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**Policy Briefing for Improving Access of the Ukrainian Machinery, plant or laboratory heating equipment Sector to the EU under the AA/DCFTA**

The beneficiary of the project on this draft study is the Ministry of Economic Development and Trade of Ukraine.

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## ***Policy Briefing for Improving Access of the Ukrainian Machinery, plant or laboratory heating equipment Sector to the EU under the AA/DCFTA***

***Draft Analytical Study – March–June 2018***

*Stefan Moser, A4U STE*

The following evidence-based recommendations are built on analysis of the sector in Ukraine and EU and detailed consultations with business operators in the Machinery, plant or laboratory heating equipment sector.

# 1 Introduction

The analytical study conducted under the Association4U Project “Underperforming Sectors under the DCFTA” identified products/sectors where Ukraine’s market share in the EU is significantly less than its market share in world markets, despite the substantial benefits of the DCFTA. The reasons for “underperformance” could relate to policies in Ukraine, internal industrial problems in Ukraine, the AA/DCFTA regime itself, or market issues within the EU. Thus, to determine and possibly resolve existing constraints, the Project with the assistance of the Ukrainian National Chamber of Commerce and Industry, has consulted businesses in these sectors to determine the constraints they face. Based on these, a set of recommendations for Government Action have been suggested.

Once these recommendations have been presented, the Government of Ukraine can consider how to respond, including discussions with EU at trade and industrial dialogue committees, or, internal policy changes combined with business support measures (such as export promotion, education or other instruments). It will also decide on intra-governmental cooperation and work with other stakeholders to address and solve the constraints described hereafter.

Given access to EU provided by DCFTA, we would expect Ukrainian exports of machinery, plant or laboratory heating equipment to the EU to perform better than the rest of the World; that is Ukraine would be expected to have a bigger market share than it has in the rest of the world. However, Ukraine has on average over the last 3 years had about 91% less share of EU market than it has in the rest of the world. Therefore, this report investigates the issues constraining the sector in exporting to EU under the DCFTA and makes recommendations to Government to facilitate this potential through a set of concrete actions to support the sector.

## 2 Overview of the Machinery, plant or laboratory heating equipment Sector

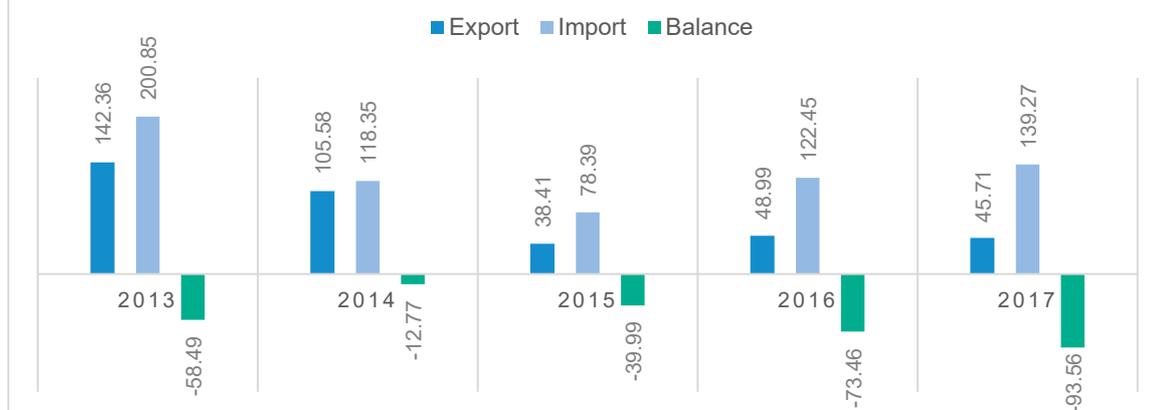
EU third country Imports <sup>1</sup>	Average Growth in EU Imports (2015-2017)
<b>€ 2.84 bn</b>	<b>+ 9.6 %</b>
Average Ukraine's global exports <b>€ 118.5 m (2011-2013)</b> <b>€ 38.8 m (2017 only)</b> presents 0.11% of world exports <sup>2</sup>	EU Imports from Ukraine <sup>3</sup> <b>€ 2.4 m (2017)</b> Growth/decline - 4.9%
Underperformance Score 2017  <b>0.83</b>  (moderate under-performance, however because generally weakened exports)  (average 2008 – 2014: <b>0.58</b> )  (Details in Appendix 6)	Possible Export potential  <b>€ 2.9</b>  (Based on 2011-2013: potential could reach <b>€ 7.6m</b> )

<sup>1</sup> Eurostat Comext (2017)

<sup>2</sup> www.trademap.org Accessed: June 2018

<sup>3</sup> Average Imports 2015-17 calculated from Eurostat Comext (2018)

## MACHINERY, PLANT OR LABORATORY HEATING EQUIPMENT SECTOR TRADE INDICATORS



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### Machinery, plant or laboratory heating equipment produced in Ukraine are exported by about 17 companies <sup>5</sup>

- Non-electric instantaneous or storage water heaters
- Heat exchange units
- Producer gas or water gas generators; acetylene gas generators and the like; distilling or rectifying plant
- Machinery, plant or laboratory equipment, whether or not electrically heated, for the treatment of materials by a process involving a change of temperature, n.e.c.
- Non-domestic equipment for cooking or heating food (excluding non-electric tunnel ovens, non-electric bakery ovens, non-electric percolators)
- Dryers for the treatment of agricultural products by a process involving a change in temperature

### Constraints faced by Ukrainian companies

- Compliance with EU technical regulations
- Limited Access to finance
- Electricity/energy deficiencies
- Technologies used in the sector
- Inadequately educated engineers and technicians
- Strong competition at the local market
- Other challenges facing the industry

<sup>4</sup> \$ million, based on Ukrstat

<sup>5</sup> [www.trademap.org](http://www.trademap.org) (July 2018)

### 3 Context

It should be recognised that the machinery, plant or laboratory heating equipment sector is not a stand-alone industry but is often vertically integrated. Machinery, plant or laboratory heating equipment need casings, mostly made of cast iron, thus integrated production with a foundry is essential. As an energy intensive industry, availability of and competitively priced energy is fundamental, but also of raw materials (iron ore and steel). In the Ukrainian industry landscape, these industries are often based in the centre or east of the country. It is understandable that through this position, trade integration mostly happened with CIS countries (Russia, Belarus, Kazakhstan).

### 4 Constraints to Export under DCFTA

To understand better the constraints faced by Ukrainian machinery, plant or laboratory heating equipment producers and reasons for their underperformance in the EU market despite the DCFTA, business consultation with industry associations as well as representative businesses between February and April 2018. These were held on a regional level in six strategic locations, facilitated by Chambers of Commerce and Industry in Kiev, Kharkiv, Dnipropetrovsk, Zaporizhzhya, Sumy and L'viv. Additional interviews with associations and businesses were held mainly in Kiev.

The machinery, plant or laboratory heating equipment sector reported many challenges arising in recent years that prevent exports to the EU under the DCFTA. There are different levels of problems reported, many are national issues adversely affect the underlying competitiveness of machinery, plant or laboratory heating equipment in the EU market, whilst others are more related to market and regulatory demands of the EU:

- **Compliance with EU technical regulations** is the most commonly named problem, which limits the machinery, plant or laboratory heating equipment industries ability to export to the EU. Companies do not understand the requirements of the machinery directive nor the low voltage directive (LVD),<sup>6</sup> which sets the main regulatory requirements for export to the EU for machinery, plant or laboratory heating equipment. Companies also complain that there are no testing facilities in Ukraine and its expensive abroad.

**Analysis of the reported issue:**

*GOST standards were largely used by Ukrainian producers and looked to be sufficient. Need for change was not evident based on the historical trade ties with CIS.*

*Nevertheless, Ukraine decided to largely adopt the EU system of quality infrastructure and the EU machinery and Low Voltage Directives (LVD) were incorporated into Ukrainian law back in 2013. EU DG GROW evaluated positively through concordance tables to confirm that these laws in Ukraine line up with the Directives and therefore national compliance would imply compliance with EU requirements.*

<sup>6</sup> For machines up to 1 000 volts

*Under the EU (and Ukrainian system) of conformity assessment (the way a firm proves it complies with technical requirements) is through either third-party conformity assessment (by accredited EU notified body) or through self-certification by using EU harmonised standards and accredited testing bodies.*

*NOTE: for LVD and machinery, the use of notified bodies is not mandatory – that is machinery, plant or laboratory heating equipment manufacturers can self-certify. Within Ukraine, National Accreditation Agency of Ukraine (NAAU) (and full member of International Laboratory Accreditation Cooperation - ILAC) is approved by European Accreditation to accredit Ukrainian-testing laboratories and such test results are legally acceptable in the EU. To date, NAAU has accredited 24 and 2 testing laboratories (IEC/ISO 17025) for machinery and LVD testing respectively that can be used by producers as part of the approval process (with additional 83 and 49 accredited conformity assessment bodies for calibration, product review and inspection of machinery and LVD).*

*UKRMETRSTANDARD (Ukraine's national standards body) has adopted on EU harmonised standards for machinery and LVD and MEDT regularly publishes the approved list of standards that convey compliance, which are identical to those of the EU. In addition, it is a companion member only open to DCFTA member of European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC). Thus, Ukrainian technical committees can fully participate in equivalent EU technical committees to develop and revise EU harmonised standards. However, gaps are still existing. The Strategy for the Development of the Technical Regulation System (including an action plan) until 2020 approved by CMU resolution in August 2015 is a good starting point for a broader national quality policy or strategy, which is required to reflect the next stage of NQI development in Ukraine.<sup>7</sup>*

*Therefore, the system is in place for machinery, plant or laboratory heating equipment producers to obtain regulatory approvals for export to the EU in Ukraine but based on discussions, the sector simply does not understand or know how to apply self-certification.*

*About Industrial standards, those need to be bought indeed from the relevant agencies or associations, but their cost is usually moderate. Ukrainian producers do eventually not understand market regulations leading to such industrial standards and their usefulness. Furthermore, they do not understand why they should buy those standards and why they are not available for free.*

- **Limited Access to finance** was cited as a major constraint to exporting under the DCFTA as firms cannot make investments and pay for compliance costs required to export. This includes the availability, cost and length of term of finance.

