



MINISTRY  
OF ECONOMIC DEVELOPMENT,  
TRADE AND AGRICULTURE OF UKRAINE

STUDY

# EXPORT STRATEGY FOR AIRCRAFT REPAIR AND MAINTENANCE SECTOR



2019-2023



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## ACRONYMS AND DEFINITIONS

AAUCA	Association «Airports of Ukraine» of Civil Aviation
AHMS	Aircraft Health Monitoring System
AHM	Aircraft Heavy Maintenance
AI	Artificial Intelligence
AMC & GM	Acceptable Means of Compliance (AMC) and Guidance Material (GM)
AMO	Aviation Maintenance Organisation
APU	Accessory Power Unit
ARP (ARE)	Aircraft Repair Plant (Aircraft Repair Enterprise)
Aviation Rules	Aviation Rules of Ukraine «General Rules of Flights in the Airspace of Ukraine», approved by the Order of the Aviation Authority No. 66/73 dated 6 February 2017
BSAC	Bila Tserkva State Aviation Centre
CAA	Common Aviation Area
CAGR	Compound Annual Growth Rate
CAMO	Continuing Airworthiness Management Organization
CAPA	Centre for Aviation, launched in 1990, with a mission to make a strategic difference in aviation knowledge, delivered with the highest levels of intellectual integrity
C-check	The set of extensive maintenance works on aircraft that is performed every 20-24 months in hangar
CS	Certification Specification
D-check	The most comprehensive check for an airplane that occurs every 6-10 years
DACP (ДАЗ)	Dnipro Aviation Components Plant
DAP	Dnipro Aggregate Plant
EASA	European Air Safety Association
EFTA	European Free Trade Association
EMEA	Europe, the Middle East and Africa
ENP	European Neighbourhood Policy
ESU	Export Strategy of Ukraine: Strategic Trade Development Roadmap for 2017-2021 and Action Plan
FAA	Federal Aviation Administration of USA
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICF	ICF International, Inc. – Global consulting and technology services company
IoT	Internet of Things
ITC	International Trade Center, Geneva
JAA	Joint Aviation Authority
KSAMC	Kharkiv State Aircraft Manufacturing Company
LLP	Life Limited Parts
LMV	Line Maintenance Visit
LRU	Line-Replacable Unit
ML	Machine Learning
MEDT	Ministry of Economic Development, Trade and Agriculture of Ukraine
MES	Ministry of Education and Science of Ukraine

MPD	Maintenance Planning Document
MRO	Maintenance, Repair and Overhaul
MRBR	Maintenance Review Board Report
MTOA	Maintenance Training Organisations
OEM	Original Equipment Manufacturer
SAAU	State Aviation Administration of Ukraine
SC	Supply Chain
SE FED	Kharkiv machine-building plant FED
SEZ	Special Economic Zone
SECS	State Export Control Service of Ukraine
SCS	State Custom Service of Ukraine
SFS	State Fiscal Service of Ukraine
SOEAI	State Office of coordination of European and Euro-Atlantic Integration of Ukraine
Stakeholder	Organisation that is interested in results of someone's activity
SE Antonov	State Enterprise «Antonov»
SV	Shop visit (Engine Shop Visit)
UIA	Ukraine International Airlines
UkSATSE	Ukrainian State Air Traffic Services Enterprise
Ukroboronprom	State Concern «Ukroboronprom» is an association of multi-product enterprises (conglomerate or concern) in various sectors of the defense industry of Ukraine
USM	Used serviceable material
VAC	Value Added Chain

## ACKNOWLEDGEMENTS

Export Strategy for Aircraft Repair and Maintenance Sector (hereinafter this document is referred to as the «Strategy» and the Aircraft Repair and Maintenance Sector – as the «MRO sector» was initiated by the Ministry of Economic Development, Trade and Agriculture of Ukraine in the framework of «Export Strategy of Ukraine: Strategic Trade Development Roadmap for 2017–2021 and Action Plan» implementation, elaborated with the support of the International Trade Centre and Non-Governmental Union «Foundation for Support of Reforms in Ukraine» and with financial contribution from the German government through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The Strategy was developed by the international team comprising of the experts listed below. Positions, conclusions and/or recommendations laid down in this Strategy may not conform wholly or partially with the official position of an organization, which representatives contributed to the text of the Strategy, as well as the position of the International Trade Centre and Non-Governmental Union «Foundation for Support of Reforms in Ukraine» and German government through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

This Strategy was developed by the international group of experts as follows:

Name	Position	Organisation
<b>Alberto Pacheto</b>	Team leader	International Trade Center
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<b>Chris Markou</b>	International consultant	International Air Transport Association
<b>Iryna Khomenko</b>	International consultant	International Air Transport Association
<b>Olesya Zaluska</b>	Adviser to the Minister	Ministry of Economic Development and Trade of Ukraine

# EXECUTIVE SUMMARY

Ukraine belongs to the selective club of countries that have managed to develop an aviation industry. This refers to manufacturing aircraft, aircraft engineering, but also key aviation components such as aircraft engines, and the provision of aftermarket services – maintenance, repair and overhaul (MRO or MRO Sector depending on the context).

This sector strategy is a joint response to orient Ukraine's trade development, to tackle constraints, and to embrace opportunities for export development in the MRO sector in a practical manner.

Under an overall vision of «Exports for sustainable development and success on global markets», the sector strategy elaborates three strategic objectives:

## **1. To harmonize the Ukrainian MRO regulations with EU ones and to adapt existing trade regulations to the needs of the sector.**

This strategic objective aims at adapting the set of Ukrainian regulations affecting the MRO sector to ensure that they do not interfere with the long term development of the sector. Relatively shallow national market restricts the opportunities for local MRO firms to grow and exploit economies of scale. Hence, the Ukrainian MRO sector needs to be outward-looking to grow. Overseas growth opportunities will only be seized with adequate regulations. Regulatory harmonization with the EU is a matter of life or death for the sector.

The Ukrainian aviation regulations should lean towards synchronization and adaptation with the aviation regulations of the EU. The survival of the MRO sector in Ukraine hinges on obtaining EASA certification (compliance and suitability of aircrafts, engines, airscrews and components) for the local operators. Removing barriers and unnecessary burdens or regulations on MRO operators and potential investors is an additional priority while ensuring that good governance and convergence to EU regulations prevail. The way forward involves adapting existing trade regulations by cutting red-tape and reducing bureaucracy. Trade regulations affecting the MRO should be more client-oriented. This means allowing MRO firms to fast-track the clearance of spare parts at customs and relaxing export control area regulations on goods and services of dual-use used for MRO activities for civil aircraft.

## **2. To develop a strong reputation for affordable high-quality MRO services and a conducive business environment.**

An outstanding business environment eases the effort for entrepreneurs and investors, boosts firms' competitiveness, and lowers the cost of doing business in the country. A combination of home-grown capacity enhancements with selective knowledge and capacity-enhancing foreign investments is proposed as the way forward. This should be supported by further strengthening the business environment and a strong marketing and communication effort to reach out to potential customers.

This strategic objective directly aims at attracting selective investments in the short term while strengthening the competitiveness of the aviation business environment in short to medium term. A key component of this objective consists of ensuring that foreign investments stimulate innovation, economies of scale and an improved business environment. In the long run, fostering collaborations on innovation between enterprises and educational institutions is a key element of this strategic objective. A strong branding initiative and marketing effort will support this objective.

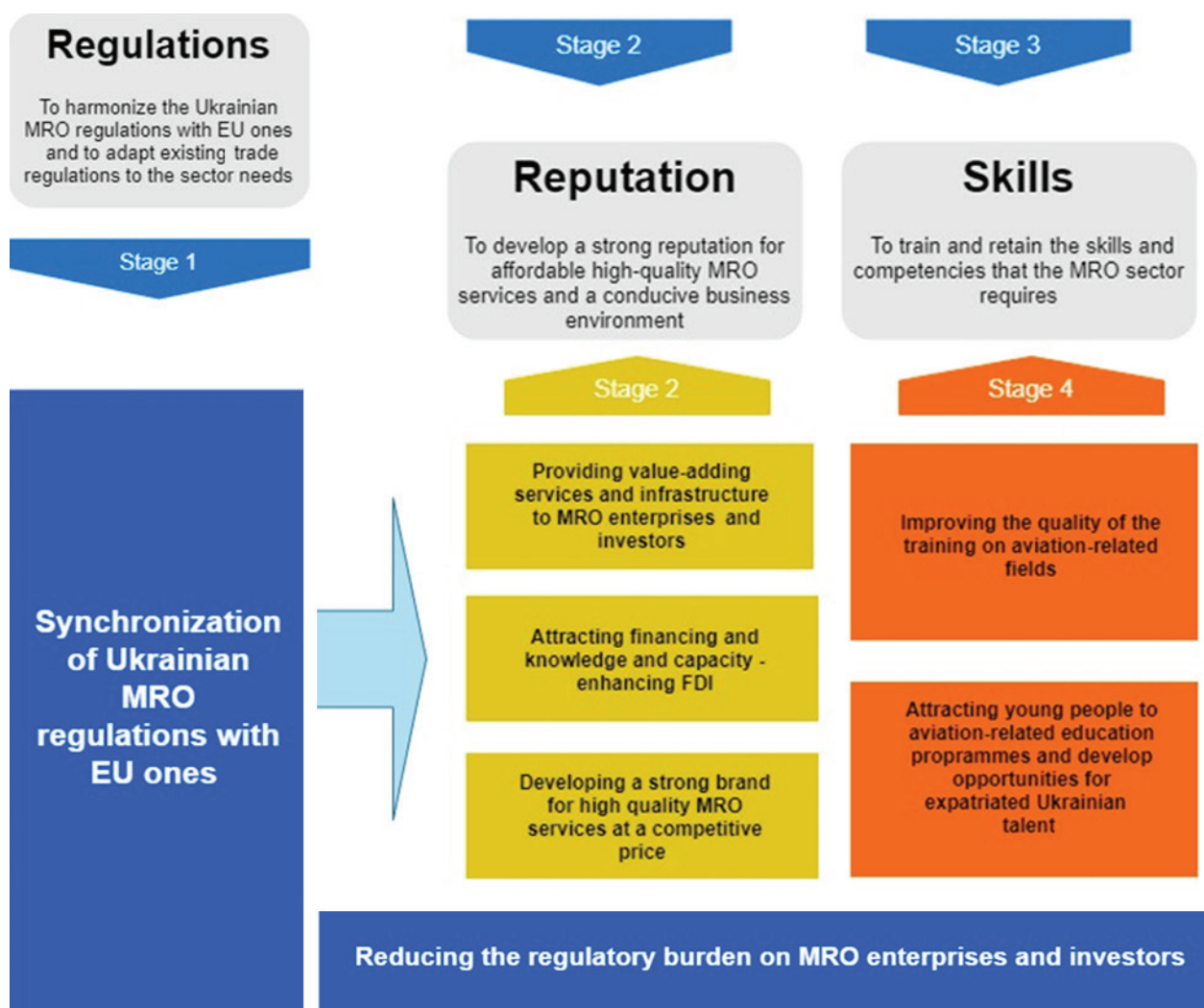
## **3. To train and retain the skills and competencies that the MRO sector requires.**

This strategic objective targets skills development and «brain drain» in the MRO sector. In the short run, the objective is to increase the number of young people trained in the aviation-related sector and to improve the quality of their training. Ensuring the right opportunities for these graduates in the local MRO sector is what this objective boils down to. In the longer run, the aim is to bring back some of the MRO and aviation experts currently working overseas.

Ensuring inclusive economic growth is important so that all segments of the population benefit from trade. This consists of promoting sustainable socio-economic development through more intensive and efficient use of the available human resources. This objective focuses on creating job opportunities for better-trained youth.

Figure 1 below outlines the relation between the strategic and operational objectives. It also provides an overview of the sequencing of strategic actions. The first operational objective in Stage 1 is supposed to be implemented first and foremost. The remaining ones can happen in a more or less simultaneous manner.

Figure 1: Logical framework of the roadmap



Source: ITC and Strategy stakeholder consultations, 2018

Through extensive consultations with public and private sector operators, this sector strategy provides a systematic analysis of constraints that have impeded the sector from making progress on the objectives outlined in Figure 1. The Plan of Action offers a concrete plan of action to overcome them.

#### Market dimension

The total fleet is estimated to approach 46,900 aircraft within the next decade. The Middle East and Asia Pacific based aircraft will be growing at numbers of over 5%; however, Europe will show a cumulative annual growth rate (CAGR) of 2.5%. Beyond the natural opportunities on line maintenance, there is a lot of potential in the areas of Aircraft Heavy Maintenance and modifications.

## Implementation of the roadmap

This sector strategy is part of a comprehensive ESU. It is designed to identify constraints and opportunities to trade development as well as priorities that the country should focus on in order to develop the MRO sector. Simultaneously, it presents a plan of action to achieve results that are fundamental to further export competitiveness and development.

The roadmap caters for the necessary governance structures to ensure the correct implementation of the plan of action over the next five years. To obtain early results, this plan of action details a series of activities to be implemented in the short- to medium-term timeframe. The effectiveness of implementation is likely to be contingent on the sector's ability to align the efforts of the various institutions – public, private, and civil society – with the priorities identified. The public-private dialogue platform established to design the Strategy should play a leading role in its implementation. It should be strengthened further to enable the successful management, monitoring, and measurement of the implementation phase.

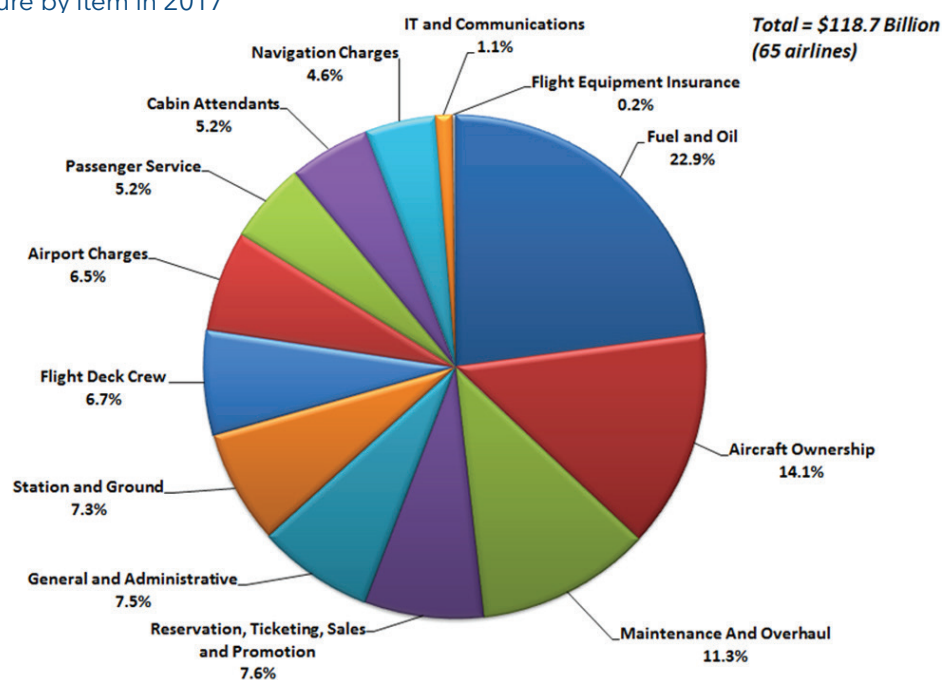
## AVIATION MAINTENANCE, REPAIR AND OVERHAUL IN UKRAINE

### ◇ Global perspective

According to IATA's Economic Performance of the Airline Industry (June 2018), in 2017, airlines generated \$754 billion revenue while incurring \$697 billion of expenses. During the same year (2017) and utilizing detailed data from 65 airlines globally (representing about 17% of the total airline industry expenses as shown in Figure 2), airlines spent about 11.3% for aircraft maintenance related activities.

An additional 14.1% of costs are attributed to Aircraft Ownership (financing and leasing), a number that includes significant maintenance-related expenses. An estimated 25-35% of aircraft ownership costs can be related to maintenance activities; work that has to be carried out for aircraft in transition between operators. Therefore, about 15% of the total airline industry costs are expensed in aircraft maintenance work (MRO; Maintenance, Repair and Overhaul).

Figure 2: Airline expenditure by item in 2017

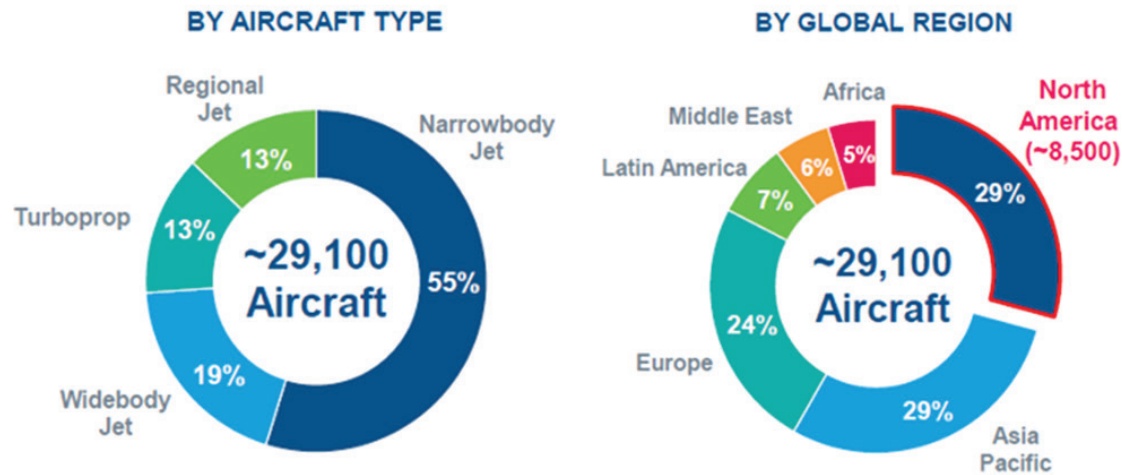


Source:  
ICF Analysis>  
CAPA 2017  
constant USD.  
Provided by IATA.

