Interreg - IPA CBC
Hungary - Serbia

ITC MInd
INOVATION & TECHNOLOGY
CENTER FOR METAL INDUSTRY

Innovative model to support innovation development in SMEs
KONELEK Batajnica - Serbia

The project is co-financed by the
European Union

Good neighbours
creating
common future

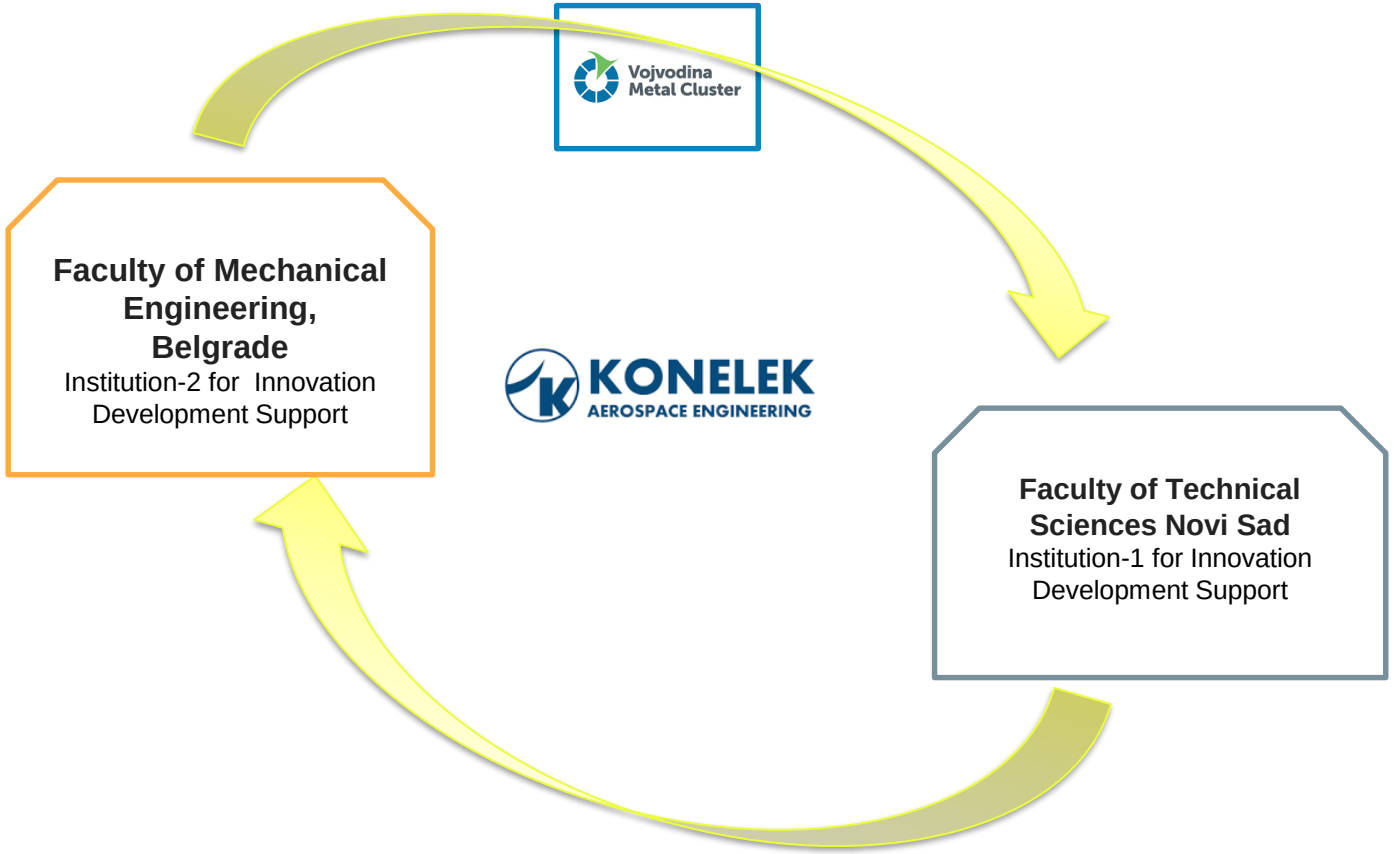
When the company / SMEs has an innovative idea and doesn't know what and how to proceed, then the Innovation pool helps.