***Analysis of the reported issue:***

*Domestic financing is important for SMEs as very low percentage of them can raise foreign capital: 87% of small firms and 82% of medium enterprises indicate that they do not attract foreign investment. More than 60% of SMEs claim to need a loan. But only 15% of small firms*

<sup>7</sup> <http://documents.worldbank.org/curated/en/407381501738384776/Ukraine-national-quality-infrastructure-gap-assessment>

and 22% of medium firms take advantage of bank loans or lines of credit, lagging peer countries.<sup>8</sup>

It is well understood that the Banking system in Ukraine is risk adverse and that conditions (collateral as well as cost) limit the access to loans,<sup>9</sup> especially SMEs. However, Financial Institutes (FI) and IFIs<sup>10</sup> both highlight low levels of financial literacy amongst the private sector and lack in knowledge of available banking products. Many Banks now support SMEs in preparation of application as a facilitation service. However, Banks are reluctant to issue long-term “hryvnia” loans given volatility of exchange rates and especially with the dependence upon IMF periodic injections.

The analysis revealed the following main factors constraining the lending to the economy of Ukraine in today's conditions:

- a slowdown in the economic growth,
- increasing economic and political risks of inflation and devaluation expectations,
- rapid fluctuations of exchange rate,
- a high cost and the lack of credit because of insufficient domestic resources and the mismatch of terms and conditions of bank loans with the aim to attract resources,
- a significant credit risk and imperfect methods of management,
- the lack of clear mechanisms for loan repayment applicable to insolvent borrowers, and
- inadequate protection of the rights of lenders and borrowers.

Risk protection against risks arising for one individual transaction in international trade-related issues is not provided. The “Export Credit Agency”, institution to provide insurance cover against the non-payment of export claims due to commercial and/or political risks was not (yet) established in Ukraine.

The "Law of Ukraine on Providing for Large-Scale Export Expansion of Goods (Works, Services) Originating in Ukraine through Insurance, Guarantees and Cheapening of Export Credits"<sup>11</sup> that was adopted on 20 Dec 2016 established the legal basis for establishment of the Export Credit Agency to encourage the export of Ukrainian goods (works, services).

Insolvency law should be revised to allow sufficient protection of lenders and borrowers and thus favour fair lending to SMEs.

Holding foreign currency should be enabled and macro-financial stability found to stabilise on a long-term basis the local currency. Therefore, the measures should be taken to transform the Ukrainian financial sector into a transparent, fair, and diversified system that supports businesses of all sizes and serves the needs of the business community (and all the people) and raises confidence among investors.

- **Electricity/energy deficiencies** contribute to the lack of competitiveness of the machinery, plant or laboratory heating equipment producers in Ukraine. This includes the high cost, lack of reliability and availability.

<sup>8</sup> [http://www.eib.org/attachments/efs/economic\\_report\\_neighbourhood\\_sme\\_financing\\_ukraine\\_en.pdf](http://www.eib.org/attachments/efs/economic_report_neighbourhood_sme_financing_ukraine_en.pdf)

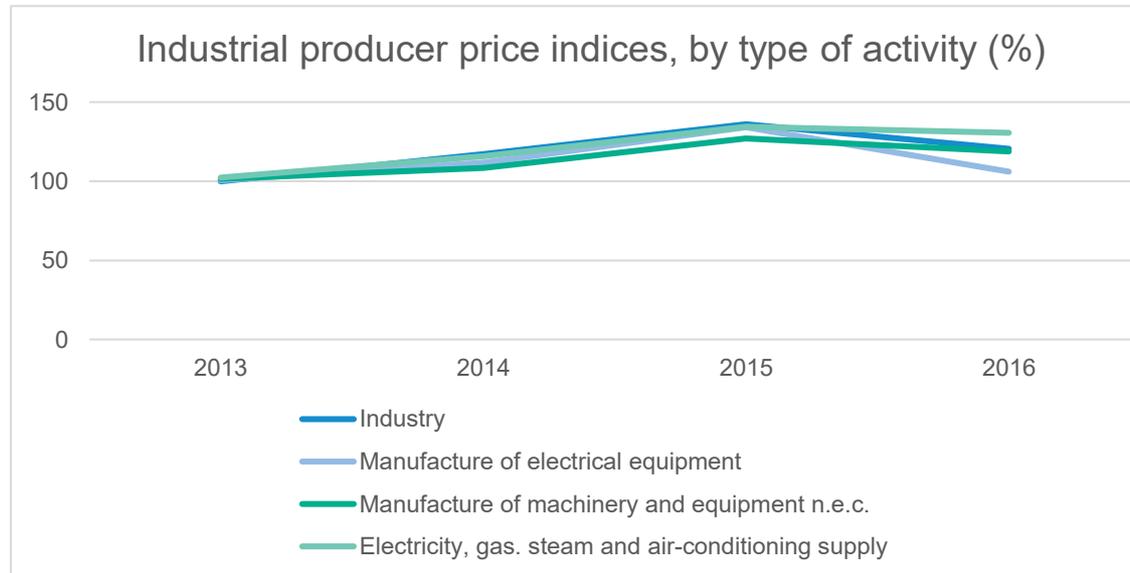
<sup>9</sup> <http://jem.pb.edu.pl/data/magazine/article/519/en/manzhos.pdf>

<sup>10</sup> [http://www.eib.org/attachments/efs/economic\\_report\\_neighbourhood\\_sme\\_financing\\_ukraine\\_en.pdf](http://www.eib.org/attachments/efs/economic_report_neighbourhood_sme_financing_ukraine_en.pdf)

<sup>11</sup> <http://zakon5.rada.gov.ua/laws/show/1792-19>

**Analysis of the reported issue:**

- In 2015 net costs (excluding GVA) of electrical equipment manufacture included 4% of electricity, gas, steam and air-conditioning supply and machinery and equipment n.e.c. manufacture included 6.9%<sup>12</sup> The shares of these productions in total energy consumption are 0.4% and 1.1% relevantly.



- However Intermediate consumption, also called "intermediate expenditure" in manufacture of electrical equipment makes 70.7% and in manufacture of machinery and equipment n.e.c. – 68.8%.
- Intermediate consumption includes other energy components (natural gas, coke etc.). The biggest share of expenditures is metallurgy.

<b>Main positions included in intermediate expenditures (%)</b>	<b>Electrical equipment</b>	<b>Machinery and equipment n.e.c.</b>
Mining of crude oil and natural gas	1,8	3,5
Manufacture of coke, and refined petroleum products	3,6	0,1
Manufacture of chemicals and chemical products	4,3	2,2
Manufacture of rubber and plastics products, and other non-metallic mineral products	8,3	3,3
Metallurgy production	31,2	28,7
Manufacture of basic metals and fabricated metal products, except machinery and equipment	2,5	7,7
Manufacture of computer, electronic and optical products	6,2	1,3
Manufacture of electrical equipment	5,3	0,9
<b>Manufacture of machinery and equipment n.e.c</b>	<b>8,4</b>	<b>15,2</b>
Electricity, gas, steam and air-conditioning supply	4,0	6,9
Wholesale and retail trade; repair of motor vehicles and motorcycles	8,6	9,8
Transportation and storage, postal and courier activities	4,5	4,4
Financial and insurance activities	2,4	3,9
Other	8,9	12,1

<sup>12</sup> [http://ukrstat.gov.ua/druk/publicat/kat\\_u/2017/zb/05/zb\\_tv\\_15\\_w.zip](http://ukrstat.gov.ua/druk/publicat/kat_u/2017/zb/05/zb_tv_15_w.zip)

- *Gross value added of Manufacture of electrical equipment is 29.3% (including wages 16.7%) and Manufacture of machinery and equipment n.e.c - 31.2% (wages 22.3%) relevantly.*
- *Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The country with the highest value in the world is Puerto Rico, with a value of 95.49. The country with the lowest value in the world is Sudan, with a value of 2.90.<sup>13</sup>*
- *In the 2nd half of 2017 average prices of natural gas for non-residential consumers with VAT and considering transportation and distribution tariffs was UAH 247.97 for 1 GJ or UAH 9183.99 per 1K m<sup>3</sup> (given under the metering reference conditions at 15°C).<sup>14</sup>*
- *Estimating the exchange rate of UAH/USD as UAH 28.0672 for 1 dollar (31.12.2017)<sup>15</sup> the price of natural gas for non-residential consumers can be considered as \$ 8.8 for 1 GJ.*

*World Bank Natural Gas Price Forecast for Europe<sup>16</sup>*

*(nominal US dollars (\$/MMBtu)*

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
10.05	7.26	4.56	5.50	5.66	5.83	6.00	6.17	6.35	6.54

- *European gas prices were rather stable between March and July 2017 but started to rise from August, helped by a combination of factors, including injection demand, continuing coal-to gas switching, rising oil and coal prices, increasing seasonal demand and persistent concerns about French nuclear availability. In the fourth quarter, TTF averaged 6.6 USD/MMBtu (19.2 Euro/MWh). The average German border price was lower (6.1 USD/MMBtu or 17.6 Euro/MWh), especially in December, when falling oil-indexed prices put pressure on the price of gas imported under long-term contracts.<sup>17</sup>*
- *Production costs appear to be highly dependent on the price of energy.*

*Therefore, lot of problems seem to be connected to the energy sector because economy is very inefficient. Furthermore, the dominance of a few stakeholders in the market limit access to competitive energy thus GoU should seek to liberalise energy sector as well as strengthen the role and independence of the "National Commission for the State Regulation of Energy and Utilities of Ukraine" (NEURC) to perform its mandate and shield it from political influence.*

- **Technologies used in the machinery, plant or laboratory heating equipment sector** are reportedly **out-dated** and lagging the European industry.