The airline work is carried out by about 29,000 aircraft (from the large turboprop aircraft to the large commercial jetliners; excluding the former USSR produced aircraft that still operate today). About 24% of these aircraft are flying in Europe (including the CIS countries). Data and information on the current aircraft fleet manufactured in the USSR and its related MRO expenses are very limited and, in general, may be unreliable but Figure 3 provides a good estimation based on the available data.



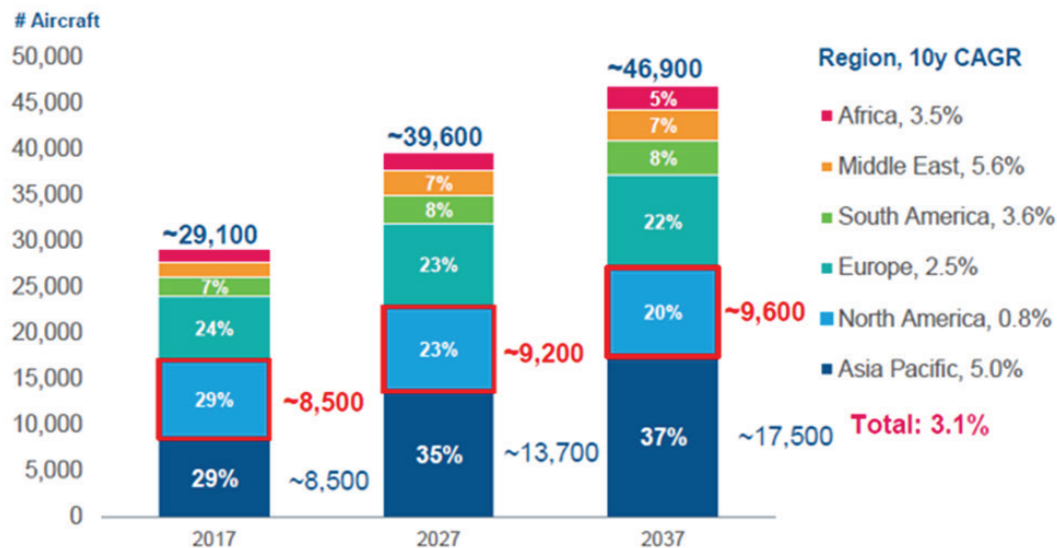
Figure 3: Fleet by region and type of aircraft



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

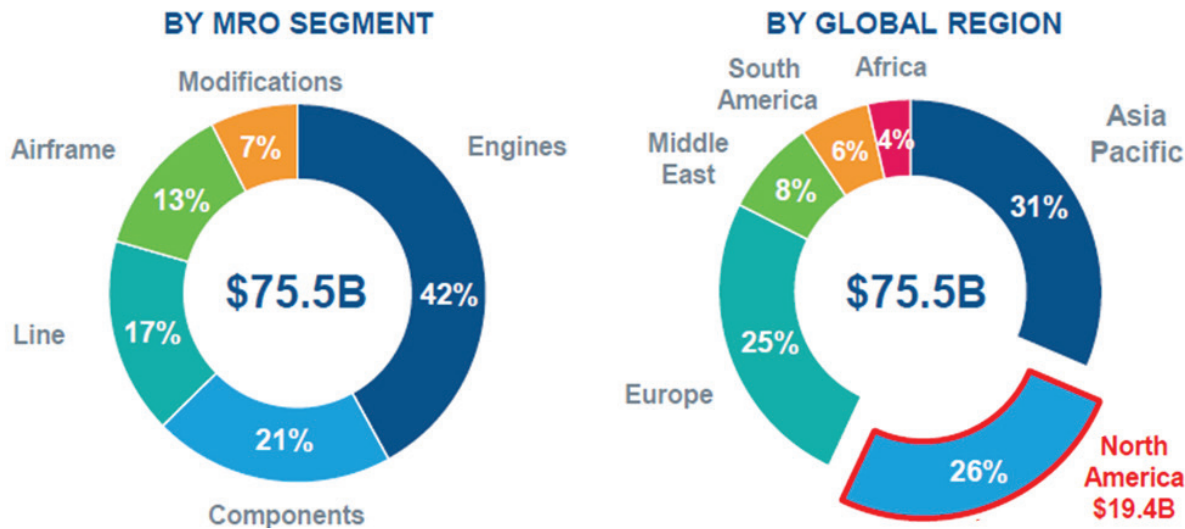
The total fleet is estimated to approach 46,900 aircraft within the next decade, as shown in Figure 4. The Middle East and Asia Pacific based aircraft will be growing at numbers of over 5%; however, Europe will show a cumulative annual growth rate (CAGR) of 2.5%.

Figure 4: Number of aircraft by region in 2017 and beyond (projections)



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

Figure 5: MRO by region



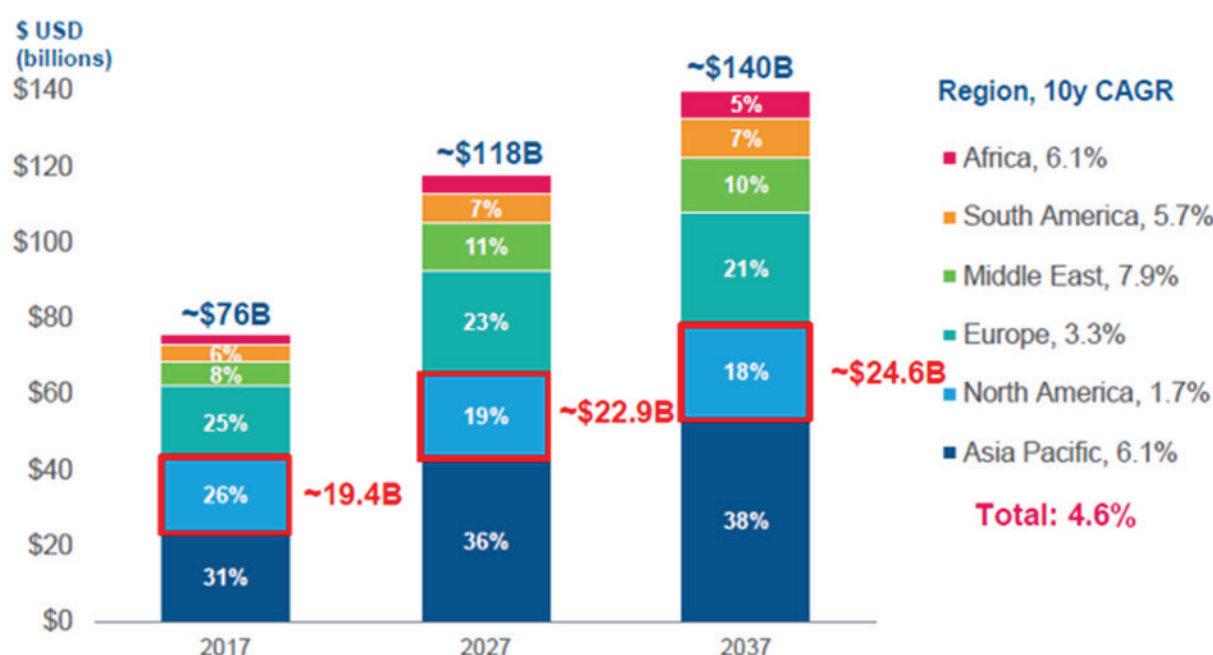
Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

ICF Analysis with data from CAPA shows that the total airline MRO spent for 2017 was about \$75.5 billion. This number represents about 11% of the total airline expenses; in line with the earlier shown pie chart.

It should be noted that the two donut charts shown in Figure 5, address only the direct maintenance costs and exclude overhead costs such as Engineering, Quality, Material Management and other related indirect maintenance costs. Adding these costs will mean that the related total MRO expenses are about \$100 billion annually.

The MRO European market (includes the CIS countries) represent 25% of the total market; a significantly large market.

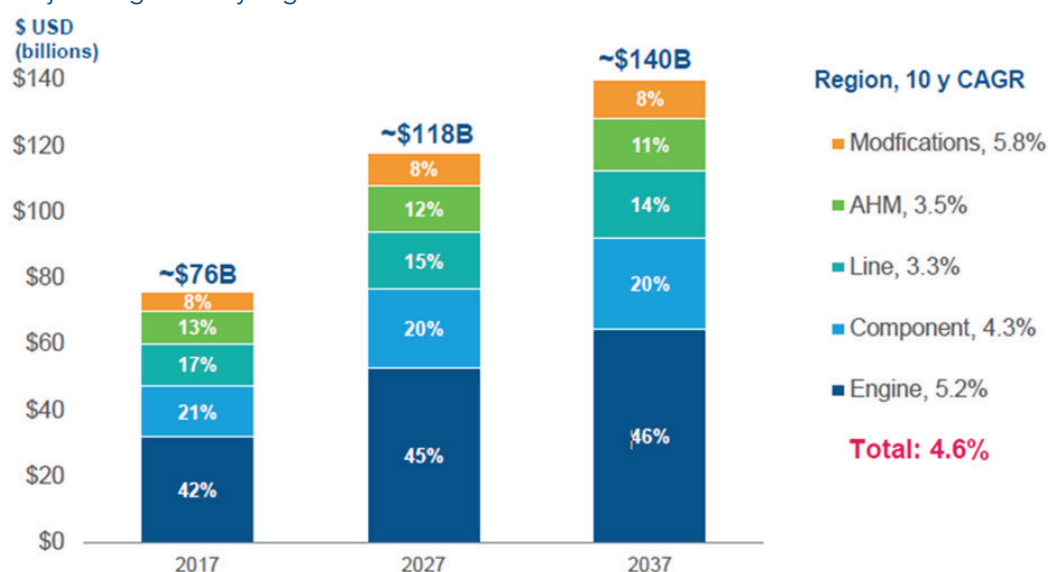
Figure 6: Projected growth by region



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

The CAGR for Europe is estimated to be about 3.3%. It is assumed that Ukrainian based MROs will have primary access to this market, mainly, due to its proximity (Figure 6). In a further and more detailed analysis, considerations of established relationships with other parts of the world should be also considered.

Figure 7: Projected growth by segment



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

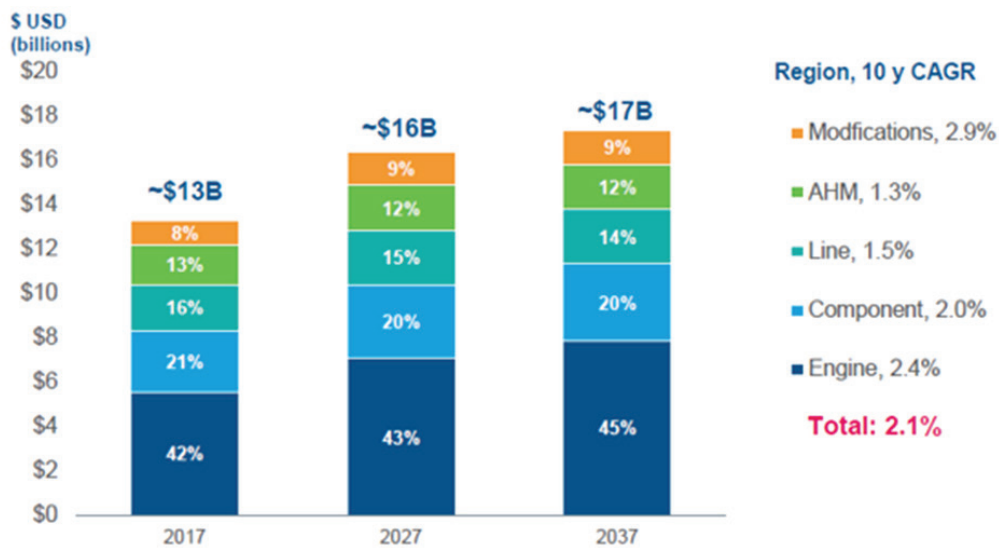
The MRO market is broken into 5 large segments (Figure 7):

1. Engine maintenance representing about 42% of the market and expected to grow at numbers above the average MRO growth. The Engine Maintenance market is dominated by the Engine Original Equipment Manufacturers (OEMs) and the large airlines that have Engine Overhaul shops. Significant capital investment is required to get into this business that is also characterized by roughly 15% labor content into the total cost. Engine OEMs keep for themselves certain Intellectual Property required for engine repairs, making entry into such market highly challenging (unless there is some type of cooperation/partnership/licensing agreement with the Engine OEM).
2. The Component Repair market is 20%, and it is estimated to grow at about the same rate as the total MRO market. It is a fragmented market that may provide an opportunity for engagement based on specific component families under consideration (e.g. landing gear, APU, Thrust Reversers, Mechanical Components, Avionics, Composite Materials etc.). OEMs in this segment are trying to employ the Engine OEM model, i.e. protecting the market as much as they can with exclusionary type agreements, licenses etc. At the same time, the Airframe Manufacturers and especially Boeing are trying to acquire component OEMs to get access to the lucrative component maintenance business. Component OEMs are defending their MRO market by merging with each other and with larger OEM conglomerates (e.g. United Technologies). Component Maintenance is roughly 50-50 between labor and material costs. Depending on the nature of the components under evaluation, significant cleaning, testing and other high-tech equipment and tooling may be required. To materialize such capabilities, a detailed analysis of capital investment requirements is needed on a case by case basis. Usually, components with high rates of removals (e.g. wheels, tires and brakes) represent opportunities for MRO work.
3. The Line Maintenance market is quite localized; it needs to be carried away at stations (airports) that the aircraft flies to. As the Ukrainian Aviation market keeps growing, more aircraft will be touching Ukrainian airports opening opportunities for Line Maintenance. Line Maintenance is labor intensive; mechanics are needed to inspect, do functional checks, troubleshoot and remove and repair various components (LRUs; Line Replaceable Units that are sent to Component shops for repair).
4. The Aircraft Heavy Maintenance market is labor-intensive as many aircraft parts have to be removed, structures need to be opened up and inspected while significant rectification has to be done once findings are recorded. As the aircraft becomes older, the amount of inspections, findings and rectifications is expected to grow; this imposes certain challenges for MROs that have to adapt to unknown and unexpected work. Heavy Maintenance is a complex business that requires very good planning skills, flexibility and labor adaptability to become and remain competitive. Low labor cost countries have managed to attract Heavy Maintenance work that, in general, provides well-paid jobs in these countries by offering such competitive advantage. Additionally, integration of planning and monitoring tools and processes provides advantages to MROs that can capitalize on such skills. Heavy Maintenance requires appropriate airport facilities with hangars and easy access for aircraft. Additionally, it requires efficient customs support; it is crucial to meet reputation by meeting promised turn times for the aircraft. Customs clearance times are critical; being unable to clear customs quickly will result in monetary penalties and loss of reputation.
5. The Modifications market is many times linked to the Heavy Maintenance. As the aircraft is out of service undergoing a long heavy check, the operator will ask for specific modifications to be implemented. These modifications include a wide range of services ranging from cabin replacements (including In-Flight Entertainment Systems and Internet access) to new avionics to painting. Special considerations have to be deliberated before certain types of work (e.g. aircraft painting will require certain environmental facilities).

The following two charts represent the MRO industry growth (including projections) in:

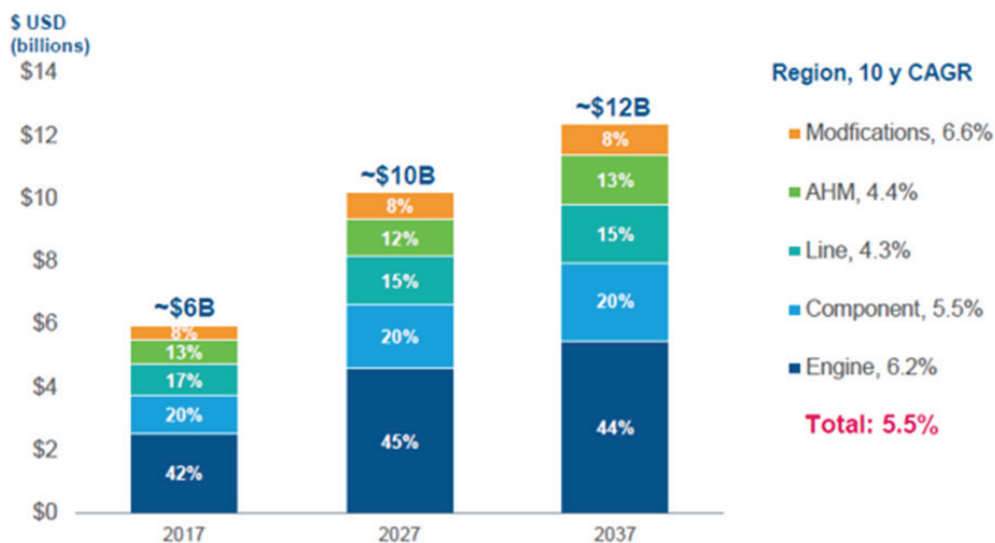
a) Western Europe (Figure 8) and b) Eastern Europe (Figure 9)

Figure 8: Projected regional growth: Western Europe



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

Figure 9: Projected regional growth: Eastern Europe



Source: ICF Analysis> CAPA 2017 constant USD. Provided by IATA.

Both Western and Eastern European markets represent the best opportunities for access by a future MRO based industry in Ukraine.

