



**TOP-10 PROPOSALS UCA
IN ADVANCED MANUFACTURING
FOR INTERNATIONAL PARTNERS**



**UKRAINIAN
CLUSTER
ALLIANCE**

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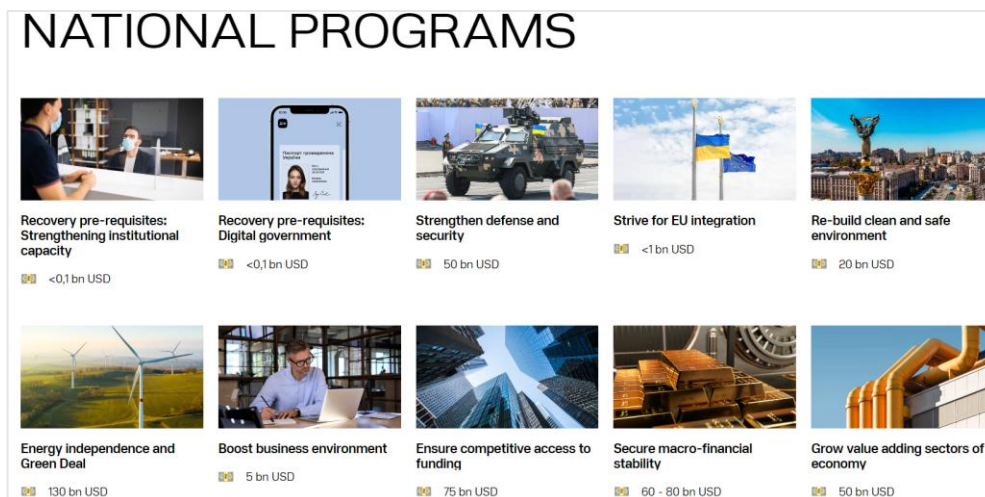
FOREWORD

The war between Russia and Ukraine turned over the notions of human values in all civilized countries. The statements of Western politicians about «good and friendly Russia», promoted by decades, took the full fiasco on 24th of February 2022. And today, Ukraine pays the highest price for holding the front for whole Europe, for the whole democratic world.

In Ukraine, we all believe in our victory. We do not know when it will come. But we know that united with all Western countries, facing both economic and military challenges, we will win faster, and saving more human lives and material assets.

However, as the Ukrainian Cluster Alliance (UCA), we understand that planning the future in the economy needs more clear perspectives. We aware that is impossible to win on military front without economic one.

Our government started the grand plan of [Recovery of Ukraine in June 2022](#). It creates big lines of recovery for destroyed regions, but it also considers main economic challenges in **Energy, Infrastructure, Building, Manufacturing and Logistic** in Ukraine. This first initiative has been supported by leading Western analytic groups, and in September 2022 the clear proposal of [Marshall plan has been appeared](#). The overall recovery programs varies from 100 to 300 bln US dollars and they will be done with US and EU partners.



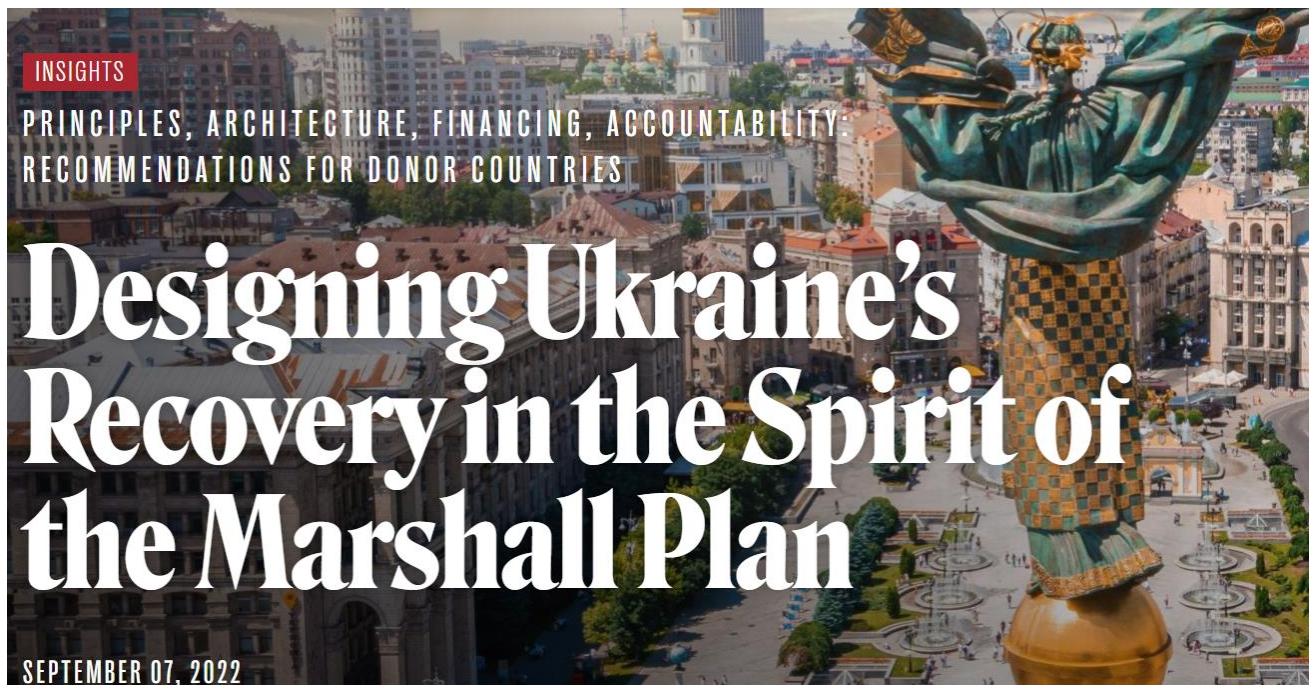
As the leading union of Ukrainian clusters, UCA comes into this arena of grand reconstruction with its own programs and projects. We believe in the power of clusters to build resilient and innovative values chains. Today we start to rebuild these chains inside of the countries but also to link them with our EU partners. We heavily promote the idea of **integrated value chains UA – EU** and we are first to support this strategy at the level of our clusters.