**Analysis of the reported issue:**

<sup>13</sup> <https://www.indexmundi.com/facts/indicators/NV.IND.TOTL.ZS>

<sup>14</sup> [http://www.ukrstat.gov.ua/operativ/operativ2018/energ/ser\\_cin\\_gas/ser\\_cin\\_gas\\_e/ser\\_cin\\_gasll\\_e.htm](http://www.ukrstat.gov.ua/operativ/operativ2018/energ/ser_cin_gas/ser_cin_gas_e/ser_cin_gasll_e.htm)

<sup>15</sup> <https://finance.i.ua/nbu/?d=31&m=12&y=2017>

<sup>16</sup> <https://knoema.com/ncszerf/natural-gas-prices-forecast-long-term-2017-to-2030-data-and-charts>

<sup>17</sup>

[https://ec.europa.eu/energy/sites/ener/files/documents/quarterly\\_report\\_on\\_european\\_gas\\_markets\\_q4\\_2017\\_final\\_20180323.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q4_2017_final_20180323.pdf)

- *The existing system, in practice shows the lack of the financial and any other assistance from the government for the development of these relations.*
- *The number of machine building enterprises engaged in innovation activity, constantly shrinks; the share of innovative products in the industrial output was only 3-4% in 2010-2013, decreasing to 1.4% in 2015<sup>18</sup>.*
- *According to Ukrstat the degree of depreciation of capital assets, by type of economic activity (percent)*

	<b>2013</b>	<b>2014</b>	<b>2015</b>
<i>Total</i>	<i>77,3</i>	<i>83,5</i>	<i>60,1</i>
<i>Industry</i>	<i>56,9</i>	<i>60,3</i>	<i>76,9</i>
<i>Manufacturing</i>	<i>50,1</i>	<i>56,9</i>	<i>75,8</i>

- *Putting new capital assets into service, by type of economic activity in 2015 accounted UAH 216,697 m that is 30% more than in 2013 (UAH 165,769 m). 25.8% share of total new capital assets in 2015 made industry that accounted UAH 55,930 m. and decreased by 16.7% compared to 2013. Manufacturing amounted UAH 34,118 m and increased by 1.2% compared to 2013.*

*Therefore, the national innovation system in Ukraine includes a set of legislative, structural and functional components that determine the legal, economic, organizational and social conditions for the innovation process, but internal circumstances prevent this mechanism from effectively making today.*

*The effective development of machine building industry is possible only through the broad integration of intellectual, financial and industrial resources of high-tech industries through international cooperation.*

- ***Inadequately educated engineers and technicians*** available in the workforce means that improvement in quality and design of machinery, plant or laboratory heating equipment is constrained. This lack of qualified workers is related to acute brain drain in Ukraine.

***Analysis of the reported issue:***

- *Industrial (machine building) professional area includes several occupational groups, from machine tool operators to chief engineers and directors.*
- *Interviews with industry employers and experts showed that entry-level students were viewed as underprepared and that there was a demand for a more specialized core curriculum for entry-level employees.<sup>19</sup>*
- *In 2016 number of employees for enterprises, departments, organisations, by industrial manufacturing economic activity decreased by 43.3 thousand persons (from 1447.4 persons in 2015). Number of registered unemployed in that sphere also decreased in 2016 to 45.3 thousand persons (15.6 thousand persons less than in 2015). However, employers' demand for employees to replace vacant work places increased from 5.1 thousand persons in 2015 to 7.8 in 2016 (burden per one vacant work place dropped from 12 to 6 persons).<sup>20</sup>*

<sup>18</sup> [http://www.ukrstat.gov.ua/operativ/operativ2005/ni/ind\\_rik/ind\\_e/2002\\_e.html](http://www.ukrstat.gov.ua/operativ/operativ2005/ni/ind_rik/ind_e/2002_e.html)

<sup>19</sup> Skills for a Modern Ukraine <http://dx.doi.org/10.1596/978-1-4648-0890-6>

<sup>20</sup> Ukrstat Statistical Yearbook of Ukraine 2016

- *Recruitment rate in industry is higher than retirement rate (percent of averaged payroll staff). Recruitment rate – 20.9% in 2015 23.6% in 2016. Retirement rate in industry – 28.1% in 2015 and 27.9% in 2016.*
- *Percent of the time-book working hours fund in industry in 2016 was 84% (less than average 84.1%). Hours per one regular employee not fulfilled by reasons of holidays without wage 9 (average 4) due to economic reasons transferred to part-time job 38 (average 14). Similar situation is in for all industrial activities. In 2016, for Manufacture of machinery and equipment 92 hours were not fulfilled by reasons of holidays without wage or due to economic reasons.<sup>21</sup>*

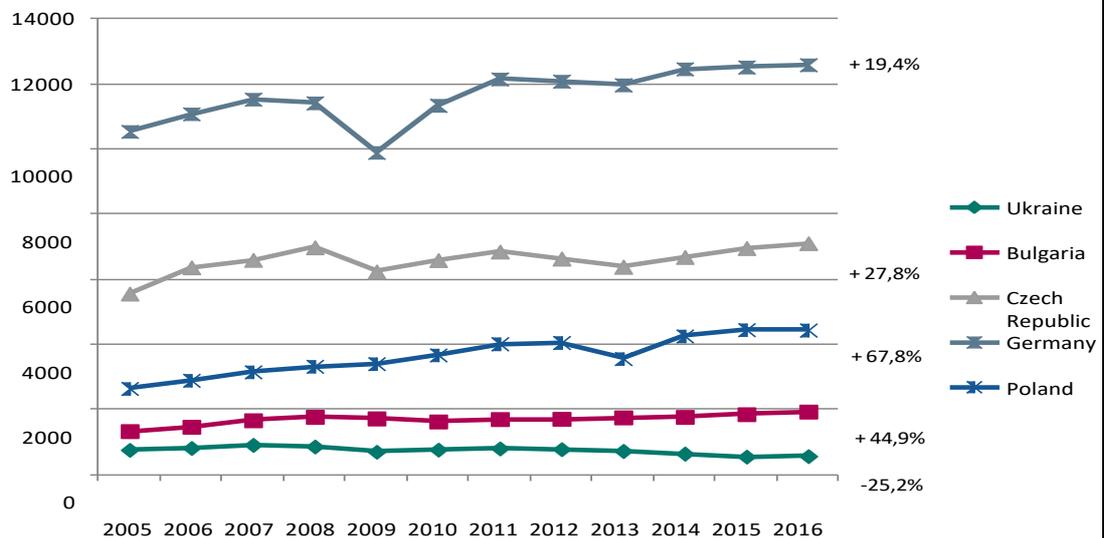
*Therefore, industry and employers receive limited support from the government for skills upgrading. On the other hand, industry dialogue with training providers is weak. Measures to make manufacture more productive.*

- **Low labour productivity** (output versus cost) is considered very low, and low motivation and quality minded work force.

**Analysis of the reported issue:**

- *Ukraine's Labour Productivity improved by 3.21 % YoY in Dec 2017, compared with a growth of 3.05 % in the previous quarter. In the latest reports, Ukraine's Population reached 42.22 million people in Dec 2017. Its Unemployment Rate increased to 9.90 % in Dec 2017. Monthly Earnings of Ukraine stood at 288.11 USD in Feb 2018. The country's Labour Force Participation Rate dropped to 61.50 % in Dec 2017.<sup>22</sup>*

**Industrial value added per capita (industrial capacity) between 2005 and 2016 (in USD)**



Source: Calculations based on <http://data.worldbank.org/indicator> (last accessed 26 September 2017): industry value added and population.

- *The average wage in Ukraine is low, which according to a Wikipedia comparison makes Ukraine the lowest wage country in Europe. Other indicators of labour productivity aren't impressive either: The World Bank estimates Ukraine's GDP per*

<sup>21</sup> Ukrstat Statistical Yearbook of Ukraine 2016

<sup>22</sup> <https://www.ceicdata.com/en/indicator/ukraine/labour-productivity-growth>

*capita at about 3000 USD, Ukraine' Gross National Income at about 3500 USD. This level of GDP per capita makes the World Bank classify Ukraine as a 'Low Middle Income country', a classification Ukraine share with countries like Mauretania, Bolivia or Mongolia.<sup>23</sup>*

- *Labour productivity is supposed to support competitive economy or an individual enterprise and affects the created product and welfare and rising incomes of the employees.*
- *Labour productivity requires investment in education and infrastructure.*

*Ukraine has a significant supply of unused labour because of relatively high unemployment. Additionally, Ukraine has a low rate of participation in the labour force. GoU has also to stop the unfavourable balance between recruitment and retirement of work force. It looks like retirement was a quick fix for the imminent structural problems of certain industries but with heavy burden on the strained state budget (pensions).*

*Specific incentives and reorientation could also enhance the current VET system of Ukraine, to better prepare apprentices and motivate them to work in Ukrainian factories (and thus contain the brain-drain of the qualified workers). Companies offering direct apprenticeship have a higher probability to retain the workforce in the own company (i.e. successfully implemented in Switzerland)<sup>24</sup>. The initial investment into apprentices is often well-recovered by the companies through having well-trained and educated work force. This system would also allow the GoU to reduce the need for appropriate technical schools.*

*In addition, there would be considerable room for improvement in labour productivity if Ukraine managed to transfer the workforce from its shadow economy to the formal economy.*

*Finally, industrial upgrading should be envisaged to climb the value-chains and create more value-added from manufacturing.*

- ***Inadequacies in the operation of the VAT system in Ukraine*** is cited as inhibiting competitiveness of machinery, plant or laboratory heating equipment producers and limiting daily operations. Enterprises complained that they must pay VAT on inputs to production whose reclaim (drawback), through the VAT system is delayed for years. This delay places excessive financial burden on the enterprises as their cash is unnecessarily tied up with these unpaid VAT repayments and with VAT inspectors deciding refunds, there is a good deal of corruption reported. Moreover, VAT is reportedly also levied unnecessarily on value of exported goods that again can be reclaimed by the seller, but with the usual delays. It was also reported that FDIs get tax exemptions including VAT on capital whilst local investors must pay VAT which is discriminatory and discourages needed investment to modernise the machinery, plant or laboratory heating equipment sector.