The basic concept of the INNOVATION POOL ITCMInd idea

Step 1 - identify a company / SMEs that has innovative potential and an innovative idea
Step 2 - initiate innovative capacities of the cluster, hire experts for the realization of innovations
Step 3 - study the problem (for example: technologies, legislation, standards ...) - create an ALGORITHM for solving a concrete innovation
Step 4 - around an innovative company / SMEs cluster creates a team of experts / institutions necessary for the realization of a particular innovation – INNOVATION POOL
Step 5 - Innovation pool provides support to the company / SMEs in the development of innovation from idea to commercialization - develops a BUSINESS PLAN for commercialization
Step 6 - Public presentation of the BUSINESS PLAN, animation of potential investors and collection of funds for the realization of the innovation (jointly working : companies / SMEs, cluster and members of the Innovation Pool)

Project manager
Zoran Pekez

Innovation pool KONELEK Batajnica



DARE – DRONE FOR AGRICULTURE - RESEARCH ENHANCEMENT

Konelek D.o.o.

ITC Mind project

The metal sector is a part of value chains of all types of industries. The focus of this project on increasing innovation potential of the metal industry in the Hungary-Serbia border region, as a contribution to the overall competitiveness od small and medium enterprises (SMEs).

Description of the project in one sentence	To reinvent Tractor for the 21 century
Main objective	To meet targets of the market for the drone technology in the agriculture.
Total value of the project (EUR)	602.821,76
Amount of funds requested from the Innovation Fund (EUR)	300.000,00
Industry/Sector	Machines and Mechanical Engineering/Food and Agriculture

Our company

KONELEK
AEROSPACE ENGINEERING

Konelek D.o.o. is a high tech, family run company, located in Batajnica, involved in producing equipment for civil aviation, namely ground support equipment (tools to fix aircraft while on the ground). We deliver products to keep Airbus aircraft and Rolls Royce jet engines flying, we ship directly to their distribution centers. So far we made more than 25.000 ground support tools and this is our core successful business. For every Airbus flying today there is 2-3 of our tools, and we entered this market only recently in 2011. Our business is 100% export oriented and we sold 2M euros worth of high tech products in 2018.

Project summary

DARE project is aimed to make new improved product based on the existing prototype agricultural drone “Robin”. “Robin” is a remotely controlled aircraft which is capable of doing many tasks, but the main one is agricultural spraying. It does not have wings and it takes off and lands completely vertically and lifts 50kg of weight, easy to operate and can take off and land from small spaces.

The drone Robin solves some of the existing problems of agricultural spraying

- Spraying at elevated and sloped terrain (most of the vineyards are at slopes)
- Work in all weather conditions (hard with today’s technology)
- Eliminating the damage to the plants
- Reduction of the pesticides
- Automation of work

Market needs

It is attractive to have an unmanned drone to be used for agricultural spraying but it would be good to have following:

- Capability to deliver couple of hundreds of liters per hour of the liquid
- Capability to be used fully automated with minimal human interaction
- Capability to fly longer, possibly 60 minutes or longer
- To control multiple drones at the same time (Swarm)
- Hybrid power systems
- Variable rate application technology
- An agreeable price

Market needs

We have concluded that our product “Robin” is not competitive enough and that it needs further development to close the gap above.