That is why we developed this proposal «top-10». It proposes 10 big initiatives declined into concrete projects, and which we can do with EU partners.

Followed to the experience with military and other kind support we strongly believe in the power of Eastern Europe and Balitic countries to support us the best way. So, we position these proposals firstly for them, but finally we invite all our partners to participate in Recovery of Ukraine. It is a time build relationship now. And now support Ukrainian companies and sectors, many of them are in really difficult situation. We starts with Advanced Manufacturing sectors and we will soon follow with other ones.

This offer will be promoted by UCA in all international events where we participate.

Head of UCA Alexandre Yurchak



UCA CLUSTERS IN ADVANCED MANUFACTURING

Ukrainian Cluster Alliance (UCA), <https://www.clusters.org.ua/en/> is the leading national association in Ukraine, uniting 37 clusters. 9 of them represent sectors of Industrial Engineering, Automation and IT, Metalworking and Machinery, that we refer to Advanced Manufacturing.

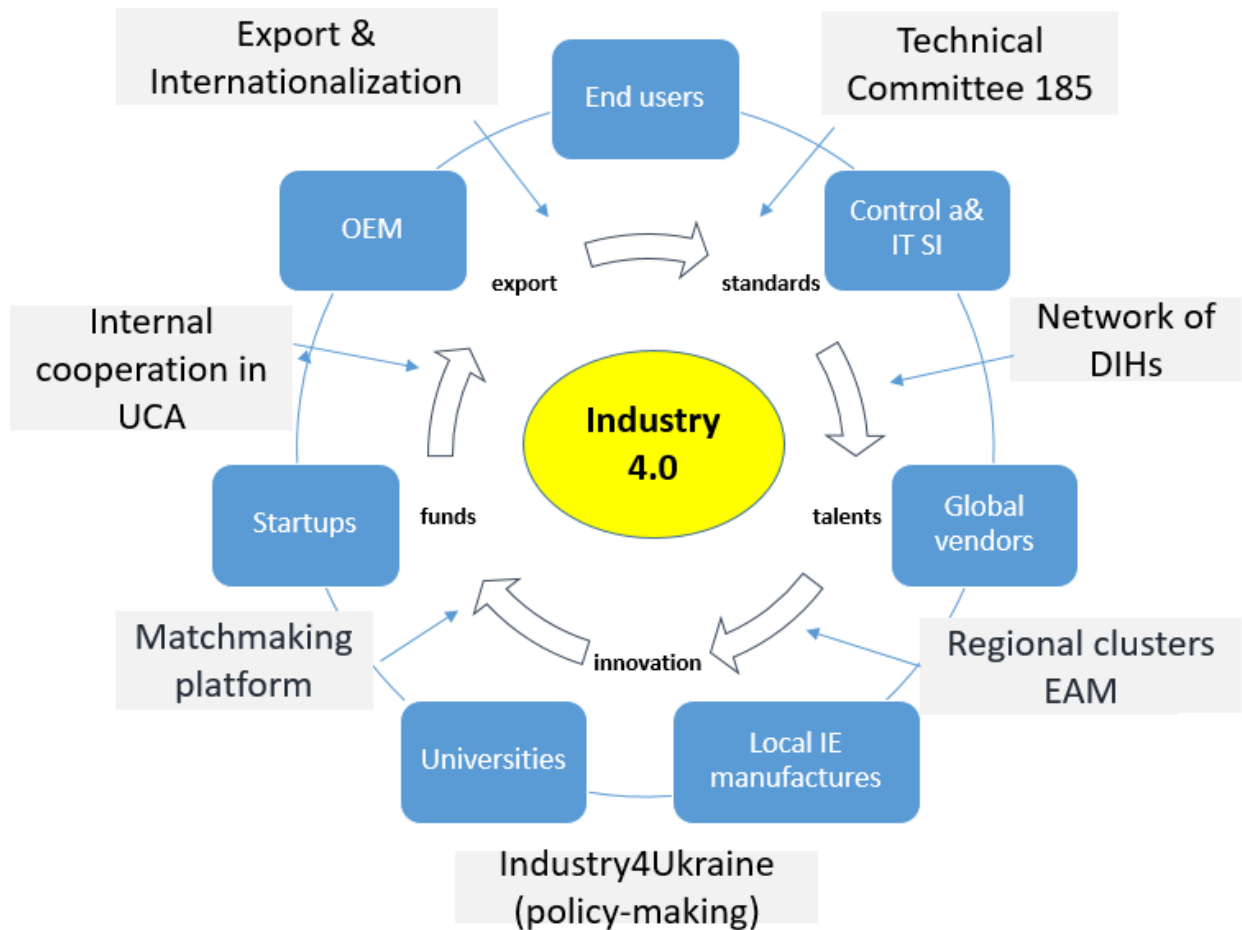
The table below resumes the main information about these clusters.