***Analysis of the reported issue:***

<sup>23</sup> <https://voxukraine.org/en/ukraines-labor-force-producing-little-with-lots-of-education-or-why-comprehensive-reforms-are-needed-eng/>

<sup>24</sup> <http://ncee.org/wp-content/uploads/2015/03/SWISSVETMarch11.pdf>

*All VAT invoices<sup>25</sup> must be registered in the electronic register maintained by the tax authorities and all VAT reporting must be undertaken electronically. Under the general rule, the amount of VAT payable to, or refundable by, the government is determined as the difference between the amounts of output VAT and input VAT for a given reporting period. If input VAT exceeds output VAT, the difference must be used to settle VAT debts (if any) accumulated in previous VAT periods. Where there are no such debts, the taxpayer may claim a VAT refund. To obtain a VAT refund, the tax authorities by means of a VAT refund audit must confirm the amount claimed. Any refund will be subject to review within the framework of a scheduled full scope tax audit.*

*In April 2017, the government announced an electronic register that automatically refunds value-added tax (VAT) owed to exporters to eliminate the need for tax audit on these transactions.*

*More than one year, many companies in Ukraine are deprived of the opportunity to receive “old sums” of budget refunds of VAT, which were declared before February 1, 2016. The Tax Code of Ukraine provided for the creation of the Temporary Register of applications for refunds of budget reimbursement of VAT filed before February 1, 2016, till February 1, 2017 but it has not been formed yet.<sup>26</sup>*

*The Government of Ukraine the Verkhovna Rada of Ukraine registered Draft Law #7518, dated 19 January 2018, which provides the registration of taxpayers’ applications to the Temporary Register the day after receiving a decision on the results of the administrative appeal procedure or a court decision that has acquired legal force.*

*Not all problems could be cleared – the state has “old debts” to business regarding VAT refund according to applications submitted before February 1, 2016, i.e. prior to the launch of the public VAT refund registers.<sup>27</sup>*

*Therefore, the potential for delays and uncertain levels of VAT refunds due to companies in this (and all sectors) is onerous and a constraint to competitiveness in the sector, discourages export and investments. It severely limits the ability of firms in the machinery sector to take advantage of the DCFTA (especially given exceptions in VAT to Agriculture and current agricultural export prejudice in Ukraine’s exports to the EU suggest some correlation).*

Other challenges facing the machinery, plant or laboratory heating equipment industry in Ukraine were:

- Low trust in Government, which also hampered the collection of data for this study as some companies didn’t want even to participate in the survey;
- Company raiding is still an issue apparently, while some business men expressed the view that this negative issue got better under the actual Government than the pro-Russian one before;
- Corruption persisting, this would also extend beyond Pro-Zorro and for any Government action;

<sup>25</sup> <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-ukraineguide-2017.pdf>

<sup>26</sup> <https://eba.com.ua/progress/95994-2018-02-20-14-00/>

<sup>27</sup> [http://old.kmu.gov.ua/kmu/control/en/publish/printable\\_article?art\\_id=250596017](http://old.kmu.gov.ua/kmu/control/en/publish/printable_article?art_id=250596017)

- Environmental degradation: in one oblast, it was noted that important foreign investors left a big investment because pollution issues.

## 5 What government should do to help

During the consultations, the most often cited issue raised was about not meeting technical standards. Other problems cited mostly concern market-internal problems in Ukraine. Some might be latent since long time, this ranges from corruption allegations to problems with the VAT system, and financial system in general (lack of credit).

The resolution of problems does not always need new resources or plans but it can fit or complement the implementation of current Governmental initiatives or help accelerating them. This applies especially for the Action plan for the implementation of the SME Strategy as well as the Export Strategy of Ukraine, or also the eventually upcoming Industrial strategy.

This study also stresses that communication is an essential tool for solving not only problems, but also fighting prejudices about Government work. Thus, it is essential that Government communicates in a formal way with private sector and replies with the sectors concerned.

In order that the machinery, plant or laboratory heating equipment manufacturing sector of Ukraine can take advantage of the DCFTA and begin preparing for and exporting to the EU, the following actions are recommended:

### **1. Support the Machinery, plant or laboratory heating equipment Sector comply with EU technical regulations**

- Explaining the system and requirements for compliance and what is already available in Ukraine, eventually empowering NAAU to further promote its functions and technical standards;
- Implement the Strategy for the Development of the Technical Regulation System (including an action plan);
- Developing systems/business support services for conformity assessment (especially self-certification procedures), i.e. through Innovation centres, Techno-parks and Incubation centres, Quality and Technology awards, Quality and Training Centre;
- Developing and facilitating intra-industrial dialogue to facilitate further consultation work of the Government but also to form a tissue of trustable industry associations representing the industry interests;
- Enhance and facilitate cooperation and knowledge sharing among the business community itself;
- Continue and intensify the High-level Industrial Dialogue with the EU, eventually adapting the working groups to key sectors with real economic potential; adapt “Roadmap of the Ukraine-EU Industrial Dialogue” accordingly.

## **2. Access to finance – favour direct investment**

- Implement immediately the "Law of Ukraine on Providing for Large-Scale Export Expansion of Goods (Works, Services) Originating in Ukraine through Insurance, Guarantees and Cheapening of Export Credits"<sup>28</sup> adopted on 20 Dec 2016;
- Create (productive, targeted) tax or other incentives for investment (tax relieves on investment capital, employment measures, industrial upgrading) to facilitate Ukrainian and not only foreign direct investment;
- Revision of the financial system of banks, allowing to hold foreign currency accounts to minimize currency risks (one of the risk mitigation measures European enterprises adopt);
- Insolvency law should be revised to allow sufficient protection of lenders and borrowers and thus favour fair lending to SMEs.

## **3. Modernisation of production/design**

- Create innovation fund for SMEs access to credit for high value-added industries to cover investment, development and marketing of new products.
- Encourage Research & Development across industrial clusters (i.e. spending in EU amongst machinery sector is 5-6% according McKinsey) to allow industries to close the technological gap with European competitors;
- Adapt VET to the needs of the specific machinery clusters (i.e. the machinery, plant or laboratory heating equipment);

## **3. Workers and skills development**

- Evaluate achievements of actual TVET system and establish measures of validation and alignment of education and training curricula with sector needs and requirements.
- Career opportunities could be studied in partnership with local industry starting in secondary school. Required competencies can be taught in vocational training systems if the equipment that is used is up-to-date by industry standard.
- Encourage the enterprises to implement programs improving labour productivity including insurance, recreation and introduction of competitive and transparent wages.

## **4. Export promotion**

- Evaluate the achievements of existing export promotion tools as well as propose new tools to put on equal footing Ukrainian exporters vis-à-vis European competitors (Export risk guarantee can cover a multitude of trade risks);
- Set-up Ukrainian business hubs in key countries in Europe (i.e. the UK, Germany, France, Italy);
- Continue High-level industrial dialogue with the EU as well as with single EU Members (i.e. Germany, France, Italy, Sweden, Baltic Countries), but also continue opening and

<sup>28</sup> <http://zakon5.rada.gov.ua/laws/show/1792-19>

expanding cooperation with other potential markets (i.e. Turkey, Korea, Japan, Israel, USA, Canada);

**Final goal:**

Enhance a standardised, evidence- and fact-based dialogue with the industrial sector, upon own initiative by the GoU to propagate new opportunities or in reply to any inquiry by private sector.

## 6 ANNEXES

### 6.1 Sector Profile

This study focusses specifically on Machinery, plant or laboratory heating equipment (HS position 8419) with the following sub-categories:

HS Product code	Description
841911	Heaters; instantaneous gas water heaters, for domestic or other purposes
841919	Heaters; instantaneous or storage water heaters, non-electric, other than instantaneous gas water heaters
841920	Sterilizers; for medical, surgical or laboratory use, not used for domestic purposes
841931	Dryers; for agricultural products, not used for domestic purposes
841932	Dryers; for wood, paper pulp, paper or paperboard, not used for domestic purposes
841939	Dryers; for products n.e.c. in heading no. 8419, not used for domestic purposes
841940	Distilling or rectifying plant; not used for domestic purposes
841950	Heat exchange units; not used for domestic purposes
841960	Machinery; for liquefying air or gas, not used for domestic purposes
841981	Machinery, plant and equipment; for making hot drinks, for cooking or heating food
841989	Machinery, plant and laboratory equipment; for treating materials by change of temperature, other than for making hot drinks or cooking or heating food
841990	Machinery, plant and laboratory equipment; parts of equipment for treating materials by a process involving a change of temperature

It is acknowledged that the Ukrainian economy suffered multiple setbacks over the past few years caused by multiple crises. This has led to drastic changes in foreign policy orientation that led to loss of traditional markets for many industrial goods. A previous study by Association4U identified several sectors that were underperforming under the DCFTA and hypothesised that other constraints were preventing them taking advantage of the new opportunities and if these constraints could be resolved, then it could unlock access to the EU market.

The machinery, plant or laboratory heating equipment sector was one of those products identified as underperforming with a current share in EU imports of machinery, plant or laboratory heating equipment, much lower than expected. Therefore, a consultation round with private sector stakeholders was initiated to identify these constraints and where appropriate to undertake further analysis.

### 6.2 Overview of Machinery, plant or laboratory heating equipment Production and Export in Ukraine

Machinery, plant or laboratory heating equipment production is part of the machine building industry, which includes several other sectors (individual branches of industry such as machinery and equipment) and subsectors. Thus, machinery, plant or laboratory heating equipment manufacturers depend on the faith of machine building industry, and it is worthwhile to analyse this sector.

## Output of machinery, plant or laboratory heating equipment in Ukraine in 2017<sup>29</sup>

Product name by the Nomenclature, unit	Output in 2017	% to 2016
Non-electric instantaneous or storage water heaters, pcs	462	126,6
Heat exchange units, pcs	12492	60,2
Producer gas or water gas generators; acetylene gas generators and the like; distilling or rectifying plant, pcs	57	79,2
Machinery, plant or laboratory equipment, whether or not electrically heated, for the treatment of materials by a process involving a change of temperature, n.e.c., pcs	1068	220,7
Non-domestic equipment for cooking or heating food (excluding non-electric tunnel ovens, non-electric bakery ovens, non-electric percolators), pcs	3560	115,5
Dryers for the treatment of agricultural products by a process involving a change in temperature, pcs	320	121,2

Manufacturing of general machinery and equipment as well as manufacture of electrical equipment are relatively large subsectors of industrial sector and machine building in Ukraine, representing 27% and 16% of machine building output. Subsectors differ in terms of their size, productivity and exposure to markets. Industrial companies are engaged in manufacturing of machinery and equipment for virtually all types of industrial activities.

The share of economic activity manufacture of machinery and equipment that includes machinery, plant or laboratory heating equipment dropped to 2.3% in 2016 from 2.9% in 2010.