The improved product is aimed at the following customers:

- Farmers, especially vine growers in Switzerland, France, Serbia
- Companies which grow seeds like DuPont Pioneer (signed memo), Syngenta, KWS
- Potato growers in Holland and service providers in Holland like ABDrone (signed memo)
- Orchard farmers like: Delta Agrar (memo signed) and Rasadnik Topalovic (verbal agreement) from Serbia
- Drone spraying companies like Rantizo, USA (signed memo)
- City of Belgrade wants to buy one drone for emergency relief, we had a meeting with emergency secretary

Developement

The modifications we are planning to introduce which would make the drone more competitive on the market are following:

1. Batteries
2. Hybrid power
   a. One gas piston engine
   b. One mini gas turbine
   c. Combination of electrical and gas engines
3. Hydrogen power
4. Superlift
5. Building advanced composite structures
6. Building of the graphene nano structures
7. Developing of the capability for designing
8. Development of the Variable Rate Application capability
9. Development of the RTK precision guidance systems
10. Development of the swarm control technology
11. Novel battery development

Challenge and solutions

Classical spraying

- Damaging plants.
- All crops are best sprayed 24-48 hours immediately after the rain
- Some of the crops (vineyards, raspberries....) are mostly grown under inclined terrain
- Risk to human health
- Spacing of the plants is not optimized.
- Classical application of the pesticides is to apply maximal amount of the liquid all over the plot
- In some cases application of the pesticides from the ground is not optimal

Drone spraying

- Optimum height just above the plants
- Damage to plants is also zero
- Effective spraying on inclined terrains
- Risk to the human exposure of dangerous liquids is minimal
- Variable rate application (VRA), where images from drones are used to determine how much of the pesticide each plan should receive
- Studies show: spraying from the drones is the most effective way to spray
- The spraying can be fully automated

Market

Switzerland

Swiss area „Valais“ has 5.000 ha, 600 vine producers with 40% of total Swiss production at 1100m of height and lot of vineyards have steep slopes of 70% gradient so that all work in these vineyards has to be done manually.

USA

USA: Only in California, there are about 50.000 ha with more than 1500 vine producers. It is possible to spray crops from drones in the USA with special licenses. There are 888 certificates in the USA for drones for agricultural surveying, potentially being interested for spraying.

Serbia

Serbia. There are 25.000 ha of vineyards in Serbia with about 80.000 families involved in the vine production. It is possible to spray crops from drones in Serbia with special license. Additionally there are 15.000 ha of raspberries plots in Serbia with about 200.000 people employed.

Potential clients

Our perfect customer: **DuPont Pioneer**, the leader in the seed production with the EBIT of 843M$ at rate of 17% and growth of 3,6% annually and selling in 130 countries. We already have signed memorandum of interest with DuPont Pioneer representatives, they seem very enthusiastic about the product.

Further growth markets:

- Service providers of tractor spraying: Companies which do service of the spraying of the crops.
- Drone surveyors: Companies which do surveying of crops have expressed an interest to grow and offer their customers spraying.
- Vine growers: vine growers today spray with human labor. For them the reduction in human effort is up to 5 times.
- Also: individual farmers and companies which grow high values products such as fruits, vegetables, flowers, orchards.

Revenue model

- Our main revenue model is simple, we make the drone for the cost of about 30.000US$ and sell them for about 50.000US$. With the price of 50.000$ we are making close to 40% gross profit without cost of promotion and marketing. With the cost of higher promotion and marketing our profit would be down to 25-30%.
- We have the capacity to make 10-12 aircraft per year and if this proves realistic we could have a profit of up to 240.000US$ annually. We are able to scale up and down the costs related to the market pull.
- Our current closest competitor Agrofly are selling their product at the cost of about 50.000 US$ which is the same price that we want to sell our product which is at the same time 5 times more superior in the terms of the capacity. The price of the Yamaha R-MAX is about 150.000US$ with again only the fraction of our capability. The price of DJI Agras is about 15.000-20.000US$ with again small fraction of our capability. This makes our product competitive even now, but is it going to be more so in the future when we analyze the product for cost saving ideas and employ them.
- Second revenue model is in the spare parts, repairs and refurbishment.
- Third revenue model is the service of renting the drones and the crews.

Thanks!

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