Other markets (customers) need to be evaluated on a case by case basis. These include:

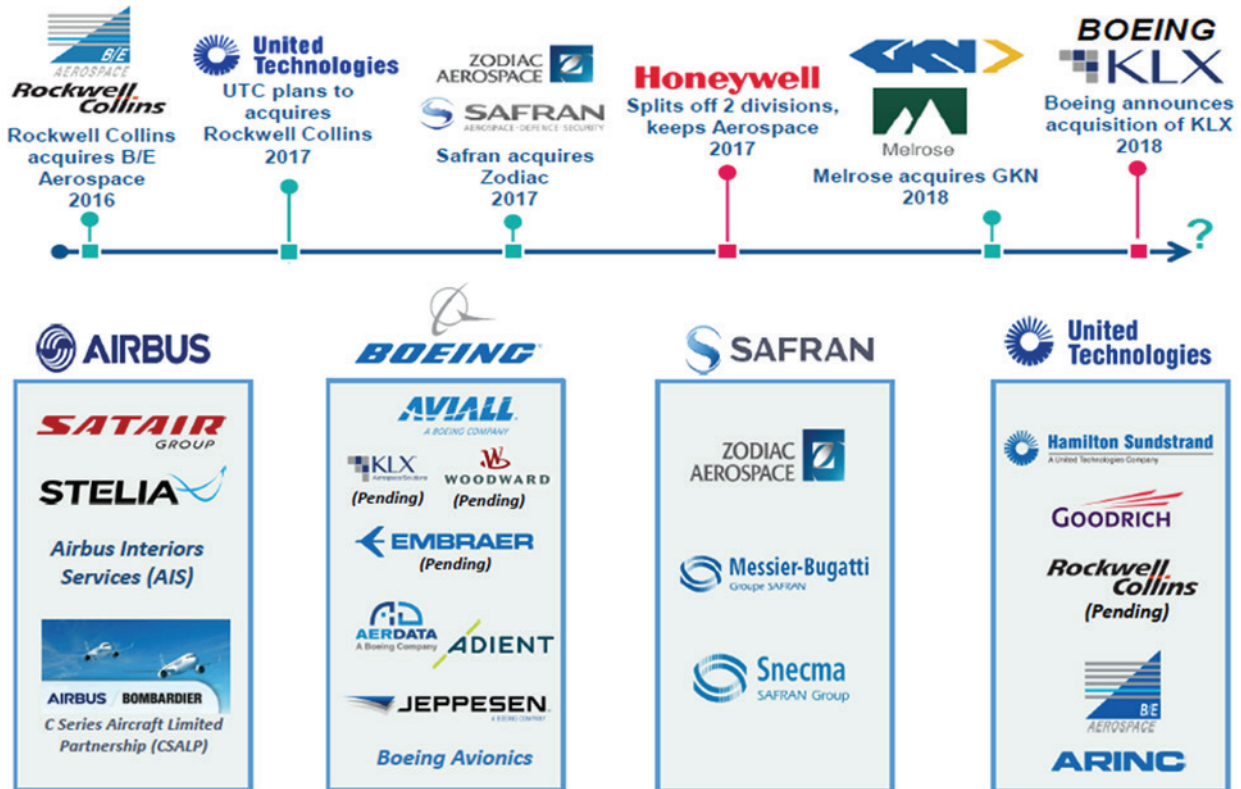
- relationships within the CIS, Asian, Latin American and African markets, and
- vision about the future of Aircraft (State Enterprise «Antonov») and Engine (Public Joint Stock Company «Motor Sich») manufacturing and related services in Ukraine.

The last two elements (a) and (b) were not considered as a possible path for the MRO sector development in Ukraine, since Western companies in the CIS, Asia, Latin America and Africa markets still operate USSR production aircraft. Such markets are too small and unpromising for the MRO sector. Regarding the development of aircraft production at the SE «Antonov», at the time of this study, information on plans to revive aircraft production of new models was missing. At the same time, the amount of revenues of PJSC «Motor Sich» significantly decreased during 2018–2019, which, in turn, does not allow to consider the markets of repair of engines of production of PJSC «Motor Sich» significant and promising.

## ◇ Other global market considerations

As stated earlier, the OEM market is undergoing significant changes that will have a significant impact on the aftermarket. The following chart shows a number of industry mergers and acquisitions in 2015-2018. Figure 10 shows the most significant ones. Additionally, Boeing's target to reach \$50 billion revenues in services has added new complexities in the MRO market. Certain possibilities of a future Ukraine-based MRO industry may allow for partnerships with one or more of these large OEMs.

Figure 10: OEM MRO business



Source: IATA

## ◇ Specific Considerations related to MRO activities

Several current MRO related activities present opportunities for consideration for MRO growth in Ukraine. These include but are not limited to:

a) Lease returns are a significant part of MRO work.

40% of aircraft are leased on a term basis (usually 5 to 10 years) and require more work during redelivery and transition to the new operator. This work includes heavy maintenance to bridge the aircraft from one operator's requirements (regulatory and commercial) to the other and marketing/operational changes to meet the new operator's specifications.

b) Digitalization of Aircraft Operations and Big Data Analytics.

New technologies from simple paper document scanning to predictive maintenance modelling and to the integration of data and information systems that lead to decision making. Such new developments will lead to significant opportunities in MRO IT and Analytics. Fields such as:

- E-enabled or connected aircraft
- Artificial Intelligence (AI)
- Machine Learning (ML)
- Planning and Optimization modelling
- Cybersecurity



Present areas of opportunity employing a well educated and trained Ukrainian workforce can be the cornerstone of such future growth.

c) Safe decommissioning of aircraft.

Over 12,000 aircraft will be retired in the next two decades. Parts removed from retiring aircraft will be used as «Used Serviceable Material (USM)». Also, significant environmental concerns about the disposal of aircraft interiors present challenges and opportunities in the infant decommissioning aircraft market. As this market is expected to grow, it may well be an area for potential MRO work.

#### Key takeaways

- In 2017, airlines generated \$754 billion revenue while incurring \$697 billion of expenses;
- The total fleet is estimated to approach 46,900 aircraft within the next decade;
- The total airline MRO spent for 2017 was about \$75.5 billion. This number represents about 11% of the total airline expenses;
- The Middle East and Asia Pacific based aircraft will be growing at an amount exceeding 5%; however, Europe will show a cumulative annual growth rate (CAGR) of 2.5%;
- The MRO market is broken into five large segments: engine maintenance, line maintenance, heavy maintenance, component repair, and modifications. Ukraine is well placed for heavy maintenance and modifications.
- Digitalization of Aircraft Operations and Big Data Analytics, as well as the safe decommissioning of aircraft, offer great opportunities for Ukraine.

### ◇ Local perspective

Ukraine belongs to the selective club of countries that have managed to develop an aviation industry. This refers to manufacturing aircraft, aircraft engineering, but also key aviation components such as aircraft engines, and the provision of aftermarket services – maintenance, repair and overhaul<sup>1</sup>.

The history of aviation in Ukraine can be traced back to the beginning of the 20<sup>th</sup> century. Significant events in global aviation history took place in Ukrainian territory. For example, the first aeroplane loop took place in the airspace above Kyiv in 1913 by pilot Petr Nesterov. Ukraine is also where the famous aircraft and helicopter designer Igor Sikorsky started his career and developed important designs before emigrating to the USA.

The strong aviation tradition of Ukraine provides a solid basis to develop related sectors into the future. Ukraine has most of the capabilities and key assets required to further develop the aviation industry. This includes a significant air transportation market, design and development expertise, testing facilities, manufacturing experience, and a long tradition of providing operational, technical maintenance, repair and overhaul support during the service life of aircraft.

### ◇ Structure of the civil air transportation regulations in Ukraine

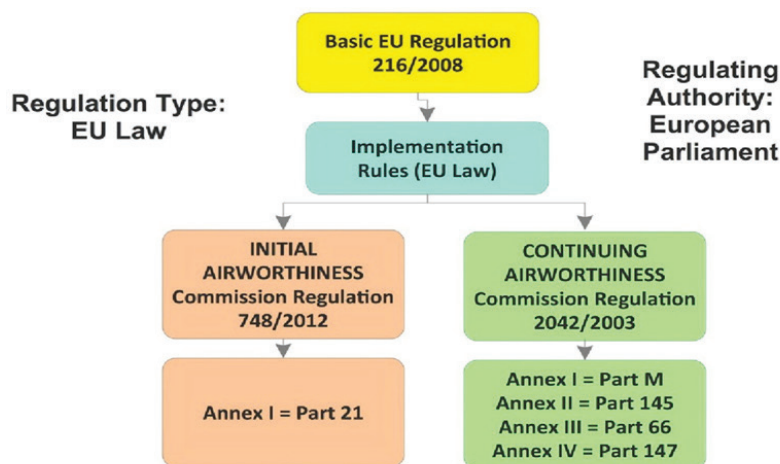
Due to historical reasons, most of the Ukrainian aviation industry and air transportation market have been structured under the influence of the model of the Soviet Union aviation industry and air transportation market.

Initial Airworthiness and Continuing Airworthiness are the two areas of regulation that are crucial to MRO services anywhere. In these areas, both the Soviet system and then the Ukrainian National system are quite similar because both have been following the western policies (European and USA).

For practical reasons, the current regulatory system looks at the EU as a model. The centrepiece of this model is the European Aviation Safety Agency (EASA). Figure 11 describes the current EU Regulatory structure that applies to MRO services.

<sup>1</sup> There are currently fewer than ten countries in the «club».

Figure 11: Regulatory structure under EASA.



Source: EASA

The Ukrainian regulations on Initial Airworthiness and Continuing Airworthiness (the basis for the MRO services sector) has components with similar titles to the EU ones. For instance, the Ukrainian Part-M, Ukrainian Part-145, Ukrainian Part-147 and Ukrainian Part-66.

The Ukrainian equivalent of EASA is the State Aviation Authority of Ukraine (SAAU). Its objective tackles implementation of the state policy in the areas of civil aviation and use of airspace of Ukraine. SAAU is the sole state organization responsible for updating regulations in aviation, as well as for control of aircraft airworthiness<sup>2</sup>. Its activities are subordinated to and coordinated by the Cabinet of Ministers of Ukraine through the Ministry of Infrastructure of Ukraine.

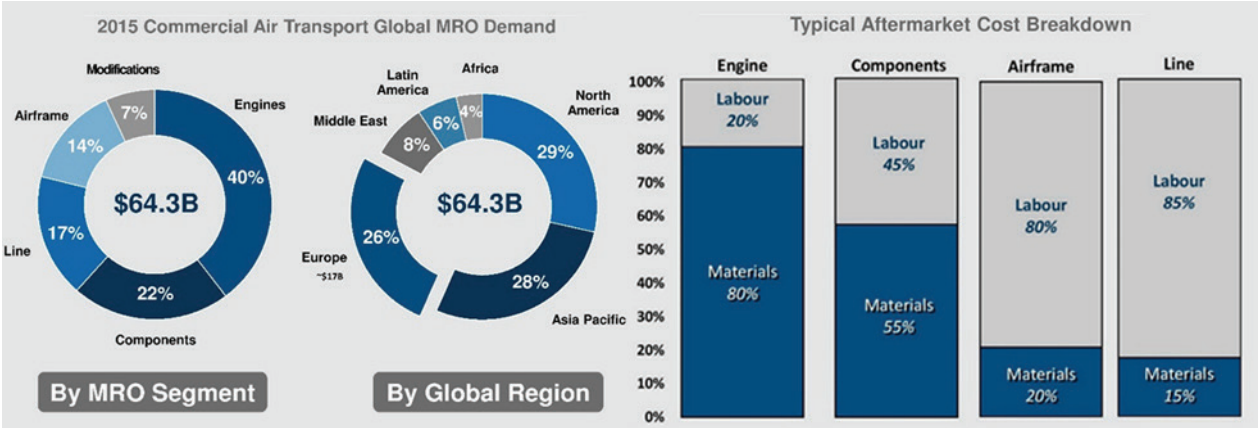
SAAU has an airworthiness department that is comprised of a «product type» certification subdivision and a «continuing airworthiness» subdivision. The MRO operations of foreign aircraft are supervised by the latter one. The key functions of SAAU's Continuing Airworthiness are:

- Drafting and amending the airworthiness rules;
- Registration of aircraft;
- Issuing Certificates of Airworthiness;
- Issuing Aircraft Noise Certificates;
- Issuing Aircraft Radio Licenses;
- Approval of the Rules for the Use of Airspace being the grounds for Flight Permits;
- Issuing Flight Permits;
- Initial approval for CAMOs activities;
- Continued supervision of CAMOs;
- Approval of aircraft maintenance programmes;
- Approval and supervision of AMOs (Part-145 and Part-M Subpart F);
- Approval and supervision of maintenance training organizations, as well as licensing of the maintenance personnel.

Figure 12 shows the existing MRO segments and basic cost structure (labour and materials). This is important to understand the opportunities available for Ukraine.

<sup>2</sup> Baseline legislative acts on SAAU's functions are: the Air Code of Ukraine dated 19 May 2011 No. 3393-VI, Resolution of the Cabinet of Ministers of Ukraine «On State Aviation Administration of Ukraine» dated 8 October 2014 No. 520.

Figure 12: MRO segments and cost breakdown

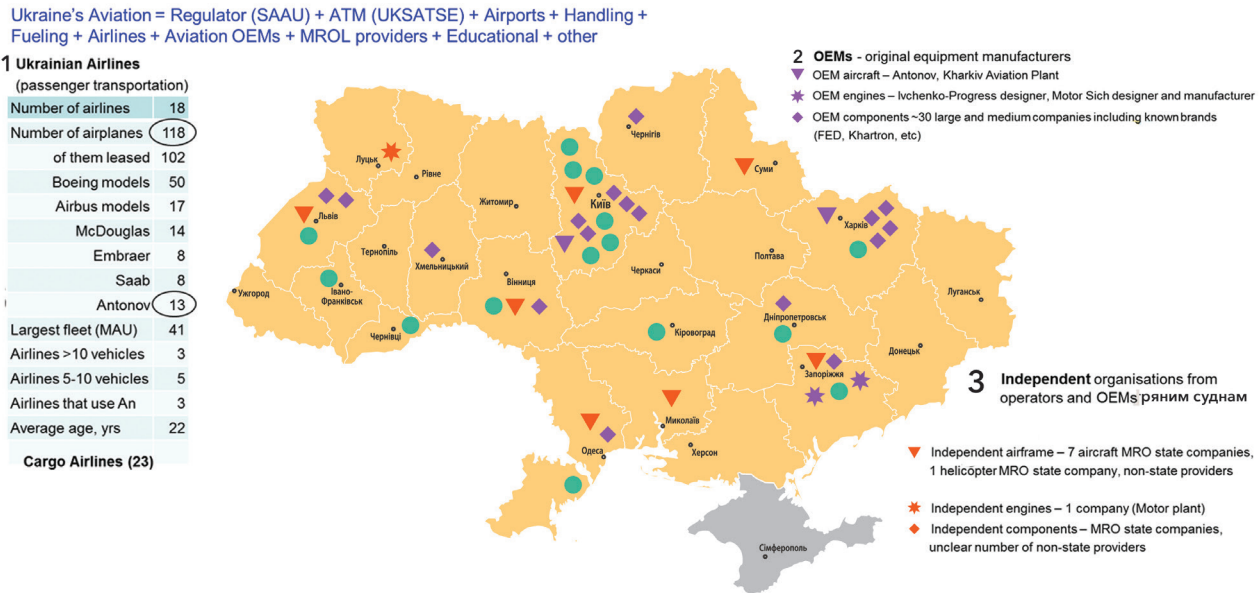


Source: National consultant based on IATA data

◇ MRO services in Ukraine

The MRO sector is quite diversified across many regions of the country. The main hub is based in Kyiv; there are important clusters in the east, as well. Figure 13 shows the geography and specialization of the MRO sector in Ukraine.

Figure 13: MRO services in Ukraine



Source: National Consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

MRO market in Ukraine can be divided into segments depending on the origin of the aircraft and/or the operator: 1) «Western aircraft models» – «non-Western (USSR, Ukrainian and Russian) aircraft models» and 2) «rendering services to Ukrainian customers (i.e. aircraft registered in Ukraine by Ukrainian operators – national market)» – «rendering services to non-Ukrainian customers (i.e. aircraft registered abroad by foreign companies – export)».



Figure 14: Key segments of the MRO sector in Ukraine

Key segments of MRO market of Ukraine (2 x 2)	
	Western aircraft models
Non-Ukrainian operators	<p>MRO services inside Ukraine on Western models for non-Ukrainian operators</p> <p>Fleet base – <b>very large and increasing (WE, CEE, EMEA):</b></p> <ul style="list-style-type: none"><li>•Airframe – Narrowbodies, RJs, turboprops, widebodies (?)</li><li>•Engines (?)</li></ul> <p>A 👍</p>
	Non-Western aircraft models
	<p>MRO services inside and outside Ukraine on non-Western models for non-Ukrainian operators</p> <p>Fleet base – <b>large and decreasing</b></p> <ul style="list-style-type: none"><li>•Airframe – Antonov, ARPs(Independent)</li><li>•Engines - Motor Sich, ARP(Independent)</li><li>•Components – OEMs, Independent</li></ul> <p>B 👎</p>
Ukrainian operators	<p>MRO services inside Ukraine on Western models for Ukrainian operators</p> <p>Fleet base ? – <b>small and increasing (Ukraine):</b></p> <ul style="list-style-type: none"><li>•Airframe – NBs, RJs</li><li>•Engines - ?</li><li>•Components - ?</li></ul> <p>C 👎</p>
	<p>MRO services inside and outside Ukraine for Ukrainian operators</p> <p>Fleet base – <b>small and decreasing :</b></p> <ul style="list-style-type: none"><li>•Airframe – Antonov, ARPs(Independent)</li><li>•Engines - Motor Sich</li><li>•Components – OEMs, Independent</li></ul> <p>D 👎</p>

Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

Figure 14 depicts classification.  
Mark 👍 – being good; 👎 – moderate; 👎 – average; 👎 – poor.  
These marks indicate different levels of potential for growth of services volumes.