*Volume of machinery and equipment n.e.c.<sup>30</sup> (Code of NACE<sup>31</sup>) in industrial products (goods, services) sold in 2012-2016 (bn. UAH/ %)\*\**

	2012		2013		2014		2015		2016	
	Value	in % to the total								
Industry	1 367,9	100,0	1 322,4	100,0	1 428,8	100,0	1 776,6	100,0	2 158,0	100,0
<b>Manufacture of machinery and equipment n.e.c.</b>	<b>37,6</b>	<b>2,8</b>	<b>34,8</b>	<b>2,6</b>	<b>33,5</b>	<b>2,3</b>	<b>42,0</b>	<b>2,4</b>	<b>50,1</b>	<b>2,3</b>

Performance of enterprises show the volume of sold machine building products in 2013 and 2015 as 8.7% and 6.5% of the total volume in industry accordingly. Index of industrial production in Ukraine for 2013 was 97.3% and for 2015 made 66.4% over 2010.

The average number of full-time employees dropped from 456 thousand in 2013 to 346 thousand in 2015 and made about 17% of the total number of employees in the industry.

In terms of Ukraine's production of machinery, plant or laboratory heating equipment, these also have been declining.

<sup>29</sup> Ukrstat

<sup>30</sup> n.e.c. stands for "not elsewhere classified"

<sup>31</sup> <https://siccode.com/en/pages/what-is-a-nace-code>

Total volume of manufacture of machinery and equipment n.e.c. (goods, services) January-February of 2018 amounted to UAH 7 519.1 m with 47.5% exported (UAH 3 569.9 m).

Based on Ukrstat statistics, total exports, as well as the exports of machine building fell between 2013 and 2016. Exports of the machines, equipment and mechanisms, electric and technical equipment amounted to \$ 4 277 m in 2017, an annual increase of 17.6 % but this remains 37.3 % lower than 2013 level (\$ 6 826.5 m). Exports of nuclear reactors, boilers, machines increased 10.7 % in 2017 to \$ 1 728.2 m but also remains 53.7 % lower than it was in 2013 (\$ 3 732,4 m). As a result, the share of machine building products in total exports has decreased from 11% to 9.9% during the last 5 years.

### ***Share of exports of industrial products from Ukraine in 2013-17 (%)***

<b>HS Commodity code and title</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Base metals and preparations thereof (XV.)	28,1	28,3	24,8	22,9	<b>23,4</b>
Machines, equipment and mechanisms, electric and technical equipment (XVI):	11,0	10,5	10,3	10,0	<b>9,9</b>
85 electric machines	5,0	5,0	5,2	5,7	5,9
84 nuclear reactors, boilers, machines	6,0	5,5	5,1	4,3	4,0

*(Source: Ukrstat)*

Ukrainian machine-building companies remain traditionally export-oriented with Russia and other CIS states being the key markets. However, a significant portion of export goes to the Central and Eastern Europe (CEE), China, India with a several players selling machines globally.

The large significance of the Russian market is largely due to the continuation of old economic ties. Due to good knowledge of trade partners, shared production standards and customised products, such long-standing trade relations usually are mutually advantageous and thus sensible to continue, although a diversification of exports is desirable as it reduces dependency on a single market and thus exposure to risks and shocks stemming from this key market.

## **6.3 Import Competition in Ukraine**

Ukraine manufacturers are under pressure from strong international competition. The total Ukraine's imports of machinery, plant or laboratory heating equipment increased by 13.7% in 2017 to \$ 139.3 m but remains 30.7 % lower than it was in 2013 (\$ 200.8 m).

Imports from the European countries increased by 4.3% in 2017 to \$ 101.8 m but remain 28.5 % lower than in 2013 (\$ 142.3 m). Imports from Asian countries increased by 4.3 % in 2017 to \$ 21.3 m but remain 6 % lower than in 2013 (\$ 22.7 m). Imports from America increased 2.9 times in 2017 to \$ 11.3 m and remain 47.1 % lower than in 2013 (\$ 21.4 m). Imports from the CIS countries increased 31.6 % in 2017 to \$ 4.8 m and remain 66.7% lower than in 2013 (\$ 14.4 m).

### ***Appendix 1. Growth of Ukraine's imports of machinery, plant or laboratory heating equipment (HS 8419) in 2013-17***

Ukraine imported about 73.1% of machinery, plant or laboratory heating equipment from Europe in 2017. The biggest exporters were Italy (27.5%), Germany (15.5%), Poland (7.5%), Czech Republic (3.7%), Switzerland (3.5%) and Austria (3.4%). 15.3% of machinery, plant or laboratory heating equipment Ukraine imported from Asia. The biggest exporter was China (7%) and Turkey

(5.7%). America exported 8.1% to Ukraine. The biggest exporter was the USA (4.4%). 3.4 % Ukraine imported from the CIS countries. The CIS main exporter was the Russian Federation (3 %).

#### ***Appendix 2. The main exporters of machinery, plant or laboratory heating equipment (HS 8419) to Ukraine in 2013-17***

Overall, the trade balance for machinery, plant or laboratory heating equipment in 2017 remains negative of \$ 93.5 m. that came from negative trade balance of \$ 73.5 m in 2016.

### **6.4 International markets for Ukrainian machinery, plant or laboratory heating equipment**

The total Ukraine's exports of machinery, plant or laboratory heating equipment decreased by 6.7% in 2017 to \$ 45.7 m compared to 2016 and remains 67.9 % lower than it was in 2013 (\$ 142.3 m). According to ITC<sup>32</sup>, in 2015 Ukraine's share of world exports of machinery, plant or laboratory heating equipment was 0.1% or € 34.6 m.

Exports to the CIS countries in 2017 dropped 2.3% to the previous year to \$ 40.1 m and remains 69.2 % lower than it was in 2013 (\$ 130.1 m). Exports to the European countries dropped 30.7 % in 2017 to \$ 3.5 m and was 17.3% lower than in 2013 (\$ 4.2 m). Exports to the Asian countries decreased by 28.4% in 2017 to \$ 1.6 m and was lower by 76.7% than in 2013 (\$ 6.9 m). In 2017 exports to African countries made \$ 0.1 m and decreased by 74.2% compared to the previous year and by 78.9% to 2013.

#### ***Appendix 3. Growth of Ukraine's exports of machinery, plant or laboratory heating equipment (HS 8419) in 2013-17***

In 2017, Ukraine exported 87.6 % of machinery, plant or laboratory heating equipment to the CIS countries. The CIS main importers were Russian Federation (59 %), Belarus (14.9%), Kazakhstan (5.3%). 12.4 % was exported to other countries (Europe 7.7%), (Asia 3.5 %), Africa (0.3%). Other importers were less than 3%.

#### ***Appendix 4. The main importers of machinery, plant or laboratory heating equipment (HS 8419) from Ukraine in 2013-17***

### **6.5 The EU market for machinery, plant or laboratory heating equipment**

Since 2008 to 2017, the EU imports of machinery, plant or laboratory heating equipment increased by 64.3%. EU machinery, plant or laboratory heating equipment sector is highly competitive and diversified.

The biggest highly performing exporters to the EU are Switzerland, Turkey and Philippines. According to ITC, in 2017, the EU imported 75.9% of machinery, plant or laboratory heating equipment from 6 biggest exporters China (26.61%), Switzerland (26.36%), USA (21.78%), Japan

<sup>32</sup> International Trade Centre, and there <http://www.trademap.org>

(3.55%), Philippines (3.06%) and Turkey (3.03%) in 2017. The share of Philippines before 2013 was less than 1% (in 2010 and 2011 it was 0.03%).

In this highly competitive market, Ukraine made only 0.08 % of the EU import in 2017. The biggest share of Ukraine's export of machinery, plant or laboratory heating equipment to the EU was 0.62% was in 2008. The smallest share of 0.05% and 0.09 were in 2009 and 2011.

#### ***Appendix 5. EU imports of machinery, plant or laboratory heating equipment from biggest exporters and Ukraine in 2008-17***

The Europe Sterilization Equipment market is divided based on geography into United Kingdom, France, Germany, Spain and Italy. Europe has the second largest market in the world by share. Factors such as rising geriatric population, increased incidence of hospital acquired infections and growing demand for sterilised equipment is expected to propel the market growth in the region. Some of the major players in the market include STERIS Corporation (U.S.), Getinge Group (Sweden), Advanced Sterilization Products (U.S.), 3M Company (U.S.), Belimed AG (Switzerland), Cantel Medical Corporation (U.S.), Anderson Products, Inc. (U.S.), Matachana Group (S.A.), MMM Group (Germany), and Sterigenics International, Inc. (U.S.). The Europe Sterilization Equipment Market was worth USD 1.22 billion in 2016 and estimated to be growing at a CAGR of 8.46%, to reach USD 1.83 billion by 2021.<sup>33</sup> Also the global market for sterilization equipment and disinfectants had reached a value of US\$5.13 billion in 2012. It is estimated that the market will register a cumulative average growth rate of 8.5% during 2013 to 2019 and reach US\$9.15 billion by 2019.<sup>34</sup>

## **7.1 Challenges for the Ukrainian Machinery, plant or laboratory heating equipment Producers**

The existing production and exports in Ukraine's machine-building industry appears to be currently dominated by products with a low level of processing and, more worrisome on a long-term outlook, with low value-added per capita.

The domestic market is attractive to most powerful producers of grain drying equipment. Currently, in Ukraine, in addition to the equipment of the largest world producers - the USA and the EU, there are dryers manufactured in China, Poland, Turkey.

Today, the Ukrainian market represents grain dryers produced by Grain Handler (USA), Bonfanti (Italy), Tornum (Sweden), Kepler Weber (Brazil), Ingenieria Mega (Argentina), Monsun Lachenmeier (Denmark), Strahl (Italy), Stela Laxhuber GMBH, Riela, Neuero (Germany), Karlovsky Machine Building Plant (Ukraine), and others. When choosing a grain dryer for the farm, various criteria are considered. But the main among them - performance, suitability and efficiency of the drying process.<sup>35</sup>

<sup>33</sup> <https://www.marketdataforecast.com/market-reports/europe-sterilization-equipment-market-3100/>

<sup>34</sup> <https://www.cnbc.com/2015/04/08/globe-newswire-sterilization-equipment-and-disinfectants-market-will-be-worth-us915-billion-by-2019-new-report-by-transparency-market.html>

<sup>35</sup> <http://propozitsiya.com/ua/ekonomika-procesiv-sushinnya-zerna>

Challenges are multiple, and companies hit by the crisis face it in all aspects but remain oriented towards the domestic market or towards the CIS.

