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Prospects for the use of unmanned aircraft in the Ukrainian economy

The market for the use of unmanned aircraft in various sectors of the Ukrainian economy is analyzed: agriculture; forestry; oil industry; in the sectors of the economy associated with the mining business and others. It was found that one of the reasons for the unsatisfactory state of the services market with the use of unmanned aircrafts is the lack or imperfection of the legislative and regulatory framework for the use of unmanned aircrafts

Today, there are a number of tasks in which the presence of a person on board an aircraft is absolutely unnecessary. Therefore, in various sectors of the economy, unmanned aircrafts are increasingly used.

The most popular unmanned aircrafts are in agriculture. Here they are used for operative monitoring of the state of crops, drawing up a precise map of the fields taking into account the relief for further use in geoinformation systems, and for constructing agricultural machinery routes. Modern technologies of crop monitoring allow farmers to apply fertilizers and plant protection products precisely to those areas where this is really necessary [1].

For example, according to the authors of the AeroDrone project, three unmanned aircrafts per day are capable of processing 1500 hectares of land, and the cost of processing one hectare is \$ 10, while processing fields using standard aviation type AN-2 is about \$ 10-15 + cost of fuel consumed. In addition, when using the unmanned aircrafts, it is possible to use ultra-low-volume spraying technology, when water is practically not used, this provides a significant saving in processing, compared to a standard sprayer, where the average water flow rate is 200 liters / ha on average.

In addition, unmanned aircrafts are used:

- in forestry for the classification and inventory of forests, estimates of such important indicators as average height of trees, their number, density of planting; to identify the real and potential problems of the forest, namely, tree diseases and natural disasters, primarily forest fires. The capabilities of drones provide insurance companies with a convenient method of assessing damage to forestry in appropriate cases.

- In the oil and gas industry, unmanned aircrafts can be applied in such important aspects as environmental assessment in drilling areas; to monitor the status of oil and gas pipelines. Given the rather frequent problems with oil spills and natural gas emissions, the use of unmanned aircrafts is relevant for a quick response to these crisis situations.

- In industries related to mining. This is the control of the quality of the environment, especially water, in the areas where the mines are located, monitoring the release of gas during hydraulic fracturing of the reservoir, the current state of the mines, and also looking for new sources of minerals and precious metals.

- For infrastructure objects, unmanned aircrafts are useful in tracking the condition of railways, roads and power lines, assessing their damage, identifying leaks from pipelines.

- Conducting search and rescue operations, scientific research (both on land and on water) [2].

However, in Ukraine, the market for services using unmanned aircrafts for civil purposes has not yet been formed. One of the reasons for this situation is the lack or imperfection of the legislative and regulatory framework for the use of unmanned aircrafts.

The European Aviation Safety Agency is making great efforts to regulate the use of drones in the common European space. Moreover, an international group of experts is working on developing standards for unmanned aircrafts, including the safe integration of small and large unmanned aircrafts into airspace and airports. Although Ukraine is not a member of this organization, it, as part of international airspace, is obliged to provide a safe environment for civil aviation. Moreover, as a future member of the united European sky, Ukraine must enact new legislation in accordance with European standards.

According to Ivan Chaika, a start-up consultant in the US-Ukraine Foundation, in modern legislation there is a definition of the unmanned aircrafts, but their use is not individually regulated and is partially described as part of a wide group of civil and commercial aviation, in accordance with the regulatory airspace regulations. In general, there are no special regulatory documents on unmanned aircrafts flights, certification, operator certification, and integration into the air traffic management area.

At present, unmanned aircraft is subject to regulation of the following regulatory legal acts: the Air Code of Ukraine, the Rules for Registration of Civil Aircraft in Ukraine, the Regulations on the Use of the Airspace of Ukraine, the Rules of Aircraft Flights and Air Traffic Services in the Classified Airspace of Ukraine. An "unmanned aircraft" is defined there as an aircraft intended for a flight without a pilot on board, whose flight control and control is carried out by means of a special control station located outside the aircraft. Such unmanned aircraft should be in the Register of Civil Aircraft of Ukraine. However, unmanned aircrafts, the maximum take-off weight of which does not exceed 20 kilograms and used for entertainment and sports activities. do not require registration.

The State Aviation Service of Ukraine promulgated the draft Concept of the Regulations and Procedures for Ensuring the Safety of Aircraft of General Aviation, Sport, Amateur and Unmanned Aircraft.

This Concept largely overlaps with the relevant provisions of the European Parliament Resolution on the safe use of the so-called "remotely piloted aircraft systems", known as "UAVs", in the field of civil aviation, on the other hand, it seems that the Project is in compliance with the Convention on international civil

aviation, which obliges states to ensure safe conditions for civil aircraft in areas where drones are used.

Summing up, it can be said that the drones exhibited a wide range of issues for our society

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