	Cluster Name	Specialisation	Region	Web-site	Contact person
1	Association of Industrial Automation of Ukraine (APPAU)	Industrial Automation and IT / Industry 4.0-5.0	National level	https://appau.org.ua/en	Alexandre Yurchak, yurchak.alexandre@appau.org.ua
2	Vinnytsia Automation and Instrument Making (AIM)	AIM cluster focuses on Industrial automation and instrumentation manufacturing	Vinnytsia	https://www.aimcluster.org/	Yurii Klymenko klymenko.y@gmail.com
3	Dnipro space cluster	A platform for innovations and creating high added value in rocket engineering, exploration and (ci	Dnipro	https://www.facebook.com/dniprospaccluster	Evgen Rokitsky
4	Zaporizhzhia EAM	AIM cluster focuses on Industrial automation and instrumentation manufacturing	Zaporizhzhia	https://www.iamcluster.zp.ua/en	Andrii Karpenko karpenko.a.v2@gmail.com
5	Kharkiv EAM	AIM cluster focuses on Industrial automation and instrumentation manufacturing	Kharkiv	https://www.iamcluster.kharkiv.ua/	Oksana Sytnyk oksana049@gmail.com
6	Sumy energy equipment	The Sumy machine-building cluster of power equipment	Sumy	https://www.en.e-cluster.org/	Vladislav Kondus vladislav.kondus@meta.ua
7	Maritime Cluster of Ukraine	Ukrainian Maritime Cluster connection point for entire maritime sector		https://www.en.e-cluster.org/	Yuri Zhukov y.zhukov@c-job.com.ua
8	Ukrainian Automotive and Mobility Cluster	Cluster created by the leading component manufacturers for the automotive industry.	Kyiv	https://automotivecluster.org.ua/	Olga Trofimova olgatok@gmail.com
9	Ukrainian union of aerospace clusters	Ukrainian union of aerospace clusters	Odesa	https://spacecenter.od.ua	Evgen Rokitsky tristar.ua@gmail.com

UCA closely collaborates with many actors of innovative ecosystems in Advanced Manufacturing, such as:

1. Policy making platform Industry4Ukraine.
2. Digital Innovation Hubs – Center 4.0 KPI and Kyiv Academic University.
3. Technical Committee 185 «Industrial Automation».
4. Incubator «Sikorsky challenge».

Association of Industrial Automation of Ukraine (APPAU) is the leading national association uniting 300+ participant in the national movement 'Industry 4.0 in Ukraine' and playing of orchestrator and assets builder in the local innovative ecosystem.



EASTERN EUROPEAN INITIATIVES

Initiative #1: to review existing EU4xxx programs and to create new programs for Ukraine together with Eastern European and Baltic countries

Ukrainian Cluster Alliance believes that the existing EU4xxx programs (Business, Digital, Environment, etc.) were not efficient enough in peacetime and did not give significant results for development of industrial SMEs in Ukraine due to:

1. Weak efficiency for industrial hi-tech and insufficient governance on the side of the State institutions.
2. Significantly higher level of Ukraine's maturity in innovation compared to the other members of Eastern European Partnership (Armenia, Moldova, Georgia, Azerbaijan and Belarus).

Now, when the political incompatibility (Belarus, Armenia...) has been added to this list, there are many **challenges due to the war**, which includes geo-political challenges, numerous gaps in value added chains, supply chain challenges, and logistics,

We believe in necessity of an urgent focus shift of Ukraine from EaP countries to Eastern Europe and Baltic countries.

How it can work: Eastern European partners, together with Ukrainian partners, enlist support of their governments and come up with appropriate proposals for creation of Eastern European programs with inclusion of Ukraine at the European Commission level.

As this initiative is very young and the overall topic might be sensible to the policies of EU commission, the projects are not yet developed. At the beginning we propose just open discussions.

Initiative #2: To establish regular experience exchanges of policy-makers in Advanced Manufacturing on bi-lateral / multilateral level

UCA came from the [Industry4Ukraine platform](#), created in 2019 for policy-making in Advanced manufacturing. Earlier, in 2016 APPAU started collaboration with the country's government to accelerate reforms in the key areas of industrial, innovation, digital and cluster policies. In 2018, we prepared a project of the Industry 4.0 strategy, and in the following years – up to a dozen more detailed proposals for changes in the specified policies and strategies. But all these policies move too slowly at the State level and we need much more support in this area.

Relevance to the war time challenges: In general, this initiative can be attributed to the post-war period. At the same time, taking into account rapid degradation of industrial high-tech sectors, we believe that it is now necessary to lay foundations for these changes. If the war drags on, many of them may cross the point of no return.