## 8 APPENDICES

### 8.1 Appendix 1. Growth of Ukraine's imports of machinery, plant or laboratory heating equipment (HS position 8419) in 2013-17 (Ukrstat, Thousand \$)

Country	2013		2014		2015		2016		2017		% (+/-) to 2013
	Value	% (+/-) to 2012	Value	% (+/-) to 2013	Value	% (+/-) to 2014	Value	% (+/-) to 2015	Value	% (+/-) to 2016	
<b>TOTAL</b>	<b>200 850,4</b>	<b>-8,4</b>	<b>118 352,6</b>	<b>-41,1</b>	<b>78 391,4</b>	<b>-33,8</b>	<b>122 454,7</b>	<b>56,2</b>	<b>139 269,0</b>	<b>13,7</b>	<b>-30,7</b>
<b>I. CIS COUNTRIES</b>	<b>14 408,4</b>	<b>-26,9</b>	<b>5 134,7</b>	<b>-64,4</b>	<b>1 932,9</b>	<b>-62,4</b>	<b>3 644,2</b>	<b>88,5</b>	<b>4 797,2</b>	<b>31,6</b>	<b>-66,7</b>
Russian Federation	12 846,4	-34,6	4 547,5	-64,6	1 766,3	-61,2	3 244,1	83,7	4 181,4	28,9	-67,5
<b>II. OTHER COUNTRIES</b>	<b>186 441,9</b>	<b>-6,6</b>	<b>113 217,8</b>	<b>-39,3</b>	<b>76 458,5</b>	<b>-32,5</b>	<b>118 810,5</b>	<b>55,4</b>	<b>134 471,8</b>	<b>13,2</b>	<b>-27,9</b>
<b>EUROPE</b>	<b>142 347,7</b>	<b>-2,5</b>	<b>83 864,4</b>	<b>-41,1</b>	<b>62 728,2</b>	<b>-25,2</b>	<b>97 622,5</b>	<b>55,6</b>	<b>101 800,8</b>	<b>4,3</b>	<b>-28,5</b>
Austria	11 619,1	93001,6	4 639,6	-60,1	759,6	-83,6	4 379,5	476,5	4 671,3	6,7	-59,8
Bulgaria	2 780,2	40,3	1 186,5	-57,3	450,4	-62,0	4 277,9	849,8	398,6	-90,7	-85,7
United Kingdom	6 942,8	33,7	1 323,8	-80,9	332,0	-74,9	926,2	179,0	763,0	-17,6	-89,0
Denmark	4 756,2	72,0	1 808,9	-62,0	9 281,4	413,1	10 736,7	15,7	2 588,7	-75,9	-45,6
Estonia	16,0	-96,3	184,8	1055,5	20,9	-88,7	1 347,6	6338,2	400,0	-70,3	2401,6
Italia	30 831,0	9,8	22 478,2	-27,1	14 939,5	-33,5	27 431,4	83,6	37 932,0	38,3	23,0
Luxemburg	0,0	-100,0	1 695,7	+	0,0	-100,0	0,0	+	0,0	+	+
Netherlands	2 188,2	-92,2	582,8	-73,4	1 029,2	76,6	607,3	-41,0	2 378,6	291,7	8,7
Germany	28 864,3	-42,2	13 839,1	-52,1	14 888,7	7,6	13 911,6	-6,6	21 571,3	55,1	-25,3
Poland	14 822,7	28,1	9 813,9	-33,8	7 151,5	-27,1	9 498,0	32,8	10 414,9	9,7	-29,7
Slovakia	2 530,9	146,0	1 360,8	-46,2	512,2	-62,4	1 710,2	233,9	1 170,9	-31,5	-53,7
Hungary	4 305,5	308,0	379,4	-91,2	667,7	76,0	1 734,9	159,8	648,0	-62,7	-85,0
Finland	2 420,4	53,8	971,1	-59,9	1 209,2	24,5	220,5	-81,8	78,2	-64,5	-96,8
French	5 896,4	79,6	4 139,1	-29,8	1 988,2	-52,0	1 010,8	-49,2	3 672,2	263,3	-37,7
Czech Republic	6 457,8	-39,9	6 869,8	6,4	3 189,1	-53,6	12 810,8	301,7	5 175,3	-59,6	-19,9
Switzerland	7 980,9	37,0	4 665,3	-41,5	2 123,9	-54,5	1 986,7	-6,5	4 924,2	147,9	-38,3
Sweden	4 843,5	-21,5	4 389,9	-9,4	1 842,5	-58,0	1 688,5	-8,4	1 324,2	-21,6	-72,7
<b>ASIA</b>	<b>22 677,3</b>	<b>-12,9</b>	<b>13 684,4</b>	<b>-39,7</b>	<b>8 170,8</b>	<b>-40,3</b>	<b>17 306,3</b>	<b>111,8</b>	<b>21 321,9</b>	<b>23,2</b>	<b>-6,0</b>
Israel	610,7	168,8	218,7	-64,2	94,4	-56,9	463,0	390,6	2 157,1	365,9	253,2
China	13 069,7	3,7	8 968,8	-31,4	3 816,6	-57,4	11 140,0	191,9	9 683,3	-13,1	-25,9

Turkey	6 831,2	-36,6	3 815,0	-44,2	3 382,5	-11,3	4 259,1	25,9	7 940,5	86,4	16,2
<b>AMERICA</b>	<b>21 412,4</b>	<b>-22,5</b>	<b>15 669,0</b>	<b>-26,8</b>	<b>5 554,7</b>	<b>-64,5</b>	<b>3 874,2</b>	<b>-30,3</b>	<b>11 323,0</b>	<b>192,3</b>	<b>-47,1</b>
Argentina	1 407,9	-41,4	2 211,0	57,0	94,5	-95,7	0,0	-100,0	2 210,4	+	57,0
Brazil	314,5	-47,6	404,9	28,7	945,5	133,5	722,1	-23,6	2 335,6	223,4	642,5
USA	19 423,4	-19,0	12 835,7	-33,9	4 086,0	-68,2	2 822,5	-30,9	6 180,6	119,0	-68,2

## 8.2 Appendix 2. The main exporters of machinery, plant or laboratory heating equipment (HS position 8419) to Ukraine in 2013-17 (Ukrstat, Thousand \$)

Country	2013		2014		2015		2016		2017	
	Value	%	Value	%	Value	%	Value	%	Value	%
<b>TOTAL</b>	<b>200 850,4</b>	<b>100,0</b>	<b>118 352,6</b>	<b>100,0</b>	<b>78 391,4</b>	<b>100,0</b>	<b>122 454,7</b>	<b>100,0</b>	<b>139 269,0</b>	<b>100,0</b>
<b>I. CIS COUNTRIES</b>	<b>14 408,4</b>	<b>7,2</b>	<b>5 134,7</b>	<b>4,3</b>	<b>1 932,9</b>	<b>2,5</b>	<b>3 644,2</b>	<b>3,0</b>	<b>4 797,2</b>	<b>3,4</b>
Russian Federation	12 846,4	6,4	4 547,5	3,8	1 766,3	2,3	3 244,1	2,6	4 181,4	3,0
<b>II. OTHER COUNTRIES</b>	<b>186 441,9</b>	<b>92,8</b>	<b>113 217,8</b>	<b>95,7</b>	<b>76 458,5</b>	<b>97,5</b>	<b>118 810,5</b>	<b>97,0</b>	<b>134 471,8</b>	<b>96,6</b>
<b>EUROPE</b>	<b>142 347,7</b>	<b>70,9</b>	<b>83 864,4</b>	<b>70,9</b>	<b>62 728,2</b>	<b>80,0</b>	<b>97 622,5</b>	<b>79,7</b>	<b>101 800,8</b>	<b>73,1</b>
Austria	11 619,1	5,8	4 639,6	3,9	759,6	1,0	4 379,5	3,6	4 671,3	3,4
Bulgaria	2 780,2	1,4	1 186,5	1,0	450,4	0,6	4 277,9	3,5	398,6	0,3
United Kingdom	6 942,8	3,5	1 323,8	1,1	332,0	0,4	926,2	0,8	763,0	0,5
Denmark	4 756,2	2,4	1 808,9	1,5	9 281,4	11,8	10 736,7	8,8	2 588,7	1,9
Estonia	16,0	0,0	184,8	0,2	20,9	0,0	1 347,6	1,1	400,0	0,3
Italia	30 831,0	15,4	22 478,2	19,0	14 939,5	19,1	27 431,4	22,4	37 932,0	27,2
Luxemburg	0,0	0,0	1 695,7	1,4	0,0	0,0	0,0	0,0	0,0	0,0
Netherlands	2 188,2	1,1	582,8	0,5	1 029,2	1,3	607,3	0,5	2 378,6	1,7
Germany	28 864,3	14,4	13 839,1	11,7	14 888,7	19,0	13 911,6	11,4	21 571,3	15,5
Poland	14 822,7	7,4	9 813,9	8,3	7 151,5	9,1	9 498,0	7,8	10 414,9	7,5
Slovakia	2 530,9	1,3	1 360,8	1,1	512,2	0,7	1 710,2	1,4	1 170,9	0,8
Hungary	4 305,5	2,1	379,4	0,3	667,7	0,9	1 734,9	1,4	648,0	0,5
Finland	2 420,4	1,2	971,1	0,8	1 209,2	1,5	220,5	0,2	78,2	0,1
French	5 896,4	2,9	4 139,1	3,5	1 988,2	2,5	1 010,8	0,8	3 672,2	2,6
Czech Republic	6 457,8	3,2	6 869,8	5,8	3 189,1	4,1	12 810,8	10,5	5 175,3	3,7
Switzerland	7 980,9	4,0	4 665,3	3,9	2 123,9	2,7	1 986,7	1,6	4 924,2	3,5
Sweden	4 843,5	2,4	4 389,9	3,7	1 842,5	2,4	1 688,5	1,4	1 324,2	1,0
<b>ASIA</b>	<b>22 677,3</b>	<b>11,3</b>	<b>13 684,4</b>	<b>11,6</b>	<b>8 170,8</b>	<b>10,4</b>	<b>17 306,3</b>	<b>14,1</b>	<b>21 321,9</b>	<b>15,3</b>
Israel	610,7	0,3	218,7	0,2	94,4	0,1	463,0	0,4	2 157,1	1,5