Thus, we can distinguish four MRO sector segments in Ukraine:

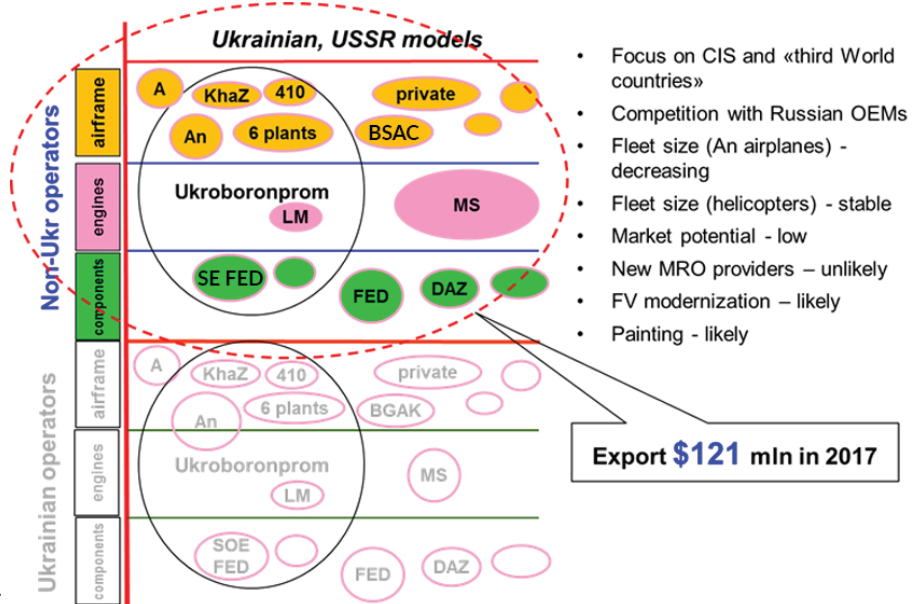
**Segment A: «Western aircraft models - Non-Ukrainian operators»**

This segment covers Ukrainian companies that provide MRO services to Western models of aircraft registered abroad. Owners, leasing entities and operators of these aircrafts are foreign companies. Provision of MRO services shall be deemed as services export from Ukraine, although physically these services are provided on the territory of Ukraine, by Ukrainian providers (exporters) and personnel.

**Segment B «Non-Western models - Non-Ukrainian operators»**

This sector covers Ukrainian companies, which provide MRO services to non-Western models of aircrafts (Soviet Union models, Russian models, Ukrainian models manufactured in Ukraine, including modernized, and exported from Ukraine) that are registered abroad. Owners, leasing companies or operators of these aircrafts are foreign entities. Figure 15 presents the key players.

Figure 15: Key non-Ukrainian operators in the country



Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

The provision of MRO services is qualified as export of services from Ukraine. Table 1 shows the likely recent trends in these segments<sup>3</sup>. Physically these services could be provided in the Ukrainian territory (temporary entry of aircraft into Ukrainian territory) or at foreign technical facilities by Ukrainian staff under contract with the Ukrainian provider (exporter).

Table 1: Exports of maintenance and overhaul segments

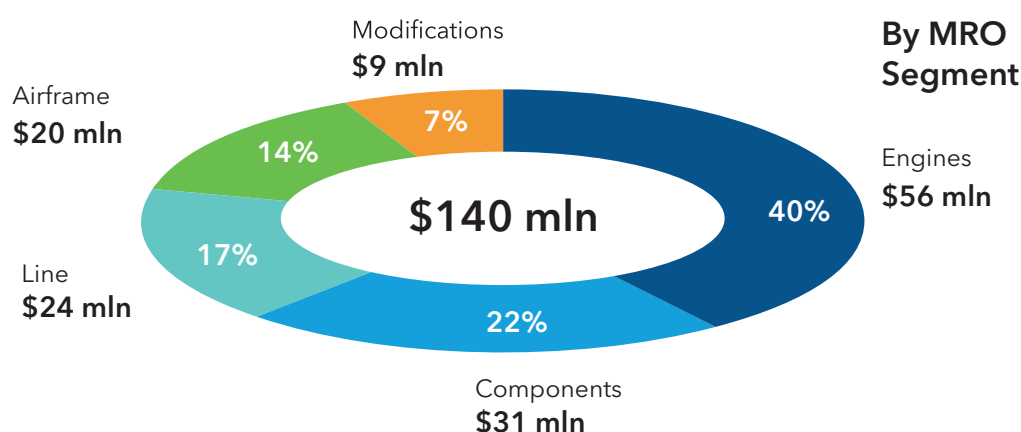
Ministry of Statistics of Ukraine			
\$ mln	2015	2016	2017
<b>Total MRO</b>	<b>93,8</b>	<b>121,8</b>	<b>121,2</b>
maintenance and line repair	24	31,4	31,1
overhaul and capital repair	69,8	90,4	90,2

Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023 based on data provided by the State Statistics Service of Ukraine.

### Segment C «Western models - Ukrainian operators»

Based on aviation statistics for 2016-2017, the total revenue of Ukrainian airlines/operators from passenger/cargo transportation services for 2017 was around UAH 30.6 bln. MRO amounts to approximately 11,3% of that figure or UAH 3.460 bln (USD 140 mln)<sup>4</sup>. The breakdown of the total volume by type of services is provided in Figure 16.

Figure 16: Breakdown of revenue per segment



Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023

### Segment D «Non-Western models - Ukrainian operators»

National Ukrainian market of MRO services provided to non-Western models of Ukrainian operators is represented by 84 large, medium and small companies, including industry leaders – Public Joint Stock Company «Motor Sich» (engines, helicopters), State Enterprise «Antonov» (airframes), State Enterprise «FED» (components) and others.

This segment is quite specific given that the total registered fleet of commercial non-Western aircraft (most produced by the State Enterprise «Antonov») amounts to approximately 10% of the total registered commercial fleet of Ukraine. As of 3 September 2018 there were

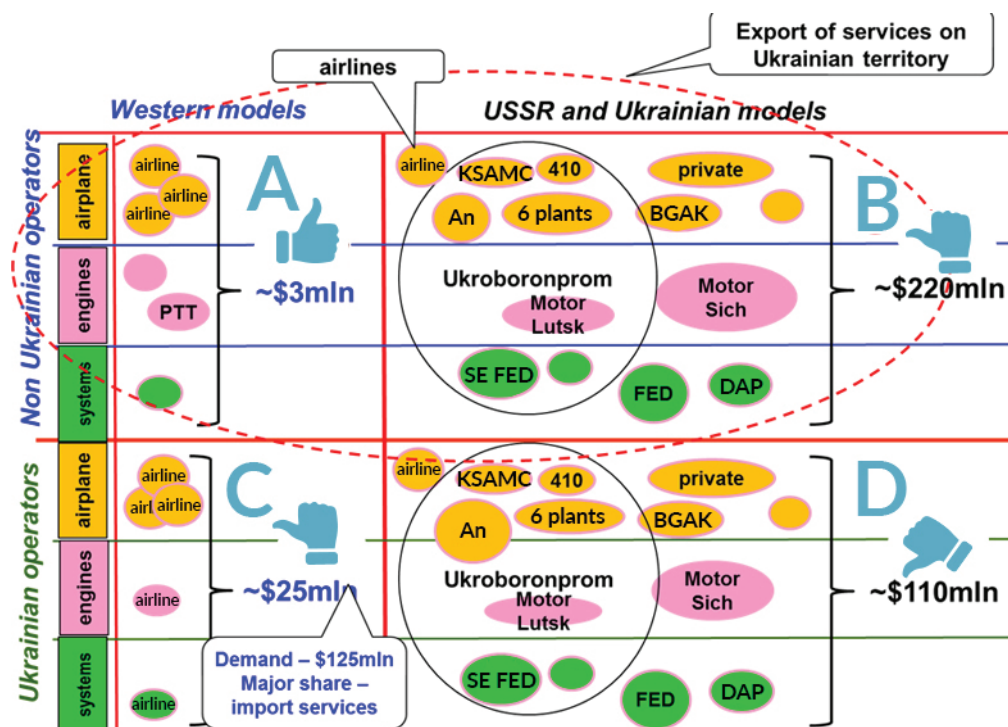
<sup>3</sup> The figure of \$121mln shall be taken as correct because it is not possible to verify the export of key players such as PJSC «Motor Sich» SE «Antonov», SE «FED». Another issue is whether 8 MRO-related companies of Ukroboronprom are included in official statistics – the major share of their revenue come from the export of services rendered to military and dual-use (transport) aircrafts. The figure should be interpreted as a baseline for the MRO sector in Ukraine.

<sup>4</sup> The figure of \$140mln – is an estimation based on Global MRO market proportions and trends. Although initial statistics on the Air Transport market is not so perfect – there are white spots there that can be filled by assumptions and analogy. Real volume and structure of spending on MRO services likely are quite different, but it is not possible to identify the real picture without a time-consuming study.

924 registered aircrafts in Ukraine: 114 being large western airplanes, 86 – non-western airplanes, 122 – non-western helicopters. In addition to the above total figure, we should note a number of helicopters, most of which are currently non-operational.

The volume of MRO services in segment D can be estimated at the level of \$20 mln/year. Therefore, it is possible to estimate the overall volume of MRO market of Ukraine as high as <~\$300 mln in 2017. The structure of the market is provided by Figure 17.

Figure 17: Structure of the MRO market



Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023

There is handful of the reliable, detailed statistics in MRO sector; plus, insignificant data of the state and private enterprises in terms of the structure of their revenue and expenses are publicly available, hence the breakdown of the MRO market per its key segments («airframe», «engines» and «components») can be hardly assessed.

#### Key takeaways

- The Ukrainian aviation industry and air transportation market have been influenced by the USSR model. Synchronization with the EU regulations is quite slow.
- The MRO sector is quite diversified across many regions of Ukraine.
- The total revenue of Ukrainian airlines/operators from passenger/cargo transportation services in 2017 amounted to ~ UAH 30,6 bln.
- There is no detailed and reliable statistics on the MRO market in Ukraine.

#### ◇ Current value chain

##### Providers of MRO services in Ukraine

SAAU is responsible for certification of MRO services providers. According to international standards, there are different categories of providers – aircraft operators (airlines), original equipment manufacturers (OEMs), independent providers.

Besides the companies registered in Ukraine, SAAU issued Ukrainian Part-145 certificates to foreign companies. The overall statistics are as follows:

MRO operators in Ukraine	at 3 Sept 2018
<b>Ukrainian companies</b>	<b>84</b>
Airlines	37
OEMs	12
Independent providers	34
Airports	1
Companies at other countries	56
<b>Total N° of Part-145 licenses</b>	<b>140</b>

Source: SAAU, National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

A key parameter to assess the importance of industrial or economic activity is the number of employees engaged in that industry or sector. There is no statistical data sufficient to enable assessment of the number of employees involved in the MRO sector. The main reason is the lack of data on the number of MRO-engaged employees in the total workforce of medium and large companies for which MRO is not core business activity.

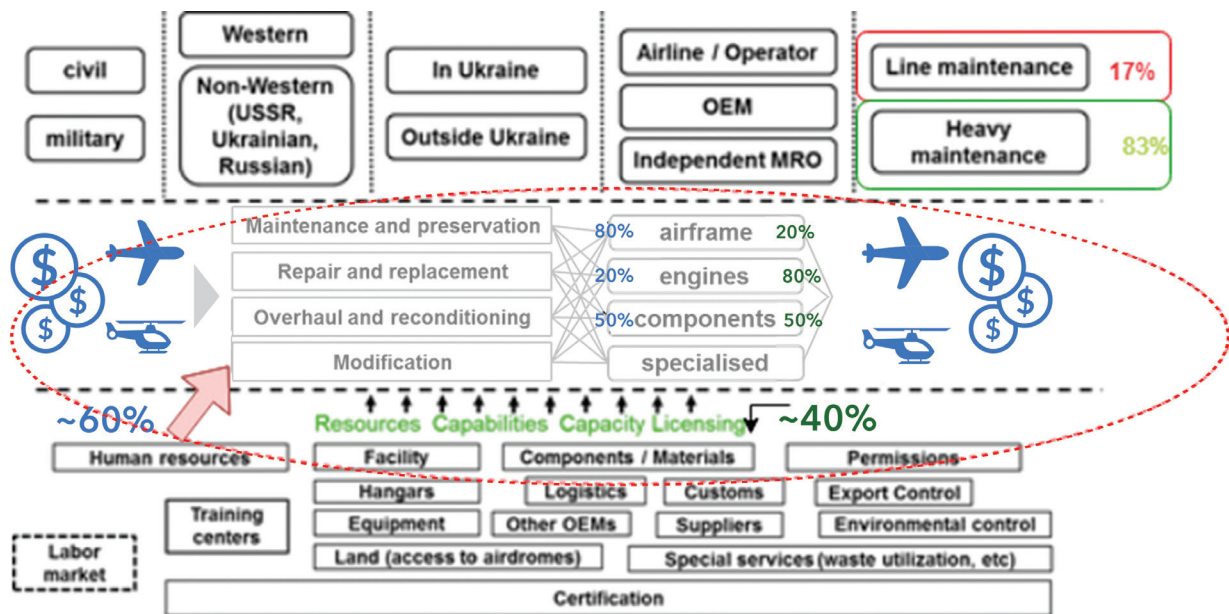
Such situation relates to key OEMs – engine manufacturer PJSC «Motor Sich» and airplane manufacturer SE «Antonov». Currently, there is no information on the number of their staff engaged in the rendering of MRO services; the total number of their employees amount to ~24,600 in PJSC «Motor Sich» and ~10,000 in SE «Antonov» (early 2018).

The same situation is with other large and medium companies – publicly available information, and official statistics do not provide a breakdown of employees by sector (assuming that MRO is one of them).

#### Value Chain of the MRO services in Ukraine

The sector value chain of the MRO services is provided in the central part of Figure 18:

Figure 18: Current structure of the value chain



Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

The upper section describes the comprehensive specialization of MRO organizations (segments), depending on various parameters – military/civil, Western/non-Western, MRO geography, type of provider, type of services. The reasons behind any specialization are quite different – historical factors, equipment availability, ownership type, relationships with customers, licenses, etc.

The bottom section describes resources and permissions required for any MRO specializations and which impact the MRO added value in terms of the main business process provided at the central block.

## SECTOR DIAGNOSTICS

A country's competitiveness depends on a number of factors that impact the capacity of its firms to compete in the marketplace, connect with its customers and adapt to changing environment. For an export strategy to be effective, it must address a broader set of constraints across all three dimensions of competitiveness. Figure 19 provides an integrated approach of SME Competitiveness Grid framework.

Figure 19: The 3C Framework: the SME Competitiveness Grid

Pillars of competitiveness	Compete	Quantity and Cost Requirements
		Logistics requirements
		Quality requirements
	Connect	Connecting to buyers
		Connecting to suppliers
		Connecting to institutions
	Change	Financial requirements
		Skills requirements
		Innovation and IP requirements

### ◇ Competition in national and foreign markets

Competition is the static dimension of competitiveness. It assesses whether available products are efficient and meet market demand.

#### Box 1: Competitiveness constraints: Competition

##### Competitions in national and foreign markets

###### Quantity and cost requirements

- Customs duties on key imported inputs erode the competitiveness of the MRO sector.
- The shallow domestic MRO market limits growth and diversification opportunities.
- The absence of adequate infrastructure around airports is a major constraint to the expansion of MRO operations.
- Companies face considerably higher border compliance costs than EU competitors.
- The process to obtain permission to import inputs considered as «dangerous» by the authorities is too costly.

###### Time requirements

- Customs clearance procedures are long and do not satisfy the time requirements of clients.
- The procedure to obtain permission to trade spare parts with dual-use is long and cumbersome.

- State authorities take a long time to process regular correspondence and applications.

#### Quality requirements

- The loss of EASA certification and the absence of an equivalent FAA certification threatens the existence of the sector.
- Domestic components used in MRO operations often fail to comply with international technical regulations and widely accepted standards.
- Absence of respective legal status of the state providers of MRO services.

## Quantity and cost requirements

### **Customs duties accrued on key imported inputs erode the competitiveness of the sector.**

The high value of imported inputs hampers the production capacity of domestic enterprises and significantly increases the cost of domestic services<sup>5</sup>. The sector significantly depends on imports given that most components have to be sourced from the international market (directly from OEMs or in the downstream aftermarket). In terms of the customs evaluation of the used spare parts, customs authorities treat them as new ones<sup>6</sup>. There is no domestic alternative since domestic manufacturers cannot compete with imported products in terms of quality, quantity, cost, or product range. Furthermore, imported components are more expensive due to the lower order volumes, higher transportation costs, high import duties and other charges. Also, there is no registry of the MRO spare parts and components, which are produced locally. Taxes are sometimes accrued on components on the aircraft being in transit in Ukraine (for example, as a part of regular air transportation services).

*These constraints are addressed in PoA: 1.1.5.*

**Shallow domestic MRO market limits growth and diversification opportunities.** The domestic market is too shallow to ensure economy of scale. This results in higher production costs and lower efficiency. Ukraine International Airlines' recent decision to spinoff its MRO operations into a separate subdivision is in tune with the best international practices globally.

*These constraints are addressed in PoA: 2.1.4. and 2.2.2.*

**The absence of adequate infrastructure close to airports is a major constraint to the expansion of MRO operations.** The lack of adequate hangar and warehouse infrastructure limits the development of existing operators and is as a barrier to entry by the new participants. The limited availability of adequate infrastructure acts as a deterrent for new operators who are willing to expand their business.

*These constraints are addressed in PoA: 2.1.5. and 2.2.1.*

**Ukrainian MRO operators face considerably higher border compliance costs than EU competitors.** MRO operators are big traders. Border compliance costs both when exporting and importing are high. This limits the capacity of MRO enterprises to offer a broader range of services. The procedures for customs clearance, inspections by other agencies, port or border handling, and the processing of documents are costly and time-consuming. Competitors like Hungary and Poland do not face such difficulties. In addition, custom officers often evaluate the products used in the MRO operations without depreciation (e.g. re-use of engine part will be subject to the same duties as a new one).

*These constraints are addressed in PoA: 1.1.5, 1.2.1. and 1.2.2.*

**Obtaining regulatory permission to import components deemed as «dangerous» is too costly.** This is the case for instance, with the filled fire extinguishers that are used in airplane anti-fire system. Extinguishers are filled with a special gas under high pressure. Since these are manufactured abroad, one must demonstrate the way they work to the responsible state authority in order to obtain permission for system installation onboard of Ukrainian or Western models. Following costly testing, competent state authority should typically issue a

<sup>5</sup> Spare part trading is done based on listed market prices. Import duties are around 1 % of the maintenance cost. Improving poor contract negotiating skills could offset this margin.