How it can work: Eastern European partners, together with UCA and Industry4Ukraine platform committees, form several working groups with inclusion of representatives of relevant ministries and parliamentary groups, which during 2023 will launch cycles of exchanges (online and offline) to transfer experience and knowledge to Ukrainian policy-makers.

Project #1: Benchmarking policy-making processes in Industrial policies, incl Advanced Manufacturing

Participants	UA side: Ukrainian Cluster Alliance, Chamber of commerce of Ukraine, committees of Parliament, Ministry of economy, Ministry of strategic industries of Ukraine EU side: FPPP (Poland), CzechInno (Czech Republic), CIMES (France), European Cluster Alliance, UNIDO
Objectives	The general goal is to move policy-making processes in Ukraine at the level of best EU practices and standards by, - <ol style="list-style-type: none"> 1) Setup benchmarks for Ukraine in Industrial policies 2) To align the approaches and practices in Ukraine with the best EU practices 3) Defining the roadmap for necessary changes in Ukraine in industrial policy-making and strategies
Activities	1) exchanges and visits with 3 target countries of EU (Czech Republic, Poland and France), 2) Studies of policy-making processes / benchmark analysis, 3) Preparing the roadmap of changes in Ukraine 5) Final reporting and dissemination / communication campaign
Outcomes	<ol style="list-style-type: none"> 1) Much better alignment and collaboration between Business support organizations and Public bodies in Ukraine with regard to Industrial policies 2) Improved effectiveness in policy-making (number and quality of new law proposals) 3) Improved process of the Industrial dialogue between EU and Ukraine 4) New collaboration initiatives between countries participant supported by their governments
Period and Budgets	1 year / 300 k euro

Cases to be considered: benchmarking studies has been done twice on the Industry4Ukraine platform. In 2018, in the frame of [Industry 4.0 strategy](#), APPAU presented the detailed benchmarking analysis, indicating the lagging of Ukrainian policy makers in this area. In 2020, based on UNIDO's works, Industry4Ukraine experts elaborated and promoted the guide '[Instrument of Industrial policy](#)'. Being well perceived and consolidated at the level of expert communities, these works had a small impact on Public bodies. In last 2 years policy-makers reached just 2 important changes at the level of legislations.



These are new laws about industrial parks and localization in manufacturing in public purchasing. Expert of Industry4Ukraine say, that these instrument are just 2 of 10+ necessary to adopt at the national level. The biggest deficit of such instruments is at the level of digital and innovation policies in Manufacturing where Ukraine is lagging behind all EU countries. Meanwhile all economic indicators show the growing de-industrialization of Ukraine and the war just accelerated these processes. This case proves that we need much more engagement of Public bodies into the policy-making processes.

For other options of Internationalization of Ukrainian clusters, see the Strategy of UCA



PRODUCTION COOPERATION / INTEGRATION OF VC / CLOSING GAPS IN SUPPLY CHAINS

Initiative #3: To develop programs of integration into European Value Chains

Necessity:

The war clearly showed the dependence of Ukrainian supply chains and export on transport ways through Eastern European countries. Today there are many initiatives and ideas – from «dry ports» to logistics corridors (Solidarity lanes etc). UCA proposes to expand them also to programs of **greater integration in EU value chains**, which have already proven well, for example, in the automotive and textiles industries. Why can't these examples be extended to other industries, including the defense industry?

Relevance to the war time challenges:

Similar programs, designed to significantly improve industrial cooperation between neighboring countries and supported by governments of Poland, Czech Republic, Slovakia, and Romania, would lead to a significant improvement in trade with Ukraine, creation of new jobs in all partner countries, and most importantly, they would allow to keep alive Ukrainian SMEs in many industry sectors, which are currently in a critical state.

How it can work:

Obviously, it is worth distinguishing several sub-programs here, and not to confuse, for example, logistics corridors with issues of production cooperation in the defense industry. The main mechanism for integration into VC: partners create working groups that consider a complex of problematic issues to accelerate integration of Ukrainian enterprises into East European VC. Clusters and industry associations on both sides are key actors in developing these proposals.

Project #1: Collaboration of dual use clusters of Europe with the focus on UA needs

<p>Participants</p>	<p>UA side: APPAU, 5 EAM regional clusters, Association of defense technologies, Aerospaces clusters (80 selected SMEs, developers and integrators) EU side: key clusters and business associations from Europe having direct relation to dual use technologies</p>
<p>Objectives</p>	<ol style="list-style-type: none"> 1) To unite and to coordinate EU-UA alliances in dual use technologies 2) To ensure faster 'go-to-market' processes with regard to urgent needs of Ukrainian and Eastern Europe defense sectors 3) To enforce and grow UA industrial defense and dual use technologies sectors

Activities	1) series of C2C/B2B events / defining, profiling and prioritizing challenges, opportunities, 2) forming cluster initiatives and funding projects, 3) launch of 5-7 projects between UA - EU clusters (incl possible production facilities in Czech Republic and Poland)
Outcomes	1) The launch of Eastern Europe cluster collaboration in dual use technologies 2) Improving resilience of value chain and capacities of defense sectors of Ukraine and other EE countries
Period and Budgets	TBD (exchanges to be launched ASAP)

Cases to be scaled up: there is not (yet) dual use cluster in UCA. Contrary, UCA **practices to group the limited cluster resources into 1 bigger pool with a centralized coordination**. Such Center (called Emergency Support Centers) launched in Utilities sectors, Food and Industrial Engineering. Similar initiative is under development in dual use technologies. Here, UCA collaborate with Association 'Ukrainian Defense and Security Technologies' and unities SMEs & developers by industry or specialization in defense / dual use technologies. Such initiative are quite necessary today in Ukraine where there is a huge deficit of dual use technologies. On the one hand, the local defense industry is significantly depressed, and on another hand, there are hundreds of volunteer groups but which struggle of lack of coordination.