China	13 069,7	6,5	8 968,8	7,6	3 816,6	4,9	11 140,0	9,1	9 683,3	7,0
Turkey	6 831,2	3,4	3 815,0	3,2	3 382,5	4,3	4 259,1	3,5	7 940,5	5,7
<b>AMERICA</b>	<b>21 412,4</b>	<b>10,7</b>	<b>15 669,0</b>	<b>13,2</b>	<b>5 554,7</b>	<b>7,1</b>	<b>3 874,2</b>	<b>3,2</b>	<b>11 323,0</b>	<b>8,1</b>
Argentina	1 407,9	0,7	2 211,0	1,9	94,5	0,1	0,0	0,0	2 210,4	1,6
Brazil	314,5	0,2	404,9	0,3	945,5	1,2	722,1	0,6	2 335,6	1,7
USA	19 423,4	9,7	12 835,7	10,8	4 086,0	5,2	2 822,5	2,3	6 180,6	4,4

### 8.3 Appendix 3. Growth of Ukraine's exports of machinery, plant or laboratory heating equipment (HS position 8419) in 2013-17 (Ukrstat, Thousand \$)

Country	2013 Value	% (+/-) to 2012	2014 Value	% (+/-) to 2013	2015 Value	% (+/-) to 2014	2016 Value	% (+/-) to 2015	2017 Value	% (+/-) to 2016	% (+/-) to 2013
<b>Total</b>	<b>142 361,8</b>	<b>-29,8</b>	<b>105 584,6</b>	<b>-25,8</b>	<b>38 406,1</b>	<b>-63,6</b>	<b>48 991,7</b>	<b>27,6</b>	<b>45 710,2</b>	<b>-6,7</b>	<b>-67,9</b>
<b>I. CIS COUNTRIES</b>	<b>130 108,4</b>	<b>-31,2</b>	<b>95 901,5</b>	<b>-26,3</b>	<b>31 384,3</b>	<b>-67,3</b>	<b>40 998,9</b>	<b>30,6</b>	<b>40 058,7</b>	<b>-2,3</b>	<b>-69,2</b>
Azerbaijan	1 941,5	-34,9	1 606,2	-17,3	1 711,8	6,6	1 277,0	-25,4	856,0	-33,0	-55,9
Belarus	20 740,0	94,5	9 554,9	-53,9	4 094,0	-57,2	4 634,1	13,2	6 808,4	46,9	-67,2
Kazakhstan	10 530,0	-9,3	3 580,9	-66,0	4 022,6	12,3	1 177,2	-70,7	2 424,2	105,9	-77,0
Kirghizstan	179,8	-91,2	594,3	230,5	9,5	-98,4	133,3	1301,3	578,5	334,0	221,7
Moldova	1 757,1	-16,2	712,2	-59,5	711,1	-0,1	607,6	-14,6	809,4	33,2	-53,9
Russian Federation	77 116,9	-31,7	53 234,3	-31,0	10 888,6	-79,5	32 892,3	202,1	26 990,8	-17,9	-65,0
Turkmenistan	1 130,9	-64,0	5 186,7	358,6	997,1	-80,8	21,9	-97,8	181,2	727,9	-84,0
Uzbekistan	16 302,0	-62,5	20 946,2	28,5	8 734,8	-58,3	74,5	-99,1	1 345,3	1705,0	-91,7
<b>II. OTHER COUNTRIES</b>	<b>12 253,4</b>	<b>-11,7</b>	<b>9 683,1</b>	<b>-21,0</b>	<b>7 021,7</b>	<b>-27,5</b>	<b>7 992,8</b>	<b>13,8</b>	<b>5 651,5</b>	<b>-29,3</b>	<b>-53,9</b>
<b>EUROPE</b>	<b>4 249,6</b>	<b>-7,8</b>	<b>5 778,1</b>	<b>36,0</b>	<b>2 889,0</b>	<b>-50,0</b>	<b>5 072,7</b>	<b>75,6</b>	<b>3 515,8</b>	<b>-30,7</b>	<b>-17,3</b>
Bulgaria	203,4	542,9	219,7	8,0	308,6	40,5	642,0	108,0	181,8	-71,7	-10,6
Estonia	71,5	-93,6	604,9	746,5	82,6	-86,3	527,5	538,3	293,6	-44,3	310,9
Lithuania	2 192,5	105,4	687,0	-68,7	857,5	24,8	1 881,7	119,4	954,9	-49,3	-56,4
Germany	157,1	86,1	1 045,6	565,5	559,7	-46,5	557,7	-0,3	176,6	-68,3	12,4
Poland	334,9	296,6	1 505,3	349,4	149,2	-90,1	100,1	-32,9	230,0	129,9	-31,3
Romania	193,0	228,0	96,6	-49,9	80,2	-17,0	816,7	917,7	125,9	-84,6	-34,7
Czech Republic	0,0	-100,0	35,4	+	32,7	-7,5	37,9	15,8	614,7	1522,6	+
<b>ASIA</b>	<b>6 908,9</b>	<b>93,8</b>	<b>3 152,9</b>	<b>-54,4</b>	<b>2 868,7</b>	<b>-9,0</b>	<b>2 248,3</b>	<b>-21,6</b>	<b>1 608,7</b>	<b>-28,4</b>	<b>-76,7</b>
Afghanistan	2 971,6	136,9	43,2	-98,5	774,1	1692,8	0,0	-100,0	0,0	+	-100,0

Georgia	551,5	81,6	592,6	7,5	335,5	-43,4	217,7	-35,1	495,7	127,7	-10,1
Iran	663,7	-55,7	610,3	-8,0	554,0	-9,2	45,7	-91,8	202,7	343,9	-69,5
Emirates	606,8	+	98,2	-83,8	111,6	13,7	686,8	515,1	2,0	-99,7	-99,7
Turkey	657,8	3913,6	451,1	-31,4	199,2	-55,8	629,9	216,2	118,9	-81,1	-81,9
<b>AFRICA</b>	<b>695,7</b>	<b>-70,0</b>	<b>528,7</b>	<b>-24,0</b>	<b>1 023,2</b>	<b>93,5</b>	<b>570,3</b>	<b>-44,3</b>	<b>147,1</b>	<b>-74,2</b>	<b>-78,9</b>
Nigeria	0,0	-100,0	1,2	+	518,3	44602,0	23,5	-95,5	0,4	-98,2	+

#### 8.4 Appendix 4. The share of importers of machinery, plant or laboratory heating equipment (HS position 8419) from Ukraine in 2013-17 (Ukrstat, Thousand \$)

	2013		2014		2015		2016		2017	
Country	Value	%	Value	%	Value	%	Value	%	Value	%
<b>Total</b>	<b>142 361,8</b>	<b>100,0</b>	<b>105 584,6</b>	<b>100,0</b>	<b>38 406,1</b>	<b>100,0</b>	<b>48 991,7</b>	<b>100,0</b>	<b>45 710,2</b>	<b>100,0</b>
<b>I. CIS COUNTRIES</b>	<b>130 108,4</b>	<b>91,4</b>	<b>95 901,5</b>	<b>90,8</b>	<b>31 384,3</b>	<b>81,7</b>	<b>40 998,9</b>	<b>83,7</b>	<b>40 058,7</b>	<b>87,6</b>
Azerbaijan	1 941,5	1,4	1 606,2	1,5	1 711,8	4,5	1 277,0	2,6	856,0	1,9
Belarus	20 740,0	14,6	9 554,9	9,0	4 094,0	10,7	4 634,1	9,5	6 808,4	14,9
Kazakhstan	10 530,0	7,4	3 580,9	3,4	4 022,6	10,5	1 177,2	2,4	2 424,2	5,3
Kirghizstan	179,8	0,1	594,3	0,6	9,5	0,0	133,3	0,3	578,5	1,3
Moldova	1 757,1	1,2	712,2	0,7	711,1	1,9	607,6	1,2	809,4	1,8
Russian Federation	77 116,9	54,2	53 234,3	50,4	10 888,6	28,4	32 892,3	67,1	26 990,8	59,0
Turkmenistan	1 130,9	0,8	5 186,7	4,9	997,1	2,6	21,9	0,0	181,2	0,4
Uzbekistan	16 302,0	11,5	20 946,2	19,8	8 734,8	22,7	74,5	0,2	1 345,3	2,9
<b>II. OTHER COUNTRIES</b>	<b>12 253,4</b>	<b>8,6</b>	<b>9 683,1</b>	<b>9,2</b>	<b>7 021,7</b>	<b>18,3</b>	<b>7 992,8</b>	<b>16,3</b>	<b>5 651,5</b>	<b>12,4</b>
<b>EUROPE</b>	<b>4 249,6</b>	<b>3,0</b>	<b>5 778,1</b>	<b>5,5</b>	<b>2 889,0</b>	<b>7,5</b>	<b>5 072,7</b>	<b>10,4</b>	<b>3 515,8</b>	<b>7,7</b>
Bulgaria	203,4	0,1	219,7	0,2	308,6	0,8	642,0	1,3	181,8	0,4
Estonia	71,5	0,1	604,9	0,6	82,6	0,2	527,5	1,1	293,6	0,6
Lithuania	2 192,5	1,5	687,0	0,7	857,5	2,2	1 881,7	3,8	954,9	2,1
Germany	157,1	0,1	1 045,6	1,0	559,7	1,5	557,7	1,1	176,6	0,4
Poland	334,9	0,2	1 505,3	1,4	149,2	0,4	100,1	0,2	230,0	0,5
Romania	193,0	0,1	96,6	0,1	80,2	0,2	816,7	1,7	125,9	0,3
Czech Republic	0,0	0,0	35,4	0,0	32,7	0,1	37,9	0,1	614,7	1,3
<b>ASIA</b>	<b>6 908,9</b>	<b>4,9</b>	<b>3 152,9</b>	<b>3,0</b>	<b>2 868,7</b>	<b>7,5</b>	<b>2 248,3</b>	<b>4,6</b>	<b>1 608,7</b>	<b>3,5</b>
Afghanistan	2 971,6	2,1	43,2	0,0	774,1	2,0	0,0	0,0	0,0	0,0
Georgia	551,5	0,4	592,6	0,6	335,5	0,9	217,7	0,4	495,7	1,1
Iran	663,7	0,5	610,3	0,6	554,0	1,4	45,7	0,1	202,7	0,4