<sup>6</sup> There are several ways out - components can be declared as «temporarily imported»; duties exemption can be provided to products «supplied within the framework of an international strategic agreement».



certificate. Companies have to purchase additional units for demonstration purposes. Such units are expensive (several thousands of USD). State authorities do not accept certificates from manufacturers that are recognised in Western and other countries and are recognised by EASA and FAA certification.

*These constraints are addressed in PoA: 1.1.3, 1.1.4. and 1.2.2.*

## Time constraints

**Customs clearance procedures are lengthy and do not meet clients' deadlines.** Import of the components used for MRO services is heavily impacted by the customs duties and procedures. The tariff grid does not separate spare parts used for civil aviation, hence such parts are often treated as non-aviation or military equipment, which results in time-consuming and costly customs clearance. Temporary import is not sufficiently clarified by the law and does not tackle the priorities and specifics of the sector.

Exporting MRO services implies the capacity to import a wide range of components efficiently, that can only be sourced internationally. Imports of certain groups of components installed as a part MRO services are not currently regulated (e.g. ready-to-use high-pressure reservoirs containing dangerous substances, for instance, fire extinguishers). Lack of efficient customs procedures, duly trained customs officers and brokers impairs the development of MRO services exports<sup>7</sup>.

*These constraints are addressed in PoA: 1.1.4, 1.1.5. and 1.2.2.*

**The procedure to obtain permission to trade spare parts with dual-use is long and cumbersome.** Key components used to repair civil aircrafts often have a dual-use (military and civil). Trading these parts requires a special permit. The existing procedure takes 15 days (when all documents perfectly meet regulatory requirements). Whenever an inter-agency approval by other state organizations is necessary, the process takes approximately up to 90 days. Companies must also go through a registration process that takes a minimum of 30 days if no issues with the documents are found. In case there is a need for approval of other state authorities, the process can take up to 60 days. These time constraints impede urgent purchases of spare parts that are not common for MRO.

*These constraints are addressed in PoA: 1.1.4, 1.1.5. and 1.2.2.*

**Processing of regular correspondence and applications by the state authorities is time-consuming.** This is particularly relevant for the lengthy and cumbersome procedure of obtaining permits to trade spare parts with dual-use<sup>8</sup>.

*These constraints are addressed in PoA: 1.1.4. and 1.2.2.*

## Quality requirements

**Loss of EASA certification and lack of an equivalent FAA certification undermines the sector operation and development.** Until recently, MRO operators in Ukraine obtained EU certification through the French Civil Aviation Authority. However, the situation changed after national civil aviation authorities transferred respective functions to EASA. Currently, EASA is the only EU authority that has competence over maintenance organizations having their principal place of business outside of the EU. EASA is therefore responsible for the final approval of activities of maintenance organizations and for establishing procedures that manage these EASA Part-145 applications and approvals. Following foregoing transfer, Ukraine lost EU certification. This resulted in barriers to entry to the EU market. The main constraint to get an EASA certification is the cost thereof (around EUR 40K-50K). Small and middle MRO business cannot afford such costly certification.

*These constraints are addressed in PoA: 1.1.2, 1.1.3.*

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<sup>7</sup> Customs clearance should take half a day but often is more time consuming, which may be critical for the business. Moreover, cooperation within the sector is very low; thus the MRO firms cannot forward an order to other firm or sources from its required product.

<sup>8</sup> Most of the restrictions applicable to dual-use products were implemented during the early post-soviet period to prevent «grey» supplies to Russia. These restrictions are broadly interpreted – even an ordinary propeller may be considered as a dual-use product. Some of these restrictions may not be relevant or necessary anymore.

**Domestic components used in MRO operations often fail to comply with international technical regulations and standards.** As the country with the full aircraft industrial cycle, Ukraine has developed legislation on aviation-related issues. Local regulations are met, though the local certification body is not internationally certified. In addition, the authorities make every effort to keep the aviation-related legislation updated and relevant (much of it was inherited from the Soviet times). The process of update and translation it into English is time-consuming and is limited by the availability of qualified translators having relevant skills.

Aircraft manufacturers provide MRO firms with the standards that each product and material used shall satisfy. The MRO firms are free to choose among producers of products and materials. Many of these (mostly chemicals) are produced locally; however, only a limited number is certified and thus acceptable for use by MRO operators in their activities. Absence or limited availability, of certified laboratories, makes exporters seek for foreign competent accredited labs and certifications companies in order to obtain necessary certification for their products. This is an added cost incurred by local operators.

***These constraints are addressed in PoA: 1.1.1. and 1.1.2.***

**State MRO services providers do not possess civil aviation activity status.** At the time of adoption of the Air Code of Ukraine<sup>9</sup> all eight state aircraft repair plants were owned by the Ministry of Defence of Ukraine<sup>10</sup>. Following the establishment of Ukroboronprom<sup>11</sup> these enterprises ceased to be controlled by the Ministry of Defence of Ukraine; moreover, according to article 1 of the Air Code of Ukraine they fell beyond the legal framework that regulates aviation activity: definition of the «state aviation» does not cover state MRO facilities. This results in complications in the context of flight testing, registration of airdromes designated for the flight testing and provision of MRO services that require flying testing.

***These constraints are addressed in PoA: 1.1.1, 1.1.3. and 1.1.4.***

## ◆ Connect to suppliers, markets and clients

Connectivity is yet another dimension of competitiveness. To be competitive, enterprises must link to customers, businesses, institutions, and be literate in information and communications technologies.

### Box 2: Competitiveness constraints: Connect

Business environment constraints
<p>Connecting with buyers</p> <ul style="list-style-type: none"> <li>Currently, MRO is an infant market compared to other aviation sectors. MRO is not sufficiently supported by the state to enable proper promotion and facilitation of the sector. Therefore, awareness of potential customers is scarce, which precludes sector's growth.</li> </ul> <p>Connecting with suppliers</p> <ul style="list-style-type: none"> <li>Weak linkages among sectors, as well as with international suppliers, limit the generation of business opportunities for local MRO operators.</li> <li>Lack of adequate regulations and facilities to dispose of aircraft flammables and other hazardous substances.</li> </ul> <p>Connecting with institutions</p> <ul style="list-style-type: none"> <li>Authorities lack reliable statistics and intelligence in respect of domestic MRO sector.</li> <li>MRO operators have limited awareness of the services that the trade support network offers.</li> <li>There are inefficiencies in the long-term management, allotment, and use of the land around airports.</li> </ul>

<sup>9</sup> Air Code of Ukraine dated 19 May 2011 No. 3393-VI.

<sup>10</sup> This relates for example, to the company Aviacon (Aircraft Repair Enterprise) that organizes flight testing, hence carries out aviation activity.

<sup>11</sup> On Establishment of Public Concern «Ukroboronprom», approved by the Resolution of the Cabinet of Ministers of Ukraine dated 29 December 2010 No. 1221.



## Connecting with buyers

**Currently, MRO is an infant market compared to other aviation sectors.** Trade promotion activities linked to the aviation and MRO sectors are scarce. This limits contacts and linkages with partner countries and hinders the expansion of MRO services. The lack of promotional activities limits the visibility and awareness of Ukrainian MRO offering overseas. Large companies participate in the national and international fairs. Companies such as SE «Antonov» and PJSC «Motor Sich» enjoy governmental access and support. However, the smaller firms do not have access to information on conferences, trade fairs, or similar events. They are hesitant on how they can start exporting notwithstanding the capacity they have.

*These constraints are addressed in PoA: 2.1.4. and 2.2.2.*

## Connecting with suppliers

**Weak linkages among sectors, as well as with international suppliers, limit the generation of business opportunities for local MRO operators.** There are scarce linkages among the different economic sectors at the policymaking level. Even at the firm level, the linkages of the MRO sector with other sectors are scarce. MRO operators are often unaware that a particular input might be sourced within the country (for example, chair covers); hence, these inputs are imported. At the same time, some national producers could supply specific consumables provided they meet strict aviation requirements. These products are currently imported, however with the proper support they could be produced locally. This limits business and development opportunities for the domestic MRO sector.

*These constraints are addressed in PoA: 2.1.2, 2.1.4, 2.2.2.*

**Lack of adequate regulations and facilities to dispose of aircraft flammables and other hazardous substances.** The suppliers of respective services are not adequately present. At the moment, used vests, masks, paint, cisterns, chemicals are simply stored in warehouses. The firms have to incur storage costs and are not able to dispose of these items<sup>12</sup>. The legislation governing waste disposal is underdeveloped. Legal framework on physical disposal of chemical waste resulting from aircraft painting is absent as well. MRO discharge, temporary storage and aircraft refuelling services are not efficient and do not meet customers requirements.

*These constraints are addressed in PoA: 2.1.3.*

## Connecting with institutions

**Authorities lack reliable statistics and intelligence in respect of domestic MRO sector.** Incapacity to identify trends, receive and process statistical data, and distribute it timely and adequately, limits the capacity of policymakers to design adequate policies to support MRO firms. Lack of an open data platform makes it difficult for enterprises to obtain relevant statistics and market information. Enterprises do not trust the system and are not willing to disclose their data; they are concerned that third parties will get unauthorized access to such data and will use it to detriment the MRO business.

*These constraints are addressed in PoA: 2.1.1.*

**MRO operators have limited awareness of the services that the trade support network offers.** The limited awareness among MRO firms of the services that the trade support network could make available to them ends up in the underutilization of the services. The trade support institutions provide a number of services that can facilitate the enterprises' operations. However, most firms do not use them because they are not aware of the services on offer.

*These constraints are addressed in PoA: 2.1.4.*

**There are inefficiencies in the long-term management, allotment and use of the land around airports.** Inappropriate use and management of the area around airports create a problem for the mid-to-long term development of the existing MRO operations. Moreover, the absence of effective planning, unplanned settlements, and construction of high buildings around airport areas undermine the future of many MRO firms. All airports with

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<sup>12</sup>When the waste is generated within the territory of an airport, the airport shall be responsible for its handling. When the services are provided outside the airport territory, a respective firm has to take care of the disposal.

paved strips are state-owned. The lack of awareness among local self-government officials of the impact of these actions on the future of the MRO sector is key. Those cities that have masterplans for their land around airports are not ready to allocate plots for MRO operations development.

*These constraints are addressed in PoA: 2.1.5.*

## ◇ Change, innovate and tap into emerging trends

Change is the dynamic dimension of competitiveness. It assesses whether enterprises have the capacity to make personal and financial investments to adapt to fast-changing markets.

### Box 3: Competitiveness constraints: Change

Change, innovate and tap into emerging trends
<p><b>Financing requirements</b></p> <ul style="list-style-type: none"> <li>• Limited access to affordable long-term financing limits the development of the sector.</li> <li>• There is a lack of coordination, collaboration, and alignment for institutional support of MRO sector between trade and investment support institutions.</li> </ul> <p><b>Skills requirements</b></p> <ul style="list-style-type: none"> <li>• A mismatch exists between the skills that MRO firms require and those that the educational system produces.</li> <li>• Firms lack necessary management skills in areas such as marketing, budgeting, planning, and customer service.</li> <li>• Qualified technicians and engineers migrate to competing countries offering better salaries.</li> </ul> <p><b>Intellectual property and innovation requirements</b></p> <ul style="list-style-type: none"> <li>• Lack of innovations in the MRO sector.</li> <li>• The absence of incubation or acceleration/support system hinders the creation of start-ups and new enterprises.</li> </ul>

### Financing requirements

**Limited access to affordable long-term financing constrains the development of the sector.** Currently, there is no clear vision of how to attract foreign and local investments into the MRO sector. This limits the range of MRO services and hinders the development of auxiliary infrastructure and innovation services.

*These constraints are addressed in PoA: 2.2.1, 2.2.2.*

**There is a lack of coordination, collaboration, and alignment for institutional support between trade and investment support institutions.** The limited cooperation and coordination between multispectral agencies and entities result in a lack of a single vision to support trade development and poor planning of trade-related activities. There is no policy/strategy in place to guide government agencies efforts, which leads to misallocation of resources. In addition, the insufficient level of institutional support and lack of structured dialogue between the state authorities and business encumbers the development of the private sector.

*These constraints are addressed in PoA: 2.2.2.*

### Skills requirements

**A mismatch exists between the skills that MRO firms require and those that the educational system produces.** The local availability of MRO-related skills is a significant threat to the sustainability of the MRO sector. Qualified labour-force finds better-paid opportunities overseas. This is a binding constraint to economic growth and the development of the sector. The educational infrastructure including Technical and Vocational Education and

Training (TVET) and tertiary education is underdeveloped to cater to the needs of the aviation and MRO sectors. In addition, when the graduates enter the job market, they have little to no practical experience due to minimal opportunities of apprenticeship during their studies.

*These constraints are addressed in PoA: 3.1.1.*

**Firms lack required management skills in areas such as marketing, budgeting, planning, and customer service.** The limited availability of human resources with effective client-oriented managerial skills results in inefficient workflow management. The lack of capacity building initiatives to introduce new methods of production and technology and few on-the-job training to build skills, hinder human capital expertise and experience. Limited availability of affordable quality training for existing exporters and producers hamper their development competencies. Human resources with outstanding English skills are scarce.

*These constraints are addressed in PoA: 3.1.2.*

**Qualified technicians and engineers migrate to competing countries offering better salaries.** The brain drain issue disproportionately affects the MRO sector. A qualified individual with outstanding technical skills migrates to EU countries. The problem disproportionately affects the youth. Enterprises hiring young specialists as their first job enjoy no benefits. There is a deficit of skilled workforce specialized in MRO in the labour market.

*These constraints are addressed in PoA: 2.2.2.*

## Intellectual property and innovation requirements

**Lack of innovations in the MRO sector.** There is no innovation strategy based on incentives and rewards for MRO enterprises adopting innovative approaches. MRO firms face multiple difficulties to innovate: lack of financial resources, human capacity, and the limited size of the local MRO market, just to name a few. However, more importantly, policymakers lack a conceptual framework for how innovation in the sector is to take place. Innovations are also hampered by the cumbersome patenting process of the local solutions along with mandatory EU certification requirement to use such solutions onboard foreign aircraft. Certification of local solutions is too costly for the local operators.

*These constraints are addressed in PoA: 2.1.4, 2.2.2, 3.1.1.*

**The bulk of the MRO-related legislation and regulatory body does not exist in English.** The process of updating legislation and translating it into English is lengthy and is limited by the availability of human resources with specialized legal skills in a handful of regulatory agencies.

*These constraints are addressed in PoA: 1.1.2.*

**The absence of incubation or acceleration/support system hinders the creation of start-ups and new enterprises.** Currently, there is no organized business incubation programme for the MRO sector that would provide physical infrastructure and support services for firms. No dedicated agency is assigned to assist with the development of business incubation, promotion and facilitation of knowledge creation, innovation and entrepreneurship activities.

*These constraints are addressed in PoA: 2.1.2, 2.1.4.*

# THE WAY FORWARD

Based on the comprehensive analysis of the MRO sector in Ukraine, the «way forward» lays down the key strategic framework of the sector strategy comprising the vision statement, the strategic and operational objectives, a selection of priority sectors and cross-sector functions, as well as the Plan of Action.

## ◇ Vision and strategic objectives

To guide the implementation of the sector strategy in the next five years, the vision statement set out below has been formulated and agreed upon by stakeholders who participated in the consultations for the design of this Strategy<sup>13</sup>. It represents the ambitions of the country as well as a consensus among stakeholders over the role of MRO exports in the Ukrainian economy today and in the near future.

The following is a delineation of the proposed vision and strategic approach in this direction agreed with all national stakeholders<sup>14</sup>.

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### «Exports for sustainable development and success on global markets»

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To implement the vision, strategic objectives have been formulated; these will guide the implementation of the Strategy in the three strategic directions. Their implementation will require proper actions to be taken during the next five years. The three strategic objectives are as follows:

#### 1. To harmonize the Ukrainian MRO regulations with respective EU acquis and to adapt existing trade regulations to the needs of the sector.

Aviation is a heavily regulated sector. Regulatory authorities play a key role by determining the technical requirements that apply across countries or entire regions. There are two main regulatory models that are widely accepted: the European one centred around EASA, and the Federal Aviation Administration (FAA) in the USA<sup>15</sup>. These two models are becoming more aligned over time as a result of the gradual adoption of similar widely recognized technical regulations and safety standards. MRO operators need to be either EASA or FAA certified in order to be able to compete<sup>16</sup>.

In addition to international aviation regulations, Ukrainian MRO operators are subjected to the usual set of regulations that affect trade in goods and services. These include tariffs on imported goods but also regulations affecting the holdings of foreign exchange. Given that the national production of the key components and spare parts that the MRO sector requires is relatively scarce, these «indirect» regulations can have a significant impact on the development of the sector.

This strategic objective aims at adapting the set of Ukrainian regulations affecting the MRO sector to ensure that they do not interfere with the long term development of the sector. The relatively small size of the national market restricts the opportunities for local MRO firms to grow and exploit economies of scale. Hence, the Ukrainian MRO sector needs to be outward-looking to grow. Overseas growth opportunities will only be seized with adequate regulations. In fact, regulatory harmonization with the EU is a matter of life or death for the sector.

At the operational level, the following sub-objectives have been conceived:

- **Synchronization of Ukrainian MRO regulations with EU ones.** The Ukrainian aviation regulations should lean towards synchronization and adaptation with the aviation

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<sup>13</sup> These consultations took place in Kyiv during the June, September and November of 2018. Key stakeholders of the MRO sector discussed aspects related to trade performance, regulations, the innovation and investment framework, the institutional landscape, development plans, and the MRO competitiveness constraints.

<sup>14</sup> Another example of a vision that comes to mind is JFKennedy's «Sending an American safely to the Moon before the end of the decade of 25 May 1961».

<sup>15</sup> There are other such as The Japan Civil Aviation Bureau or the Federal Agency for Air Transport in the Russian Federation.