As example, see the solutions from Infocom Ltd, one of the leader of Industrial Automation market, but which heavily invests into dual use robotic platform since 2015. Infocom looks for EU partners in this area.

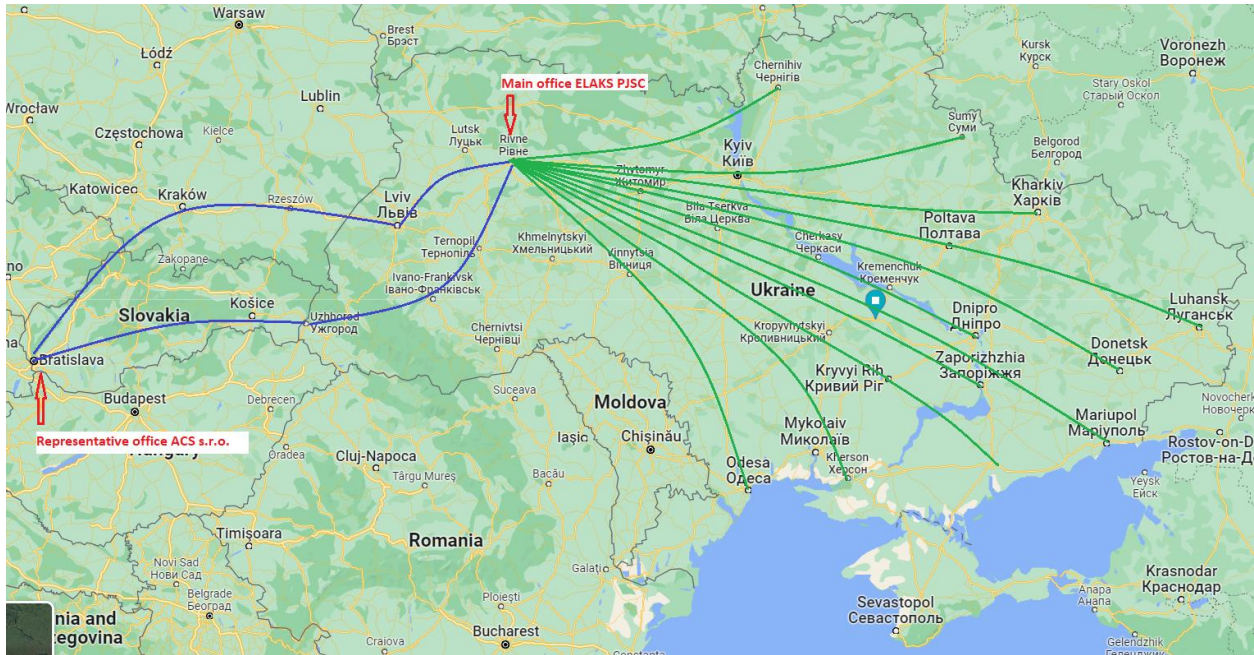


Project #2 Logistic HUB in electrical engineering to help Ukraine rehabilitation of critical infrastructure

Participants	UA side: EAM clusters head by Kharkiv regional cluster EAM (SMEs developers and integrators of control systems and power distribution devices) EU side: key clusters, business association, SMEs distributors of electrical products, system integrators and developers of control systems and power distribution systems from Europe
Objectives	1) Assistance in the restoration of the critical infrastructure of Ukrainian cities, which was destroyed as a result of shelling by the Russian Federation (electrical substations, electricity distribution points, thermal power plants, pumping stations, etc.) 2) Assistance in the restoration and strengthening of power supply systems for social facilities (hospitals, orphanages, nursing homes, etc.) 3) Assistance to the military on the front line (electric generators, autonomous lighting and heating systems, etc.)
Activities	1) Organization of a warehouse on the territory of the EU (Slovakia, Bratislava, Automatic Complex Systems s. r. o.) 2) Reception, storage and consolidation of humanitarian aid. 3) Identification of an object for assistance in cooperation with APPAU and regional clusters EAM. 4) Delivery of humanitarian cargo to Ukraine to the object to which assistance is provided.
Outcomes	1) Participation in projects for the restoration of Ukraine. 2) Assistance to the Ukrainian military. 2) Assistance to critical infrastructure and country's activity.
Period and Budgets	1, 5 years/ 10,5 mln. euro

Cases to be scaled up: *there was huge gap in supply chain in March - April in Ukraine when most of foreign suppliers stopped deliveries into Ukraine. Considering different options, Kharkiv EAM cluster proposed services of ELAKS (cluster members) whose facilities have been already relocated in Bratislava, Slovakia. ELAKS got its own and good experience delivering in Ukraine electrical goods and services, with much better time of delivery compared to traditional schemes. Project ideal comes from this experience, what if we create the common logistic center for many accumulated needs in Ukraine including humanitarian ones?*

