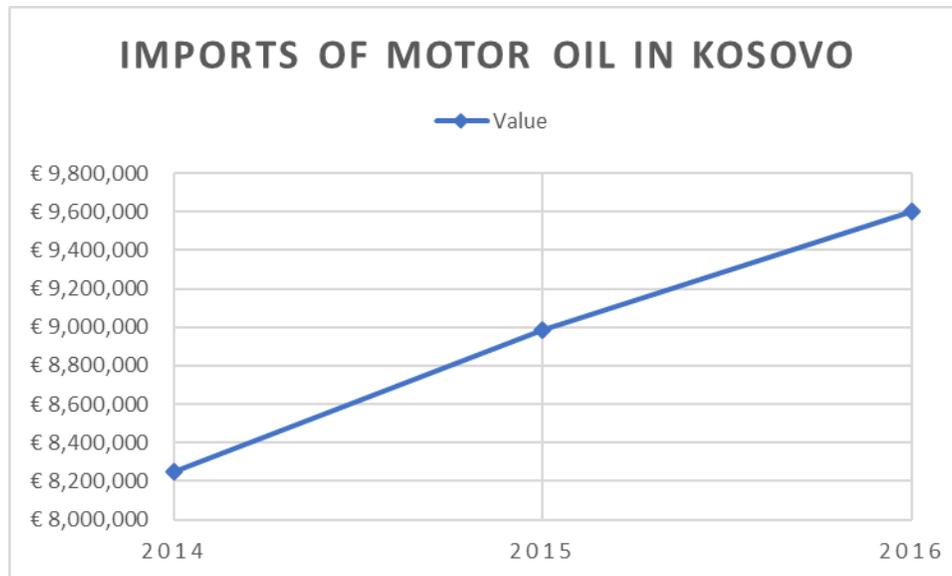


Figure 16. The value of motor oil imports in Kosovo
Source: Kosovo Customs data

5. Business Challenges

During visits at manufacturing plants for the purpose of this study, the representatives of the businesses highlighted several challenges that they face. Despite the different types of manufacturing processes all the producers noted that energy problems are causing them heavy financial damages indirectly and directly. Direct costs were damaged equipment, while indirect costs included the limitation in output production from the lack of electricity. An example to better illustrate this issue is that the production ability of one of the pellets producers was halved as a result of electricity cuts. Thus, instead of producing 8-9 thousand tons of pellets in 2017, they only managed to produce four to five thousand tons of pellets.

The other problem that a considerable number of these businesses face is the lack of skilled employees. Some of them declared that they are unable to expand their production capacity because of the lack of skilled employees in the market.

Lastly, it's important to note that the production of pellet as elaborated above has more than quintupled, however its potential is limited because of the lack of raw materials. This issue was emphasized by the vast majority of producers. As the analysis shows there is huge potential for

this industry and opting for alternative measures to obtain raw materials is a must. A study conducted by Martin Englisch, supported by USAID EMPOWER Private Sector suggests that one of the alternative solutions for this problem could be vine prunings³⁵.

6. Conclusion

Overall, the production sectors analyzed above have shown improvements. The energy efficiency sector analyzed in this study, with specific focus on ovens, lacquers, paints and facades, Styrofoam, display cabinets, cooling chambers, and fiber glass mesh, was estimated to have a market value of €61.8 million in 2016 and as a result it represents the sector with the highest market value. Out of this value, 34 percent or €21 million were covered by domestic producers. In this sector, fiberglass mesh has seen one of the highest increases in the amount of production. The domestic production value of this product in 2015 was €379 thousand and it increased by €671 thousand (178 percent) to €1.05 million in 2017. Paints, lacquers and facades were the subsector with the largest expansion in this category, as it grew by €2.20 million. It is important to note that, an increase in both the production quantity and value is prevalent in all other products falling in this category.

The recycling sector experienced a considerable increase in production in the past few years. Kosovo recycling producers that partook in this study include glass mosaic tiles and granules producers. The value of imported motor oil - which presents an interesting feature as it demonstrates the recycling potential of this product – has also been noted in the report. Glass mosaic tiles have been produced through recycling since 2016 and the production value amounted to around €280 thousand. Alternatively, the recycling of plastic materials to obtain regranules has been established in Kosovo for a considerable time. The production of regranules from 2014 to 2016 based on the inputs and assumptions built upon those inputs has increased by around €737 thousand. In total, the production value of these manufactures (glass mosaic tile and (re)granules) was €2.63 million in 2016. It is worth noting that the recycling sector targeted by this report, had a market value of €31.34 million in 2016.

³⁵ Martin Englisch, "Feasibility Study for Production of Briquettes and Pellets in Kosovo Using Agricultural Waste."

In general, the wood biomass sector has experienced substantial increase in both domestic production and imports. The total market value of the wood biomass sector in 2017, was around €29.7 million, out of which €11.2 million were produced domestically and €18.5 million were imported. As the analysis shows, this sector has huge potential due to the specifics it possesses. The quantity of stoves/boilers produced domestically has increased by €3.08 million (2015-2017), while the local produced quantity of pellet rose by more than 26 thousand tons (2014-2017), and the local production value increased by around €5.86 million reaching €7.15 million in 2017. The only product in this category that has experienced a downward trend in production is briquettes. In total the estimated production value of this sector from 2015 to 2017 has increased for €6.72 million reaching €11.32 million.

Renewable Energy is one of the sectors with the most interesting developments. The production of PV solar panels in Kosovo started symbolically in 2016, with around 1800 panels produced worth approximately €211 thousand. Nonetheless, this industry skyrocketed in the following year as the local production value increased to €2.1 million as a result of more than 18,000 domestically produced panels. The value of local production of PV solar panels, in 2017, was 258 percent higher than of imports.

The overall domestic production quantities and values have increased throughout the timeframe that was analyzed. Imports in some subsectors have been almost completely replaced (e.g. PV solar panels, Glass Mosaic Tiles, Styrofoam), and some are being gradually replaced (e.g. Pellet, Fiberglass Mesh, Paints, Lacquers and Facades), while others remained steady with minor or no declines in favor of imports, or there was no import data available for comparison. The only serious deterioration in both value of production and proportion with imports is observed with the production of briquette, which has diminished rapidly. Figure 17 depicts the domestic production and imports of USAID's EMPOWER Private Sector's focus subsectors analyzed in this report in 2015 and 2016.

DOMESTIC PRODUCTION AND IMPORTS OF EMPOWER FOCUS SUBSECTORS



Figure 17. USAID EMPOWER Private Sector's subsectors' domestic production and imports in 2015 and 2016 (in 000s) ³⁶

Source: Author's own calculations and Kosovo Customs data

³⁶ The domestically produced granules are actually (re)granules.

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