<sup>16</sup> Ideally both. This is the case for the main world players of MRO services.

regulations of the EU. The survival of the MRO sector in Ukraine hinges on obtaining EASA certification for the local operators;

- **Reducing the regulatory and administrative burden on MRO enterprises and investors.** Removing barriers and unnecessary burdens or regulations on MRO operators and potential investors is a priority while ensuring that good governance and convergence to EU regulations prevail. The way forward involves adapting existing trade regulations by cutting red-tape and reducing bureaucracy. Trade regulations affecting the MRO should be more client-oriented. This means allowing MRO firms to fast-track the clearance of spare parts at customs and relaxing export control area regulations on goods and services of dual-use used for MRO services provided to civil aircrafts.

A long term view of this strategic objective would involve Ukraine joining the selected group of countries like Norway and Switzerland that are not members of the EU but have special working arrangements with EASA. In this logic, the harmonization of laws and regulations with EU ones in the short term is a prerequisite for greater future regulatory cooperation with EASA. Addressing these measures has a significant bearing on the quality of the business environment in particular for exporting MRO firms. In the short and medium-term, the hard infrastructure should be taken as given, and the policy focus be placed on regulations.

## **2. To develop a strong reputation for affordable, high-quality MRO services and a conducive business environment.**

While improvements in the regulatory environment for MRO firms (addressed through the previous strategic objective) will reduce the regulatory burden and the costs of doing business for the operators, this alone will not be enough for the Ukrainian MRO sector to take off. Expanding the national productive capacity requires strengthening local MRO operators to produce and to sell their services profitably.

A combination of home-grown capacity enhancements with selective knowledge and attraction of foreign investments is proposed as the way forward. This should be supported by further strengthening the business environment and a strong marketing and communication effort to reach out to potential customers.

A key component of this objective consists of ensuring that foreign investments stimulate innovation, economies of scale and an improved business environment. In the long run, fostering collaborations on innovation between enterprises and educational institutions is a key element of this strategic objective. A strong branding initiative and marketing effort will support this objective.

At the operational level, there are the following sub-objectives:

- **Providing value-adding services and infrastructure to MRO enterprises and investors.** This operational objective is about improving the quality of business and trade support services offered to MRO operators. This means addressing the practical issues such as the disposal and re-utilization of chemical waste from painting aircrafts, addressing lengthy processing of applications on leasing facilities that belong to the state or to local communities. The MRO sector needs a coordinated network of institutions that provide effective, value-adding and affordable services. The way forward also involves ensuring effective decision-making through better data collection and dissemination for policy-makers, investors, and businesses;
- **Attracting financing and knowledge and capacity through enhancing foreign direct investment in the aviation and MRO sector.** This operational objective consists of improving the investment attraction capacity to expand the sector and to retain value-added locally. The way forward consists of partnering with the best MRO operators to invest in Ukraine with a common goal of shared prosperity;
- **Developing a strong brand for high-quality MRO services at a competitive price.** Reputations are built over long periods. This operational objective is about laying out the foundations for such a strong reputation. A coordinated communication effort among the key stakeholders of the sector will be required to build and promote among potential foreign clients the desired image. Environmental sustainability should be explored as a key component of the reputation.

An outstanding business environment eases the effort for entrepreneurs and investors, boosts firms' competitiveness, and lowers the cost of doing business in the country.

### 3. To train and retain the skills and competencies that the MRO sector requires.

Improving export competitiveness must go hand-in-hand with broad socio-economic development. This translates into ensuring that the benefits of export-led growth trickle down to the entire population. Particularly for the young and most vulnerable segments of the population. Fewer aviation experts are being trained in Ukraine every year. Those highly trained often migrate and prosper overseas.

This strategic objective targets skills and brain drain in the MRO sector. In the first place, the objective is to increase the number of young people trained in the aviation-related sector and to improve the quality of their training. Ensuring the right opportunities for these graduates in the local MRO sector is what this objective boils down to. In the longer run, the aim is to bring back some of the MRO and aviation experts currently working overseas.

At the operational level, there are the following objectives:

- **Improving the quality of the training in aviation-related fields.** The focus of this operational objective is to strengthen technical education in aviation. This includes education as well as certified training. MRO operators offering employment opportunities to young specialists and fresh university graduates could receive some benefits. The training dimension of the Strategy should also focus on enhancing the skills, knowledge, and competencies required to succeed in international markets;
- **Attracting young people to aviation-related education programmes and developing opportunities for expatriated Ukrainian talent.** For the sector to survive in the future, it is crucial to increase its capacity to attract students who want to develop a career in aviation. Women, in particular, are currently very underrepresented in the aviation domain. This includes both University training and Technical and Vocational Education and Training (TVET). This operational objective includes offering opportunities in the local MRO sector for expatriated Ukrainian talent and expertise. In the long run, growth hinges on the capacity to retain competencies and know-how locally. The expat talent attraction programme should focus on those areas that MRO operators and technical schools mostly demanded.

Ensuring inclusive economic growth is important so that all segments of the population benefit from it. This consists of promoting sustainable socio-economic development through more intensive and efficient use of the available human resources. This objective focuses on creating job opportunities for better-trained youth.

## ◇ Future value chain

### MRO Business Models

Several business models for MROs exist globally. The emergence of a model over another depends on a complex set of issues having to do with the relations of the sector with the authorities, taxation, investment, labor-related matters etc. The list below describes the existing models:

#### 1. The MRO is a Part of the Airline

a) Own airline only with limited full capacity work (American Airlines, United Airlines, Emirates); the MRO does the airline's maintenance work; the airline has full control of maintenance activities and most likely due to a large fleet has significant economies of scale by doing the work in-house.

b) Doing 3rd party work (Delta, AFI, KLM E&M): the MRO is a cost center and works on 3rd party aircraft. Any profit from the 3rd party work is used to reduce the airline's cost. These airlines use outsourcing (work that others can do more efficiently) to open up in-house capacity to bring in 3rd party work in areas that excel.

Ukraine has deviated from this model after Ukraine International Airlines has separated its MRO activities.

#### 2. The MRO is a 100% fully-owned subsidiary

a) Limited business focus – airline remains the primary customer (SIA Engineering company, Etihad Engineering, THY Technic are clear examples of this model). The airline has created

a sister MRO company that takes care of all maintenance work. While the MRO does all the maintenance, the airline remains to have the oversight.

b) Business focus (the airline is just another customer; for instance, Lufthansa Technik (LHT), a group of 28 companies able to make their own investment decisions). LHT has created a unique model through the creation of a solid 100% wholly owned MRO. LHT is the largest MRO in the world having facilities around the world and over \$5 billion in annual revenues.

This option remains open to Ukraine.

### **3. The MRO is a joint venture with an external partner**

A number of airlines have strong affiliations through long history with their MROs. The MROs either span-off from the airline or both companies were part of a larger group. Currently, the affiliated airline work is a small percentage of the total output. Some relevant examples include JorAmCo-RJ, HAECO-CX, TAECO/Xiamen.

This option remains open to Ukraine.

### **4. The MRO is independent**

In this model, the MRO operations are completely independent. Some relevant examples include ST Aerospace (Switzerland), AAR Corp. (USA), MRO Holdings/Aeroman (El Salvador).

This model is available to Ukraine.

### **5. OEM affiliated**

In this case, the provider of MRO services is affiliated with a manufacturer of original equipment. This is the case of Thailand/Airbus at U-Tapao for Thai Airways, Airbus at Sepang, Malaysia, India/Boeing at Nagpur for Air India.

Ukraine will have to choose among these options over the coming years. The opportunities for development and growth of volume of services (revenue) are different for each of four key segments A, B, C, D due to the following key drivers/factors/differences, applied/existed in each segment:

- Fleet size, structure, age, country of operation, certification system;
- Availability of spare parts and components, speed of obtaining customs clearance and export control permissions;
- Existing facilities in Ukraine and access to them;
- Lower labor rate compared to other Eastern Europe;
- Good technical university education in the aviation area and close engineering areas that generates candidates for further education for EASA certification.

### **Segment A «Western models - Non-Ukrainian operators»**

This is the most interesting segment due to its largest potential for growth. Situation and trends at the Global MRO market, combined with European, Eastern European and Middle East markets and related segments of the Air Transportation market, generates the following opportunities for growth of Ukrainian businesses:

**in Line maintenance** - growing Air transportation market enables a larger number of Non-Ukrainian airlines to conduct regular and charter operations in Ukraine. They will require local line staff and outsourcing various MRO services.

**in Heavy Maintenance and Modifications** - organize new and upgrade existing businesses that specialize on C-check and D-check services on Narrowbodies and later Widebodies, including painting.

**in Engines** - utilize historical heritage of Ukrainian aviation manufacturing of aviation engines and organize overhaul and repair of gas turbine engines (main and APUs).

**in Components** - similar to engines there are component design and manufacturing facilities in Ukraine (hydraulics, actuators, avionics, detectors, etc.) where overhaul and repair of Western components could be organized.



## Segment B «Non-Western models - Non-Ukrainian operators»

Fleets of aircrafts of non-Western models with Ukrainian registration and with foreign registration are different. The biggest fleet of aircrafts developed and manufactured in Ukraine (An models aircrafts and aircraft engines of Ivchenko-Progress manufactured by PJSC «Motor Sich») is located and operated in the Russian Federation, other former USSR countries and certain «third world» countries. Historically, their repair has been provided in Ukraine as well as in the Russian Federation at aircraft repair plants («ARP»).

Capabilities of Ukrainian ARPs greatly depend on the model and available solutions for their modernization made before the year 2014. After 2014 possibilities and capabilities of Ukrainian ARP in terms of provision of MRO services and modernization reduced drastically in part of manufacturers and developers located in Russia. Moreover, manufacturing of non-Western models was stopped long ago.

Growth of volume of MRO services and modernization for such aircrafts is unlikely. Moreover, there is strong competition with Russian ARPs due to better conditions of Russian ARPs in the context of obtaining spare parts and components from Russian OEMs.

## Segment C «Western models - Ukrainian operators»

This subsector has similar interest for growth due to the natural need of Ukrainian airlines as well as foreign operators to get a full and perfect package of MRO services and satisfy their growing need.

There are estimates that within five years Ukrainian Air Transportation Market will grow by 100%. Demand of MRO services will follow this trend.

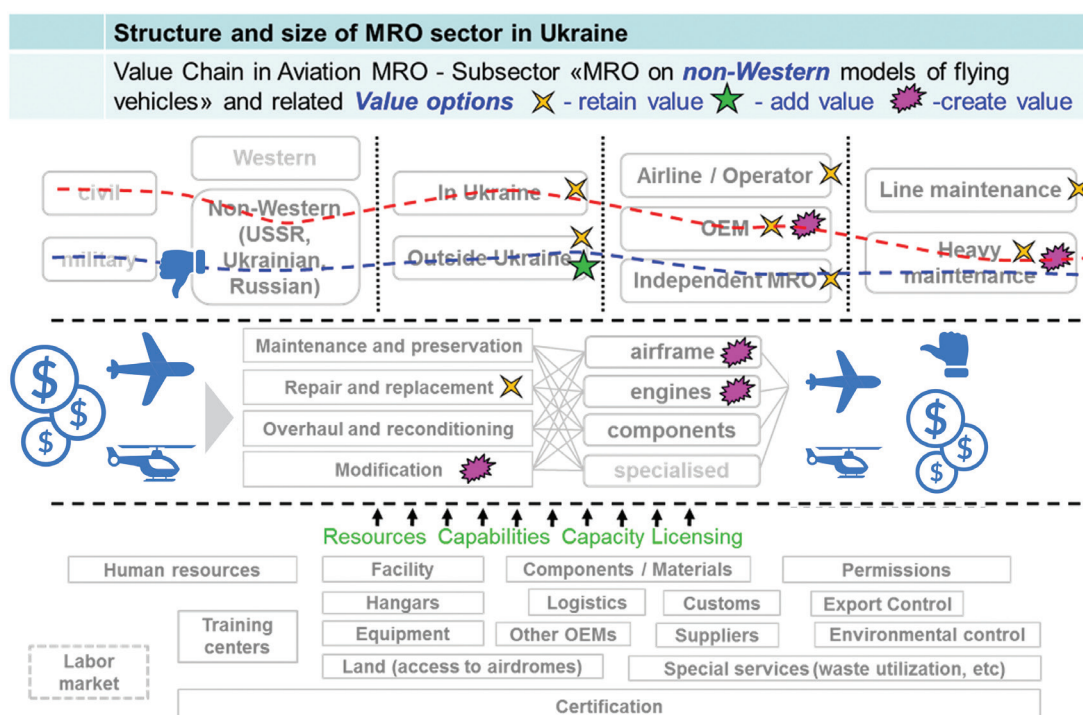
## Segment D «Non-Western models - Ukrainian operators»

The existing fleet of non-Western (other than Western countries) aircrafts has limited incentives to grow. However, there are plans and solutions aimed at re-launch of the serial production of An-148/158 for Ukrainian and international customers.

## Potential for growth

Non-Western fleet models have very limited potential for growth given the limited volume of services required. The main reason is the reduced fleet of airplanes and helicopters, both in and outside of Ukraine. Figure 20 shows the options available for non-Western models

Figure 20: Potential for growth for non-Western models

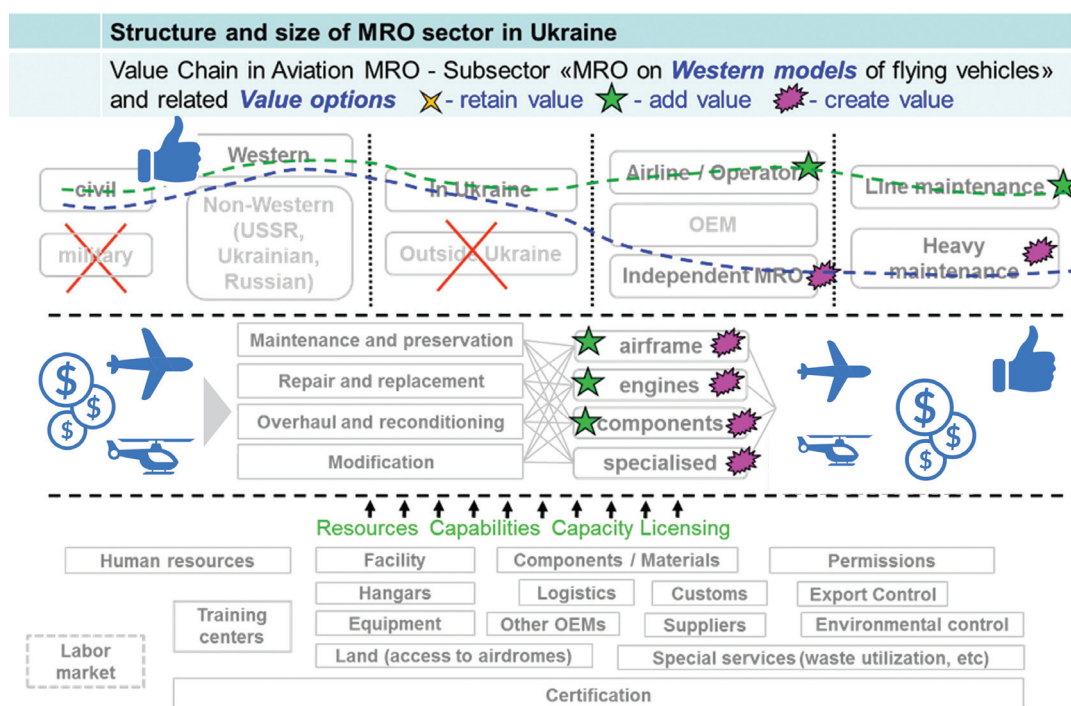


Source: National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.



For Western models, there is a large potential for growth of the volume of services. Figure 21 demonstrates options available for servicing Western models.

Figure 21: Potential for growth for Western models



Source National consultant of the Export Strategy for Aircraft Repair and Maintenance Sector 2019-2023.

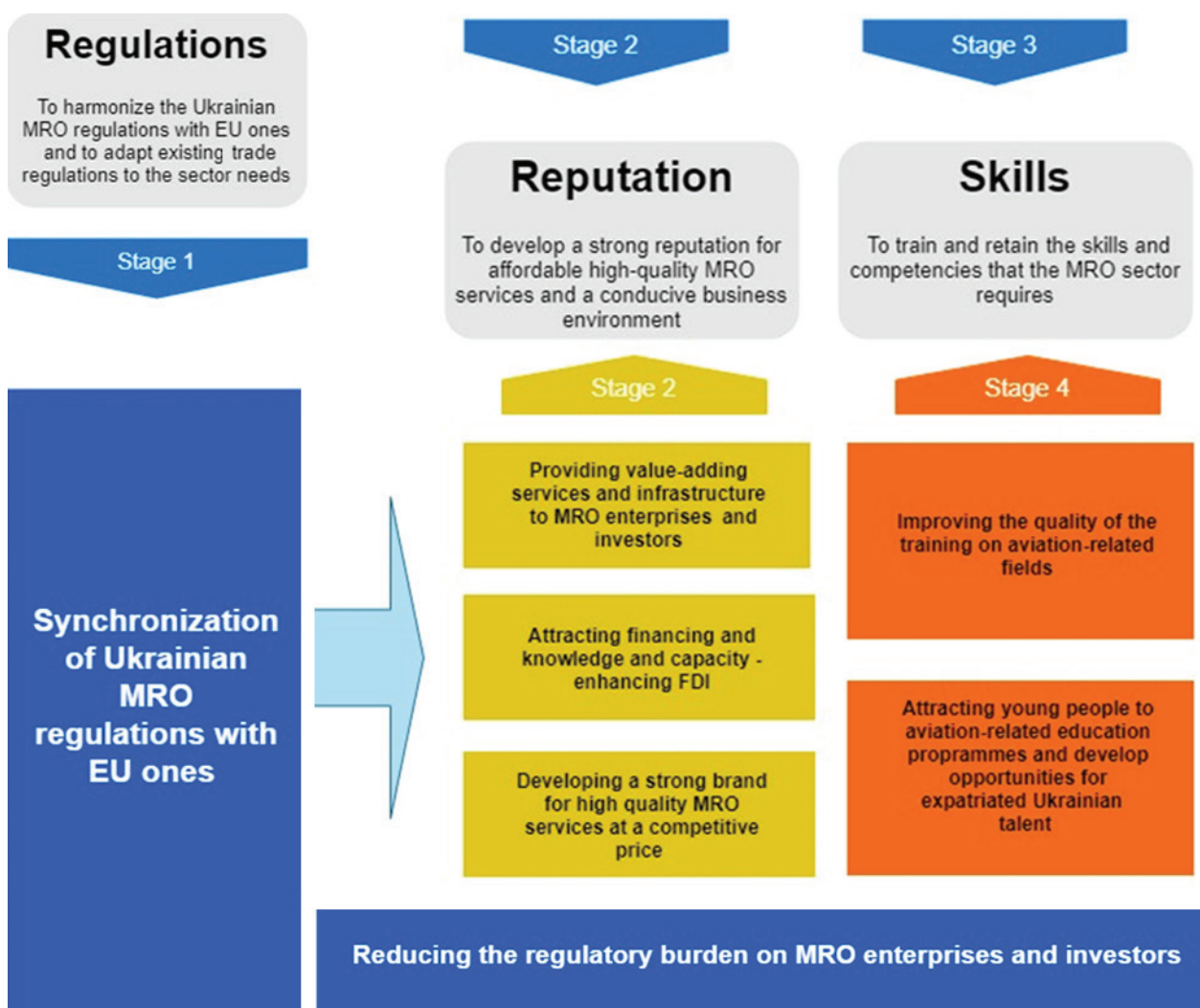
Given the large variety of MRO services that may be divided into several categories – part of aircraft (airframe, engine, components), place of services (line maintenance, heavy maintenance), type of provider (Airline, OEM, Independent Operator) there is a pool of business models available here.