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Kharkiv EAM cluster: Vitaliy Zaitsev, vitaliy.zaitsev@gmail.com



*Bratislava can serve as a hub between EU countries and Ukraine.
The main office of ELAKS is relocated from Kharkiv to Rivne.*



*ELAKS is a biggest panel builder in electrical engineering in Ukraine.
They have relocated a part of facilities in Bratislava on March 2022.*

Project #3: technical standardization: improving the quality of technical standards in Ukraine in Oil & Gaz / Energy sectors, by setup of the modern metrological center

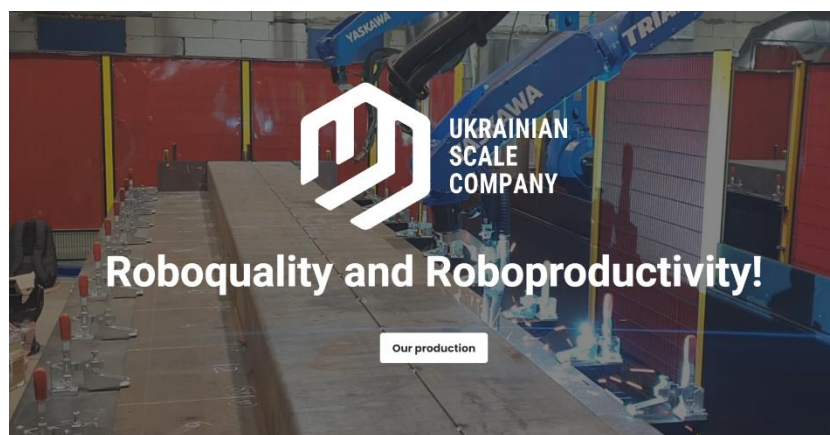
Participants	Ukrainian side: 1) Kharkiv EAM cluster, 2) State body 'NaftoGaz of Ukraine' / Ukrtransgaz EU side: TBD
Objectives	1) Creation of a modern metrological center for verification of both gas meters and accounting tools for alternative energy sources 2) Facilitating the provision of quality infrastructure within defined value chains in accordance with European standards. 3) Provision of new solutions to improve the quality infrastructure of Ukraine in the direction of green economy and digitalization
Activities	1) Exchange of the best European practices, 2) Preparation for joint projects in the format of round tables, 3) Analysis of the possibilities of project implementation in view of integration into European LDVs and quality infrastructure improvement programs 4) Development of a technical and economic justification of the project 5) Presentation of the project feasibility study to stakeholders 6) Finding and attracting financing for the implementation of the project in Ukraine, 7) Development of design and estimate documentation, 8) Construction of the center, 9) Joint participation in EU programs
Outcomes	1) Support and improvement of the quality infrastructure of Ukraine 2) A metrological center for accounting of gas and alternative energy sources has been created 3) The procedure for using the center has been determined together with european partners. 4) A development plan for the center and additional examinations for Ukrainian and European consumers has been developed
Period and Budgets	2 years / 3,5 million euro



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oksana049@gmail.com

Project #4 Creation of an engineering competence center for metalworking

Participants	Ukrainian side: Kharkiv, Zaporizhzhia clusters EAM/ Engineering services EU side: key clusters and/or associations specializing in engineering and ICT from the Czech Republic, Slovakia, Poland, Lithuania (Recovery curators in a certain sector / region in Ukraine)
Objectives	1) Creation of centers of expertise / engineering consulting 2) Improving cooperation between local and foreign contractors and cluster organizations 3) Exchange of best practices, study of mutual experience, integration into European value chains
Activities	1) research of modern technologies in the field of metalworking / definition of the main needs of the Ukrainian manufacturer 2) exchange of best practices 3) organizational changes / personnel training, 4) market development for suppliers and contractors
Outcomes	1) Improving the awareness of Ukrainian manufacturers about metalworking technologies 2) European partners were informed about the possibilities of cooperation in Ukraine 3) Creation of new cooperation projects, exchange of technologies and skills 4) Developed training and internship programs, exchange of personnel training experience
Period and Budgets	2 years / 10,2 million euro



Cases to be scaled up: Kharkiv, Zaporizhzhia, Mykolaiv, Dnipro are recognized cities of Ukraine with strong traditions and expertise in metalworking. Strong deindustrialization processes of the last decade degrade positions of big (post-soviet) enterprises when new SMEs are still growing. United into Industrial Engineering clusters, such SMEs need support of new quality standards, skills and technologies. The war just actualized and deepen these issues as all mentioned cities. in many

cases, lost their best assets, staff and customers. New competence center, specialized in metalworking, can provide shared assets and services for hundred of SMEs, and so far foster and save their businesses.

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Initiative #4: To better integrate Ukrainian engineering potential, which includes outsourcing engineering services

Most engineering companies, SMEs from industrial high-tech sectors today have lost their markets in Ukraine by 50-90%. In the absence of government orders and exports, these enterprises will be forced to go bankrupt or completely change the field of activity. This means extremely negative consequences for a number of critical industries, first of all, the defense industry, whose personnel and production infrastructure are based on these sectors.

Relevance to the war time challenges:

The survival of these sectors will mean keeping alive the domestic defense industry and other medium-high-tech sectors.