Emirates	606,8	0,4	98,2	0,1	111,6	0,3	686,8	1,4	2,0	0,0
Turkey	657,8	0,5	451,1	0,4	199,2	0,5	629,9	1,3	118,9	0,3
<b>AFRICA</b>	<b>695,7</b>	<b>0,5</b>	<b>528,7</b>	<b>0,5</b>	<b>1 023,2</b>	<b>2,7</b>	<b>570,3</b>	<b>1,2</b>	<b>147,1</b>	<b>0,3</b>
Nigeria	0,0	0,0	1,2	0,0	518,3	1,3	23,5	0,0	0,4	0,0

### 8.5 Appendix 5. EU imports of machinery, plant or laboratory heating equipment (HS position 8419) from biggest exporters and Ukraine in 2008-17

Eurostat data	EU import, Euro thousand									
	Jan.-Dec. 2008		Jan.-Dec. 2009		Jan.-Dec. 2010		Jan.-Dec. 2011		Jan.-Dec. 2012	
PARTNER/FLOW	Value	%	Value	%	Value	%	Value	%	Value	%
<b>EU28_EXTRA (total)</b>	<b>1 729 066</b>	<b>100,00</b>	<b>1 636 197</b>	<b>100,00</b>	<b>1 717 772</b>	<b>100,00</b>	<b>1 732 145</b>	<b>100,00</b>	<b>1 888 869</b>	<b>100,00</b>
China	290 228	16,79	316 130	19,32	330 965	19,27	408 428	23,58	459 717	24,34
Switzerland	579 802	33,53	450 995	27,56	467 068	27,19	526 657	30,40	544 547	28,83
United states	440 711	25,49	373 069	22,80	426 449	24,83	394 762	22,79	424 189	22,46
Japan	52 331	3,03	70 596	4,31	74 329	4,33	58 911	3,40	62 929	3,33
Philippines	2 663	0,15	799	0,05	469	0,03	520	0,03	17 475	0,93
Turkey	60 831	3,52	58 862	3,60	53 904	3,14	61 181	3,53	68 118	3,61
India	50 684	2,93	44 213	2,70	27 463	1,60	23 910	1,38	30 913	1,64
Republic of Korea	36 696	2,12	95 389	5,83	54 664	3,18	37 388	2,16	44 304	2,35
Canada	22 215	1,28	22 085	1,35	31 210	1,82	26 370	1,52	33 539	1,78
Ukraine	10 758	0,62	855	0,05	2 075	0,12	1 530	0,09	2 884	0,15

### Continued EU import of machinery, plant or laboratory heating equipment (HS position 8419) from biggest exporters and Ukraine in 2008-17

Eurostat data	EU import, Euro thousand									
	Jan.-Dec. 2013		Jan.-Dec. 2014		Jan.-Dec. 2015		Jan.-Dec. 2016		Jan.-Dec. 2017	
PARTNER/FLOW	Value	%	Value	%	Value	%	Value	%	Value	%
<b>EU28_EXTRA (total)</b>	<b>1 975 763</b>	<b>100,00</b>	<b>2 165 455</b>	<b>100,00</b>	<b>2 493 365</b>	<b>100,00</b>	<b>2 582 238</b>	<b>100,00</b>	<b>2 840 755</b>	<b>100,00</b>
China	459 408	23,25	507 555	23,44	601 170	24,11	622 033	24,09	755 905	26,61
Switzerland	574 206	29,06	660 001	30,48	711 102	28,52	738 433	28,60	748 891	26,36

United states	425 046	21,51	480 951	22,21	579 293	23,23	620 133	24,02	618 669	21,78
Japan	67 836	3,43	77 828	3,59	68 139	2,73	84 963	3,29	100 744	3,55
Philippines	44 064	2,23	48 418	2,24	77 527	3,11	61 078	2,37	86 920	3,06
Turkey	69 092	3,50	67 019	3,09	74 590	2,99	74 035	2,87	86 192	3,03
India	45 785	2,32	44 676	2,06	63 100	2,53	54 059	2,09	61 860	2,18
Republic of Korea	42 549	2,15	37 641	1,74	55 131	2,21	48 697	1,89	55 299	1,95
Canada	27 512	1,39	27 833	1,29	23 750	0,95	27 066	1,05	39 067	1,38
Ukraine	2 793	0,14	2 932	0,14	2 706	0,11	3 221	0,12	2 387	0,08

## 8.6 Appendix 6. Underperformance of taps, cocks, valve sector in Ukraine in 2008-17

Eurostat data

<b>Euro</b>	Jan.-Dec. 2008		Jan.-Dec. 2009		Jan.-Dec. 2010		Jan.-Dec. 2011		Jan.-Dec. 2012		Jan.-Dec. 2013		Jan.-Dec. 2014		Jan.-Dec. 2015
MACHINERY, PLANT OR LABORATORY EQUIPMENT WHETHER OR NOT ELECTRICALLY HEATED; PARTS THEREOF	IMPORT	%	IMPORT												
CHINA (PEOPLE'S REPUBLIC OF)	290,228,000	16.79	316,130,197	19.32	330,965,264	19.27	408,427,938	23.58	459,717,044	24.34	459,408,016	23.25	507,555,164	23.44	601,170,000
SWITZERLAND (incl. LI->1994)	579,801,699	33.53	450,995,436	27.56	467,067,970	27.19	526,656,823	30.40	544,546,658	28.83	574,205,525	29.06	660,000,930	30.48	711,100,000
UNITED STATES	440,710,581	25.49	373,068,993	22.80	426,449,364	24.83	394,762,197	22.79	424,188,586	22.46	425,045,626	21.51	480,950,710	22.21	579,290,000
JAPAN	52,330,679	3.03	70,595,875	4.31	74,329,245	4.33	58,911,270	3.40	62,928,616	3.33	67,835,659	3.43	77,827,726	3.59	68,130,000
PHILIPPINES	2,663,070	0.15	798,980	0.05	469,004	0.03	519,926	0.03	17,475,154	0.93	44,063,885	2.23	48,417,609	2.24	77,520,000
TURKEY	60,831,226	3.52	58,862,355	3.60	53,904,430	3.14	61,181,132	3.53	68,117,531	3.61	69,092,174	3.50	67,018,633	3.09	74,580,000
INDIA	50,684,116	2.93	44,213,447	2.70	27,462,678	1.60	23,910,078	1.38	30,912,609	1.64	45,785,023	2.32	44,676,158	2.06	63,090,000
KOREA, REPUBLIC OF (SOUTH KOREA)	36,695,668	2.12	95,388,858	5.83	54,664,287	3.18	37,387,731	2.16	44,303,865	2.35	42,549,455	2.15	37,640,971	1.74	55,130,000
CANADA	22,214,603	1.28	22,084,886	1.35	31,210,083	1.82	26,369,558	1.52	33,539,484	1.78	27,511,979	1.39	27,833,363	1.29	23,740,000
UKRAINE	10,758,464	0.62	855,240	0.05	2,074,833	0.12	1,530,198	0.09	2,884,330	0.15	2,792,590	0.14	2,932,139	0.14	2,700,000
EU28_EXTRA	1,729,066,276	100.00	1,636,196,651	100.00	#####	100.00	1,732,144,944	100.00	1,888,868,764	100.00	1,975,762,873	100.00	2,165,455,187	100.00	2,493,360,000
ITC data															
<b>Euro thousand</b>	Jan.-Dec. 2008		Jan.-Dec. 2009		Jan.-Dec. 2010		Jan.-Dec. 2011		Jan.-Dec. 2012		Jan.-Dec. 2013		Jan.-Dec. 2014		Jan.-Dec. 2015
PRODUCT	EXPORT	$I_i$	EXPORT												
CHINA (PEOPLE'S REPUBLIC OF)	1,513,482	2.99	1,614,000	2.84	1,743,784	2.67	1,934,081	3.24	2,496,011	2.88	2,500,277	2.81	2,879,231	2.53	4,220,000

SWITZERLAND (incl. LI->1994)	1,148,280	7.88	772,588	8.45	798,352	8.23	919,901	8.78	929,115	9.15	873,639	10.04	966,460	9.80	1,07
UNITED STATES	2,574,543	2.67	2,193,950	2.46	2,649,190	2.27	2,721,469	2.22	3,365,566	1.97	3,214,107	2.02	3,396,891	2.03	3,81
JAPAN	1,520,730	0.54	1,667,515	0.61	1,703,197	0.61	1,747,335	0.52	1,561,833	0.63	1,352,039	0.77	1,293,963	0.86	1,42
PHILIPPINES	7,369	5.64	8,564	1.35	30,865	0.21	42,287	0.19	34,329	7.95	41,583	16.18	144,599	4.80	5
TURKEY	98,748	9.61	83,409	10.22	113,287	6.70	114,647	8.18	136,577	7.79	140,514	7.51	140,537	6.84	16
INDIA	292,165	2.71	414,121	1.55	587,673	0.66	365,086	1.00	342,072	1.41	433,938	1.61	389,716	1.64	47
KOREA, REPUBLIC OF (SOUTH KOREA)	1,372,247	0.42	1,377,327	1.00	1,133,061	0.68	1,344,286	0.43	1,954,177	0.35	1,458,226	0.45	1,583,291	0.34	2,08
CANADA	564,221	0.61	432,608	0.74	509,671	0.86	558,790	0.72	653,699	0.80	653,110	0.64	619,569	0.64	66
UKRAINE	98,172	1.71	65,280	0.19	44,367	0.66	88,947	0.26	158,649	0.28	107,931	0.40	79,432	0.53	3
<b>World Imports of product</b>	<b>26,983,434</b>	<b>1.00</b>	<b>23,698,367</b>	<b>1.00</b>	<b>24,173,947</b>	<b>1.00</b>	<b>26,564,277</b>	<b>1.00</b>	<b>29,504,375</b>	<b>1.00</b>	<b>30,169,271</b>	<b>1.00</b>	<b>31,069,509</b>	<b>1.00</b>	<b>34,99</b>