### ◇ Development trajectory

From a strategic standpoint, the rationale for focusing on a particular set of objectives over others has a lot to do with the type of development process that the Strategy intends to trigger. In a way, the choice of objectives determines the type of developmental process that will follow. This is the reason why the objectives have taken into consideration not only the potential for trade expansion but also seek to have an impact on overall development areas such as stopping the brain drain and fostering intangible assets like the reputation of the country.

Figure 22 outlines the relation between the strategic and operational objectives. It also provides an overview of the sequencing of strategic actions. The first operational objective in Stage 1 is supposed to be implemented first and foremost. The remaining ones can happen in a more or less simultaneous manner. Let's review them in more detail below.

Figure 22: Logical framework of the roadmap



Source: ITC and Strategy stakeholder consultations, 2018

The first strategic objective is about the regulatory aspects of the MRO business. It is the first and most important pillar of the Strategy because without synchronization of the Ukrainian MRO regulations with the EU ones there cannot exist any meaningful MRO sector in Ukraine (at least not for Western models). Synchronization is a necessary condition. Without it, it is a "game over" situation.

But synchronization will not suffice. There are several other regulatory aspects that will need to be addressed to fix the business ecosystem and foster growth of the local MRO sector. These «fixes» (second operational objective) can happen overtime during the lifespan of the Strategy and beyond. This is why they have been depicted in blue underpinning the entire Strategy process.

Once the key regulatory aspects have been addressed, there are two strategic objectives that reinforce one another. They can be implemented even quite simultaneously. On the one hand, there is a reputational one. It intends to position the sector as the recipient of a long Ukrainian tradition in technical fields and airplane manufacturing. Other sectors in the Export Strategy of Ukraine, like the machinery sector, and beyond, will benefit from the activities under this objective.

But, on the other hand, reputation or branding alone will not suffice for export success. It has to be accompanied by top-of-the-range skills and know-how. This is precisely what the third objective intends to achieve by focusing on training and skills. A significant importance is attached to stopping Ukrainian expertise to move abroad and there are a number of recommendations to try to bring back some of the expertise that has left the country in the past.

Following the above logic, the strategic activities have been grouped around the three main clusters of the strategic objectives. Each strategic objective is further broken down into two or three more pragmatic or operational objectives.

## PLAN OF ACTION



Strategic Objective 1: To harmonize the Ukrainian MRO regulations with respective EU acquis and to adapt existing trade regulations to the needs of the sector.					
Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
1.1. Synchronization of Ukrainian MRO regulations with respective EU acquis.	<b>1.1.1. To develop a plan to synchronize with the EU acquis all relevant Ukrainian legislation and practices.</b>				
	1.1.1.1. Appoint a high ranking official responsible for enhancement of legislation revisiting.	Short term.	3Q 2019	4Q 2019	Ministry of Infrastructure of Ukraine («Mininfrastructure»), SAAU
	1.1.1.2. Develop an inventory of all the required procedures that need to be changed. The inventory needs to disclose in a transparent manner the past (completed), and ongoing plans and projects that are relevant to the synchronization of regulation of Ukraine to the EU. Preparation of a Plan of synchronization and its annual upgrade.	Short term, Inventory of the regulatory framework that will be harmonized with the EU legislation and will impact MRO activities completed.	4Q 2019	1Q 2020	Mininfrastructure, SAAU
	1.1.1.3. Placement of updated Harmonization Plans or information on such Plans (links) that are the responsibility of the relevant government agencies on the SAAU website.	Medium-term.	2Q 2020	4Q 2023	SAAU
	1.1.1.4. Actualization of the state of implementation of harmonization measures (status of execution, terms, delays, reasons, counter-measures).	Medium-term, Relevant plans and changes approved.	1Q 2021	1Q 2023	SAAU
	1.1.1.5. Amend the Air Code of Ukraine to provide an adequate legal status to state MRO services providers.	Medium-term.	1Q 2021	4Q 2023	SAAU, Minsfrastructure
	This activity aims to synchronize the Ukrainian legislation with the EU one within aviation-related areas by updating the existing Plan on harmonization of the Ukrainian aviation legislation (in terms of measures that impact SAAU activities).				
	<b>1.1.2. To ensure that locally produced spare parts and components comply with international technical regulations and widely accepted standards for aviation products.</b>				
	1.1.2.1 Seek an international certification for the Ukrainian certification body.	Medium-term.	2Q 2020	4Q 2023	Mininfrastructure, SAAU
	1.1.2.2. Update and translate to English all aviation-related legislation.	Ongoing.	3Q 2019	4Q 2023	Mininfrastructure, SAAU
	1.1.2.3. Boost the local production of products that are certified for the MRO sector to use them.	Medium-term.	1Q 2020	4Q 2023	MFU, local authorities
	1.1.2.4. Provision of recognition of Ukrainian certificates of manufacturers of aviation products (components, materials) by EASA.	Medium-term.	1Q 2020	4Q 2023	SAAU, Mininfrastructure
	1.1.2.5. Provide incentives to the machine-building and chemical companies to produce certified products in the country that can be used by the MRO sector as inputs.	Medium-term.	1Q 2020	4Q 2023	MEDT, MFU, AAUCA
	This activity aims at upgrading the certified quality of the national inputs for the MRO sector.				

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	<b>1.1.3. Ukraine to obtain EASA membership.</b>				
	1.1.3.1. Start negotiations with the EASA and EU authorities for Ukraine to reach the same status as other non-EU members such as Switzerland, Norway or Liechtenstein.	Short term.	1Q 2020	2Q 2020	Ministry of Foreign Affairs («MFA»), Mininfrastructure
	1.1.3.2. Development of a Plan to implement measures aimed at obtaining by Ukraine of the status similar to status Switzerland, Norway and Liechtenstein in the context of aviation legislation.	Short term. Plan to implement all the necessary changes agreed with EASA.	2Q 2020	3Q 2020	MFA, Mininfrastructure
	1.1.3.3 Conclude negotiations with the EASA and EU authorities aimed at obtaining by Ukraine of the same status as other non-EU members such as Switzerland, Norway or Liechtenstein.	Long term, Plan to implement all the necessary changes and accession date agreed with EASA.	4Q 2020	4Q 2023	MFA, Mininfrastructure
	1.1.3.4. Provide visibility to the Project EASA-SAAU 2017-2020 with the convergence of aviation laws and Ukraine and the EU by creating a project page on the SAAU website.	Short term, Publication of the Project draft, project documents, information on project activities, project results, current reports on the implementation of the Project on the SAAU website.	3Q 2019	4Q 2020	Government Office for Coordination on European and Euro-Atlantic Integration, SAAU
	This activity aims at alignment Ukrainian legislation with the EU acquis in order to ensure the level of EU associated countries.				
	<b>1.1.4. Amendments to Ukrainian aviation legislation on matters related to MRO in accordance with ICAO recommendations.</b>				
	1.1.4.1. Development of changes in the regulatory framework of Ukraine for the implementation of amendments from the ICAO.	Medium-term.	3Q 2019	4Q 2023	Mininfrastructure, SAAU, AAUCA (upon agreement)
	1.1.4.2. Engage air transportation market participants in working out amendments.	Ongoing.	3Q 2019	4Q 2023	Mininfrastructure, SAAU, AAUCA (upon agreement)
	1.1.4.3. Publishing revisited statutory documents at SAAU website.	Ongoing.	3Q 2019	4Q 2023	SAAU
	This activity aims to incorporate ICAO's recommended changes to Ukrainian legislation.				
	<b>1.1.5. To improve efficiency and transparency of customs by streamlining procedures, reducing compliance costs and transit times. In particular for goods of dual-use.</b>				
	1.1.5.1. Simplify customs procedures for dual-use spare parts and components used by MRO providers (components used for repair of civil aircraft). Annulment (similar to certain European countries) of the requirement to obtain permits for dual-use products.	Short term, Allow enterprises that handle state defence orders to import dual-use goods (spare parts for civil aircraft) without obtaining permits from the State Service of Export Control of Ukraine.	4Q 2019	4Q 2020	MEDT, Mininfrastructure, State Fiscal Service (SFS), State Customs Service («SCS»), State Service of Export Control of Ukraine («SSEC»)

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	1.1.5.2. Simplify customs clearance procedures on spare parts and components for civil aircraft. This task envisages shorter procedures on obtaining permits for the spare parts and components which are currently viewed as dual-use products, however, used in civil aviation.	Short term. Incorporation of the expedited procedure (at a higher fare) for obtaining cross-border permits for dual-use products aimed for civil aircraft.	1Q 2020	4Q 2020	SFS, SCS
	1.1.5.3. Identify all the trade-related transactions that can take place online and implement an electronic single-window for all export, import, and transit procedures and formalities. This includes setting up a 24/7 online portal linked to an e-tracking system that allows MRO operators tracking their shipments in real-time. The Customs office will have to be equipped with the required IT systems and be capable to operate in a single-window environment and to process payments online.	Medium-term. Implementation of the system of electronic licensing in the field of export control. Developing the Plan for the implementation of the system and its publication on the website of the State Service of Export Control of Ukraine.	1Q 2020	4Q 2023	Ministry of Finance of Ukraine («MFU»), SCS, SSEC
	1.1.5.4. Identify the export, import, and transit procedures and formalities that cannot be implemented online in a straightforward manner and to develop a plan to streamline them. It can be done, for example, by reducing the paperwork involved in clearing goods or minimizing physical inspections.	Short term. Conduct annual surveys of market players engaged in exports in the aviation sector, evaluation of activities, publication of statistics and actual requirements to be met for obtaining permits.	1Q 2020	4Q 2020	MEDT, Mininfrastructure, SCS, AAUCA
	1.1.5.5. Hold regular consultations among SCS, SSEC and MRO operators to develop joint initiatives. The purpose of these consultations is to reach a common understanding of the real needs of all parties involved and to come up with joint proposals and funding priorities addressed to the government.	Medium-term. Regular update of the SSEC website (information about this project must be made public, the project must be carried out transparently and quickly).	4Q 2019	4Q 2023	SCS, State Service of Export Control of Ukraine (SSEC), AAUCA
	1.1.5.6. Improve transparency, specifications and accountability of SSEC and to establish a customs helpdesk with a hotline staffed with adequately trained personnel who can assist trading MRO operators in preparation of customs clearance forms. Regular update of the state export policy (in accordance with the Matters Referred to the Competence of the Ministry of Economic Development, Trade and Agriculture of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine dated 8 August 2014 No. 459) and its publication at the websites of MEDT and SSEC.	Short term. The publication of the tasks and priorities of the SSEC for the period 2017-2019 and the subsequent periods approved by the MEDT at the websites of the MEDT and SSEC.	1Q 2020	4Q 2020	MEDT, SSEC, SFS, SCS
	1.1.5.7. Develop an incentive scheme for customs in order to enhance their efficiency. For example, salary may partially depend on efficiency in terms of customs clearance.	Medium-term.	1Q 2020	4Q 2021	SCS

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	1.1.5.8. Allow the temporary import/export of dual-use goods for repair services in the framework of the guarantee maintenance without the SSEC permit provided the SSEC previously authorized these products for their export to countries without restrictions (defined by the UN Security Council resolutions and international export regimes control).	Medium-term.	4Q 2019	4Q 2020	MEDT, SSEC
	1.1.5.9. Allow enterprises that handle a state defence order to import dual-use goods (spare parts for civilian aircrafts ) without obtaining SSEC permits.	Short term.	4Q 2019	1Q 2020	MEDT, SSEC
	This activity aims at reducing the cost and the time of exporting and importing by MRO operators and to simplify the cross-border procedures for granting permits for dual-use goods and services.				
1.2. Reducing the regulatory and administrative burden on MRO enterprises and investors.	<b>1.2.1. To review and adapt the tariff policies and practices that impact MRO services.</b>				
	1.2.1.1. Raise awareness among the policymakers in charge of negotiating trade agreements and tariff matters on the context of the aviation-related sectors.	Medium-term.	4Q 2019	4Q 2023	Mininfrastructure, MEDT, AAUCA
	1.2.1.2. Ensure that representatives of the MRO sector can take part in trade-related negotiations or at least find a structured two-way communication mechanism that allows negotiators using the industry inputs.	Medium-term.	4Q 2019	4Q 2023	Mininfrastructure, MFA, AAUCA
	1.2.1.3. Establish a plan to gradually reduce customs duties on imported inputs for the MRO sector over the next five years.	Short term. Technological equipment imported to the territory of Ukraine to provide services is VAT exempted.	4Q 2019	1Q 2020	Mininfrastructure, MEDT, MFU
	1.2.1.4. Eliminate existing qualitative restrictions applicable to the amount of inputs for the MRO sector that can be imported.	Medium-term.	4Q 2019	4Q 2020	Mininfrastructure, MEDT, MFU
	1.2.1.5. Create free economic zones next to international airports.	Medium-term.	4Q 2019	4Q 2023	Mininfrastructure, MEDT, MFU
	This activity aims at reducing tariffs payable by MRO operators to import key inputs.				
	<b>1.2.2. To reduce the border compliance costs for importing/exporting MRO operators.</b>				
	1.2.2.1. Revise the existing legal requirements to import/export of components by excluding goods of dual-use used for civil aviation.	Short term.	1Q 2020	4Q 2020	MEDT, MFU, SFS, SSEC
	1.2.2.2. Reduce the list of products that are subject to export control, exclude those products which are clearly for civil aircrafts.	Short term.	1Q 2020	4Q 2020	MEDT, MFU, SFS, SSEC
	1.2.2.3. Simplify export control procedures to make these less time and money consuming for the MRO operators.	Short term.	1Q 2020	4Q 2020	MEDT, SSEC
	1.2.2.4. Adapt existing regulations for state authorities to enable recognition of EASA and FAA certificates issued for dangerous goods.	Short term.	1Q 2020	4Q 2020	Ministry of Energy and Environmental Protection of Ukraine «Mineco», SAAU, State Emergency Service of Ukraine («SES»)
	1.2.2.5. Elaborate new mechanism for simplifying procedures of permits issued for components used for MRO emergencies.	Short term.	1Q 2020	4Q 2020	MEDT, SAAU
	This activity aims at reducing the key expenditures and strengthening the competitiveness of Ukrainian exports.				



Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	<b>1.2.3. To enhance participation of MRO members in associations or industrial unions.</b>				
	1.2.3.1. Prepare a proposal to the AAUCA with respect to the establishment of MRO Committee and to attract new AAUCA members engaged in MRO activities.	Short term.	3Q 2019	4Q 2019	MEDT, Mininfrastructure
	1.2.3.2. Develop procedures, measures attracting new members-MRO sector companies (airlines and MRO providers).	Short term.	4Q 2019	1Q 2020	AAUCA (upon agreement)
	1.2.3.3. Develop the AAUCA Action Plan in the field of MRO.	Short term.	1Q 2020	1Q 2020	AAUCA, Mininfrastructure, MEDT
	1.2.3.4. Implement the AAUCA Action Plan in the field of MRO.	Medium-term.	2Q 2020	4Q 2023	AAUCA (upon agreement)
	1.2.3.5. Study the best international practices of sectoral associations/unions and introduce appropriate measures in Ukraine.	Medium-term.	2Q 2020	4Q 2021	AAUCA (upon agreement), Mininfrastructure
The goal of this activity – MRO sector companies speak in one voice when communicating with the state authorities.					
<b>Strategic Objective 2: To develop a strong reputation for affordable, high-quality MRO services and a conducive business environment.</b>					
2.1. Providing value-adding services and infrastructure to MRO enterprises and investors.	<b>2.1.1. To improve the statistical capacity of the state institutions by regularly collecting and analysing relevant firm-level data.</b>				
	2.1.1.1. Explore the establishment of the sector-specific body that could process statistics on MRO activities. A model could envisage analysis of statistical data submitted by sector participants under confidentiality condition, as well as providing anonymous feedback to sector participants.	Short term.	1Q 2020	2Q 2020	SAAU, Mininfrastructure, AAUCA (upon agreement), State Statistics Service of Ukraine («SSS»)
	2.1.1.2. Development of a data collection system covering all MRO-related aspects. Establishment of a data collection system (e.g. filling in online forms, etc.).	Short term.	1Q 2020	2Q 2020	MEDT, Mininfrastructure, SAAU, AAUCA
	2.1.1.3. Enhancing trustworthy relations between the state and MRO aimed at exchanging information among MRO operators and state bodies. Raise awareness among the firms on the importance of providing statistical data.	Ongoing.	1Q 2020	4Q 2023	MEDT, Mininfrastructure, SAAU, AAUCA
	2.1.1.4. Organise annual events to present and discuss the results of the analysis of the available data on the MRO sector and invite all interested stakeholders.	Annually.	1Q 2020	4Q 2023	Mininfrastructure, SAAU, AAUCA
	2.1.1.5. Publish annual statistics on MRO sector on the governmental website.	Annually.	1Q 2021	1Q 2023	Mininfrastructure, SSS
	This activity intends to enhance policymakers' understanding of the strengths and weakness of the MRO sector. Policymakers will be able to design their export promotion and firm-level support programmes and services better and use the results to make evidence-based policy decisions.				
	<b>2.1.2. To increase the local sourcing of inputs by creating new linkages among the different economic sectors and strengthening the existing ones.</b>				
	2.1.2.1. Promote and strengthen the existing ties between local suppliers and top MRO operators. Work with international companies operating in Ukraine to increase local sourcing for their global operations.	Medium-term.	1Q 2020	4Q 2023	AAUCA, Export promotion office of Ukraine, UkraineInvest
	2.1.2.2. Create new ties between potential local suppliers of parts and components and the MRO operators. Analyze incentives for local sourcing of certain types of components necessary for the MRO value chain.	Medium-term.	1Q 2020	4Q 2023	AAUCA, MEDT

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	2.1.2.3. Organize joint events with the participants of MRO adjacent sectors dedicated to localization of manufacturing of MRO components and materials.	Medium-term.	1Q 2020	4Q 2023	AAUCA, MEDT
	2.1.2.4. Organize networking events and factory visits between potential local suppliers of products and services and MRO operators. Explore and develop opportunities for joint ventures among producers with complementary offerings. Develop a pilot programme.	Medium-term.	1Q 2020	4Q 2023	AAUCA, UkraineInvest
	2.1.2.5. Make international investors aware of potential opportunities for joint ventures in Ukraine.	Medium-term.	1Q 2020	4Q 2023	AAUCA, UkraineInvest
	This activity aims at creating domestic clusters on aircraft parts, components and services. Developing the country's industries, which produce inputs for the MRO is crucial for the long-term development of the sector.				
	<b>2.1.3. To improve waste management by raising awareness on the matter and ensuring that the appropriate legislation is in place.</b>				
	2.1.3.1. Review and update the existing legislation on waste management. Effective legislation does not work in practice with reference to its complexity.	Short term.	1Q 2020	2Q 2020	Mineco, State Ecological Inspection of Ukraine («SEI»), AAUCA
	2.1.3.2. Develop new legislation to adapt to more stringent environmental regulations for the aviation sector that are expected to resolve deficiencies of the effective legal framework in the context of physical disposal of chemical waste of painting aircrafts.	Short term, Simplify certification process for components containing dangerous substances if these components have EASA/FAA certificates.	2Q 2020	4Q 2020	Mineco, SAAU, AAUCA
	2.1.3.3. Review and update the effective legislation related to discharge (fuel and oils), temporary storage and refuelling aircrafts which undergo MRO.	Short term.	1Q 2020	4Q 2020	SAAU, Mineco, SEI
	2.1.3.4. Voluntarily adopt high environmental standard for the entire MRO sector to enhance reuse and recycle and reduce waste generated by MRO activities (e.g., old paint, liquids, etc.).	Medium-term.	1Q 2020	4Q 2023	SEI, Mineco
	2.1.3.5. Develop an innovation programme dedicated to reuse and recycle of the waste generated by MRO. The programme should aim at reducing the disposal or incineration of waste by ensuring maximum reuse and recycle.	Short term.	1Q 2021	2Q 2021	SEI, Mineco, SAAU
	2.1.3.6. Allocate a special area (a polygon) to process MRO subproducts and waste.	Short term.	1Q 2021	4Q 2021	SEI, Mineco
	The impact of this economic activity on the environment can be quite significant if not properly controlled. This activity aims at raising awareness among MRO operators, legislators and enhancement of the environmental programs to position the sector and its competitive advantages.				
	<b>2.1.4. To raise awareness among MRO operators of the existing trade-related support services and improve the effectiveness of business promotion activities in the aviation and MRO sectors.</b>				
	2.1.4.1. Develop an exhaustive directory of the agencies and government bodies with aviation and MRO related functions.	Short term.	3Q 2019	4Q 2019	AAUCA
	2.1.4.2. Survey MRO operators on their perception of the quality of the specific trade-related support services on offer. Use the results to develop an ambitious reform agenda to avoid duplications and service gaps.	Annually.	4Q 2019	4Q 2023	Export promotion office of Ukraine, AAUCA



Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	2.1.4.3. Extend the same level of business support services currently provided to large MRO companies (such as SE «Antonov» and PJSC «Motor Sich») to all firms.	Medium-term.	1Q 2020	4Q 2021	Mininfrastructure, MEDT
	2.1.4.4. Develop an online platform that collects and disseminates information about scheduled business support events for the MRO.	Short term.	1Q 2021	4Q 2021	MEDT, Mininfrastructure, AAUCA
	2.1.4.5. Organize seminars for MRO services providers between the service providers and the MRO sector stakeholders to discuss the adequacy of existing export support programmes.	Annually.	1Q 2020	4Q 2023	Export promotion office of Ukraine, AAUCA
	2.1.4.6. Design and implement an effective communications platform to facilitate dialogue between stakeholders and keep them apprised of trade development opportunities.	Medium term.	1Q 2020	4Q 2023	Export promotion office of Ukraine, AAUCA
	This activity intends to raise awareness on underused export promotion services and provide access to the smaller enterprises to support services similar to the ones provided to the large companies such as SE «Antonov» and PJSC «Motor Sich».				
	<b>2.1.5. To eliminate inefficiencies in the long-term management, allotment and use of the land around airports.</b>				
	2.1.5.1. Analysis of the experience of other countries in using the land around airports and mechanisms for their involvement in commercial use for the provision of services.	Short term.	1Q 2020	2Q 2020	MEDT, Mininfrastructure, State Property Fund of Ukraine («SPF»), Local authorities (administrations, self-governments)
	2.1.5.2. Make an inventory of high buildings in areas neighbouring flying paths and airports.	Short term.	1Q 2020	4Q 2020	Mininfrastructure, SAAU, Ukrainian State Air Traffic Services Enterprise («UkrSATSE»), Local authorities (administrations, self-governments)
	2.1.5.3. Effective planning. Allot a land around the airport for new MRO infrastructure projects, including hangars, warehouses, etc.	Medium-term, Determination of sites and conditions of their intended use for MRO infrastructural projects under long-term lease, which shall subject to the competitive bids.	1Q 2020	4Q 2023	Mininfrastructure, SAAU, UkrSATSE, Local authorities (administrations, self-governments)
	2.1.5.4. Create awareness of local officials on the impact of these actions on the future of the MRO and how they impact employment and growth opportunities.	Medium-term.	1Q 2020	4Q 2023	Mininfrastructure, AAUCA

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	2.1.5.5. Ensure that cities that have masterplans for their land around airports allocate space to develop MRO operations in the long term.	Medium-term, Formation and approval of the Programme for the lease of designated land plots on a competitive basis exclusively with the intended purpose for the construction of hangars for MRO.	1Q 2020	4Q 2023	Ministry of Communities and Territories Development of Ukraine, State Architectural and Construction Inspectorate of Ukraine, SPF, Mininfrastructure, Local authorities (administrations, self-governments)
	2.1.5.6. Eliminate unplanned settlements. Prevent allotment of land (close to the airports) for private use.	Medium-term, Inventory of land around the perimeter of airfields and a national analysis of its use.	1Q 2021	4Q 2023	MEDT, Mininfrastructure
	These means are aimed against inappropriate use and management of the land around airports that creates a problem for the development of the existing MRO operations.				
2.2. Attracting financing and knowledge and capacity through enhancing foreign direct investment in the aviation and MRO sector.	<b>2.2.1. To facilitate access to affordable and adequate infrastructure in the areas near airports by attracting investment.</b>				
	2.2.1.1. Simplify the existing procedures pertaining to the execution of the long-term lease agreements for the MRO operators by reviewing the current demand for guarantees.	Medium-term.	1Q 2021	4Q 2023	Mininfrastructure, SPF, local authorities - Airport owners, UkraineInvest
	2.2.1.2. Develop a legal mechanism (including issues of land ownership) for local or foreign investors to come to build hangars around the airports.	Medium-term.	1Q 2020	4Q 2021	Mineco, Local authorities (administrations, self-governments)
	2.2.1.3. Attract national and foreign long-term investors through incentive schemes to build new facilities around the airports.	Medium-term.	1Q 2021	4Q 2023	UkraineInvest, Mininfrastructure, Local authorities (administrations, self-governments)
	This activity aims to eliminate inefficiencies in the long-term management, allotment and use of the land around airports.				
	<b>2.2.2. To strengthen capacity to attract new investments by pursuing a proactive strategy.</b>				
	2.2.2.1. Reduce the processing time of investment proposals by streamlining the reviewing procedures.	Short term.	1Q 2020	4Q 2020	MEDT, MFU
	2.2.2.2. Provide incentives (fiscal or otherwise) to investors that improve the competitiveness of the MRO sector.	Short term.	1Q 2020	4Q 2020	MEDT, Mininfrastructure, UkraineInvest
	2.2.2.3. Set up a single entry point («single window») to deal with each investment proposal received and allocate responsibilities to ensure that investment proposals receive immediate attention.	Short term.	1Q 2021	4Q 2021	MEDT

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	2.2.2.4. Create the state-private partnership mechanism for attracting experienced specialists that will implement innovations in the aviation industry.	Medium-term, Information work towards building image and promoting Ukrainian MRO sector among MRO specialists who left the country.	1Q 2020	4Q 2023	MEDT, Mininfrastructure, UkraineInvest
	This activity aims at attracting more investment from existing investors and, as well as attracting new investors.				
2.3. Developing a strong brand for high-quality MRO services at a competitive price.	<b>2.3.1. To develop a brand for high value-added Ukrainian goods and services.</b>				
	2.3.1.1. Develop the MRO marketing plan for the key MRO customers.	Short term. Annual poll of participants in the sector, partners and customers of the MRO. Estimation of the image of the Ukrainian sector of the MRO. Placing information on the AAUCA website.	3Q 2020	4Q 2020	AAUCA, Mininfrastructure, SAAU
	2.3.1.2. Promote the sector development strategy on target markets.	Medium-term, MRO Presentation of the Strategy at the Annual Industry Conference of Air Traffic Safety in Eastern Europe MRO Europe 21-22 October 2019, 16-17 October 2019, London, Aero-Engines Europe 12-13 September 2019, Hamburg, etc.	3Q 2019	4Q 2023	AAUCA, Reforms Delivery Office of the Cabinet of Ministers of Ukraine, MEDT
	2.3.1.3. Develop an international promotion campaign to create a positive image of Ukrainian high-value products and services. Prepare a presentation to promote the MRO sector through fairs and conferences Le Bourget-2021 and Farnborough-2020. Bourget - 23 and Farnborough - 2022.	Medium-term.	1Q 2020	4Q 2023	AAUCA, Reforms Delivery Office of the Cabinet of Ministers of Ukraine, MEDT
	2.3.1.4. Promote the brand in target export markets.	Medium-term, EXPO 2020.	1Q 2020	4Q 2023	Ministry of Foreign Affairs («MFA»), MEDT, AAUCA
	2.3.1.5. Creation of a mechanism for an independent assessment of the image and activities of the MRO sector in Ukraine.	Short term, annual independent survey.	1Q 2020	4Q 2020	MEDT, AAUCA

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	2.3.1.6. Holding an annual MRO conference in Eastern Europe (MRO BEER) in 2021 or 2022.	Medium-term, establishment of MRO BEER Committee (if decided in favour thereof).	1Q 2020	2Q 2022	AAUCA, Mininfrastructure, MEDT
	This activity aims at projecting a positive image of the Ukrainian high value-added goods and services. This activity is linked to the Export Strategy for the Machinery Sector.				
Strategic Objective 3: To train and retain the skills and competencies that the MRO sector requires.					
3.1. Improving the quality of the training on aviation-related fields.	3.1.1. To bridge the existing skills gaps by reforming the parts of the Technical and Vocational Education and Training («TVET») and University system that are aviation-related.				
	3.1.1.1. Review the current TVET offering on aviation-related areas. Involve the MRO operators on the development of a new TVET system that is better aligned to the real needs of the firms.	Long term. Kick-off meeting and an agenda for the following meetings.	1Q 2020	4Q 2023	Ministry of Education and Science of Ukraine («MES»), specialised Higher Educational Institutions («HEIs»), AAUCA
	3.1.1.2. Develop opportunities for aviation students to gain practical experience through apprenticeship during their studies in terms of the introduction of dual education.	Medium-term. Identification of «white stains». Annual Meeting of Airlines and MRO Providers to identify knowledge and skills that need improvement in the learning process.	1Q 2020	4Q 2023	MES, HEIs, AAUCA, selected MRO participants (upon agreement)
	3.1.1.3. Employ multiple pathways for persons to receive skills certification, including, recognition of prior learning, dual education, and workplace assessments. Development the regulatory documents. Cooperation with the Ministry of Education and Science of Ukraine and higher educational institutions («HEIs») for the introduction of dual education in the specialities that are used in the MRO sector.	Medium-term.	1Q 2020	4Q 2023	MES, HEIs, AAUCA, selected MRO participants (upon agreement)
	3.1.1.4 Develop and execute an advocacy plan for TVET training to include stakeholder engagements, media activities and targeted surveys and implement mechanisms to obtain, analyse, store and share labour market intelligence.	Medium-term.	1Q 2020	4Q 2023	MES, HEIs, AAUCA, selected MRO participants (upon agreement)
	3.1.1.5. Regularly monitor and evaluate all the elements of the TVET training delivery system to ensure quality and standards compliance (employments opportunities for graduates, meeting private sector requirements, etc.).	Medium-term. Engaging best students to take courses on MRO-related professions (including dual education programs).	1Q 2021	4Q 2023	MES, HEIs, AAUCA

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	3.1.1.6. Assist MRO operators in developing a structured training program for their employees and the acquisition of training materials and professional trainers. Identify education demands; provide guidelines to arrange training at the workplace.	Medium-term. Finding partners in Western and Eastern Europe who carry out certified MRO training for joint projects in Ukraine.	1Q 2020	4Q 2023	HEIs, SAAU, AAUCA
	3.1.1.7. Creation of a «Platform for the development of solutions to meet the needs of MRO services providers» for engaging students to the higher educational institutions in terms of diploma projects, thematic research projects.	Medium-term. Profile higher educational institutions for the MRO sector.	1Q 2021	4Q 2021	HEIs, AAUCA, selected MRO participants (upon agreement)
	This activity aims at the development of dual education in areas related to MRO and at providing the basis for the development of the educational infrastructure including TVET and tertiary education in order to cater the needs of the aviation and MRO sectors.				
	<b>3.1.2. To ensure a coherent and relevant offering of training on relevant business management skills directed to personnel of MRO operators.</b>				
	3.1.2.1. Map out the current educational offers on business management, find gaps, duplications and conduct a quality benchmarking exercise against international best practices.	Medium-term.	1Q 2020	4Q 2023	MES, MEDT, HEIs, AAUCA
	3.1.2.2. Develop a joint programme among MRO operators, the educational institutions, and the public sector to strengthen the weak areas and fill the existing gaps identified. Some preliminarily identified areas include the following: financial and quality management, local sourcing, English language, performance monitoring, information systems, international marketing, contract negotiating skills and international trade.	Short term.	1Q 2020	2Q 2020	MES, MEDT, Mininfrastructure, AAUCA with HEIs, selected MRO companies
	3.1.2.3. Survey local firms identify the skills that are not sufficiently available.	Annually.	4Q 2019	4Q 2023	AAUCA, MES
	3.1.2.4. Conducting specialised training to MRO operators on actual topics and issues that appear in the industry and sector.	Medium-term.	1Q 2020	4Q 2023	AAUCA, MES, HEIs, Mininfrastructure
	This activity aims at strengthening the training on business management skills and generating a pool of expertise and skills in crucial areas that MRO firms require for their development.				
	<b>3.2.1. To enroll young adults in educational programs developed for aviation specialists.</b>				
	3.2.1.1. Development and implementation of measures aimed at informing potential students on the prospects of obtaining a technical degree in MRO sector, including excursions to MRO facilities, lectures and films screening in educational institutions, receptions and presentations organized by MRO facilities, arranging for public speeches of MRO specialists. Special attention shall be paid to students of 9 <sup>th</sup> and 11 <sup>th</sup> grades and their parents.	Short-term; ongoing.	1Q 2020	4Q 2023	AAUCA together with higher educational institutions and vocational institutions, MES
	3.2.1.2. Priority shall be given to the introduction of dual education under the professions, which meet the demands of the MRO sector; priority regions - location of MRO facilities.	Mid-term.	1Q 2020	4Q 2023	MES together with higher educational institutions and vocational institutions (upon consent), AAUCA
These measures aim at informing young adults and potential students on the advantages of aviation and MRO professions and education.					

Operational objective	Activity	Implementation target and timeframe	Start	Complete	Executing agency
	<b>3.2.2. inform Ukrainian MRO specialists working abroad on the improved work offering in Ukraine.</b>				
	3.2.2.1. To compile information database of MRO specialists and regularly update the same.	Short-term; ongoing.	2Q 2020	4Q 2023	AAUCA together with MRO sector players, SAAU (upon consent)
	3.2.2.2. To develop a separate web-page on the web site of a specialized MRO association, as well as a web-page specifically dedicated to MRO specialists.	Mid-term.	3Q 2020	4Q 2020	AAUCA together with MRO sector players (upon consent), Mininfrastructure
	3.2.2.3. To conduct annual surveys of MRO specialists working abroad (in terms of the annual survey conducted among the MRO sector specialists) and inquire into the conditions of their return to Ukraine. Answers shall be analyzed; respective findings and recommendations shall be included in the general annual report on the sector development and the status of the Action plan implementation.	Annually.	4Q 2020	4Q 2023	AAUCA, MEDT, Mininfrastructure
These measures aim at informing MRO specialists working abroad on the well-paid job offerings in Ukraine to encourage their returning to Ukraine.					



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