How it can work:

The program can be implemented through common participation in the Recovery program of Ukraine, and as a sub-program of a larger strategy of better integration in value chains in Advanced Manufacturing in Eastern Europe.

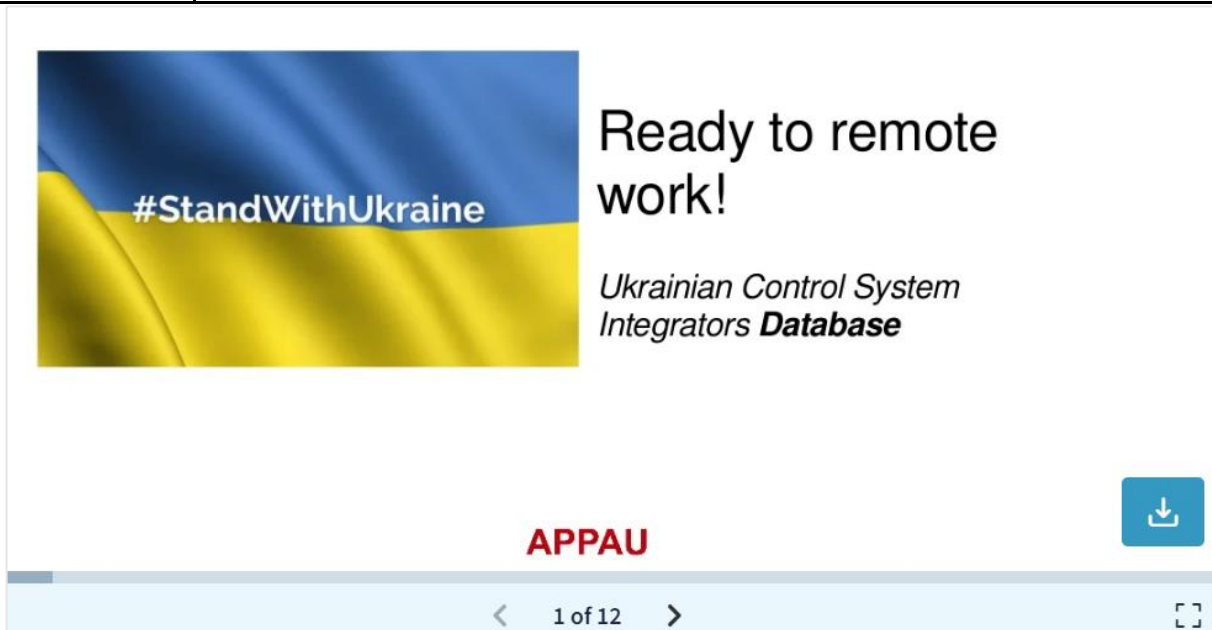
The pathway go through main 3 stages:

1. Support of UA industrial developers & SMEs in surviving during the war times by outsourcing their staff in own projects in EU and worldwide.
2. Inviting the EU partners into projects of Recovery of Ukraine.
3. Building together strong partnership in providing new innovation solutions across Europe.

Project #1: Development of interconnection and partnership between developers and system integrators from Ukraine and Eastern Europe / Baltic countries in Advanced Manufacturing

Participants	UA side: APPAU and 5 EAM regional clusters (50 selected SMEs, developers and Control / IT System integrators) EU side: key clusters and business association from Eastern Europe (50 selected SMEs, contractors, CSI and software houses)
Objectives	1) Support to UA SMEs in wartimes: outsourcing & subcontracting of 30 companies from UA 2) Matching to key opportunities in Recovery program of Ukraine with the next common entering into 30 big projects in Ukraine 3) Providing new innovative solutions across Europe

Activities	1) a targeted campaign of matching key SMEs from both sides , 2) Activities for approaching and outsourcing UA SMEs , 2) Analysis of opportunities in Recovery programs and targeting common ones, 3) Preparing to the common projects / Regular exchanges and setup of best practices, 5) Common participation in the EU programs
Outcomes	<ol style="list-style-type: none"> 1) Maintaining and improving the level of local CSI/IT & developers in Ukraine, services to local end users 2) Common participation in at least 30 Recovery projects 3) Established common level of high standards in Automation / IT Industrial Systems in majority of Recovery projects with respect to best quality standards (CSIA, ISO, IEC relevant to Industry 4.0) 4) Increased engagement and participation of developers and SMEs and startups in Digital / Horizon Europe (from both sides)
Period and Budgets	2 years / 1,2 million euro



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Ukrainian Control System Integrators **Database**

APPAU

< 1 of 12 >

Cases to be scaled up: Luigi de Bernardini, CEO of Autoware (Italia) and Alex Chausovsky (Miller Group, US) are key ambassadors, highly contributed to the [integrations of APPAU members into CSIA](#), the leading US association of Control System Integrators. They generated a set of initiatives which have already supported APPAU and increased our capacity to go global. For instance, the project [Land4Developpers](#) is under complete re-building due to funding organized by Luigi de Bernardini with CSIA.



*Photo from CSIA conference in Denver, US, June 22.
Luigi de Bernardini promotes the initiative «Professionals4Ukraine».*

What if such an initiative could be replicated in EU countries? Can we build trust together and overcome risks that many potential contractors still have considering outsourcing in UA industrial CSI & developers? Can we 'package' such stuff into more inspiring and more concrete perspectives of common participation in big projects across Ukraine & EU in the after war period?

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Initiative #5: To support Ukrainian critical industries by providing international technical assistance in smooth operation of enterprises and closing gaps in internal supply chains

These industries include production of medicines and medical equipment, food and processing, light industry, energy, critical infrastructure, construction, defense industry (including mechanical engineering). Critical industries are the basis of economic and military fronts. The first months of the war showed vulnerability of certain infrastructure segments, energy and medicine – such as the need for faster recovery after emergency shutdowns, disruptions in supply chains and shortages of personnel.

Relevance to the war time challenges:

Critical sectors provide the population and the Armed Forces with basic necessities (food, clothing, medicine), living conditions (housing, energy, water). Defense industry is (should be) the basis for maintenance and self-support of the domestic armed forces in conditions of complete dependence on Western supplies of weapons and equipment.

How it can work:

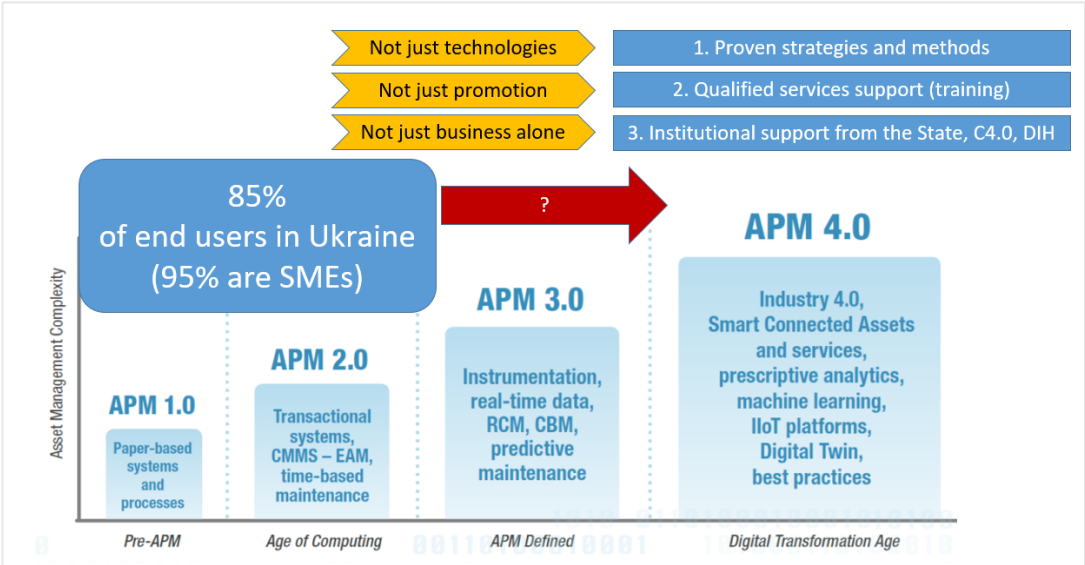
Clusters and business associations of a partner country take over a specific branch segment of a critical industry, together with a relevant cluster or Ukrainian association, consider a set of the most relevant priorities, and propose solutions. These solutions include both mobilization of own resources and involvement of assistance at the level of one's country or the EU.

Project #1: Creation of Emergency Support Centers in Utilities sector

Participants	<p>UA side: Kyiv, Sumy, Kharkiv, Chernihiv, Zhytomyr, Zakarpattia regions / Utilities</p> <p>EU side: key clusters and / or associations specialized in Utilities and ITC sectors from Czech Republic, Slovakia, Poland, Lithuania (curators of reconstruction in a given sector)</p>
Objectives	<ol style="list-style-type: none"> 1) Improve the availability of Utilities services for population by modernizing and digitalizing existing structures 2) Creation and management of the project portfolio for the future modernization / reconstruction Utility sectors 3) Improving collaboration between local and foreign contractors & cluster organizations

Activities	1) survey of Utilities sectors / defining main needs, 2) exchanges of best practices / set-up of ESC model according to benchmark, 3) organizational changes / staff training, 4) development a marketplace for suppliers and contractors, 5) developing pre-project proposals and project portfolio.
Outcomes	1) Improved capabilities of communities to attract investors and the state of Ukraine to support stakeholders by expanding capacities of Utilities services structures to response to critical situations -> improved availability of Utility services (heat, water, electricity) for population 2) Creation of new services and jobs for local communities incl local clusters 3) Smart cities and regions: approaching to best EU standards and practices, more sustainable and energy-saving management
Period and Budgets	2 years / 1,5 million euro

Cases to be scaled up: such a project (63k GBP, 6 months) has been already considered by APPAU and SUMY region cluster of Energy equipment. It was adopted to the terms of a call on June-22, led by the UK embassy in Ukraine (not passed). It can be improved and extended to more complex RFP incl international collaboration. But it is worth considering and it is useful as it proposes new ideas and initiatives of ESC based on collaborative approach and digital technologies. See in details [here](#). This case appeals to the large market problem linked to low maturity levels of End Users in Utilities. In particular, all they have obsolete processes and lack of modern skills. APPAU, inspired by Belgium BEMAS, regularly raises such issues on its Asset Performance Management conference.



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INNOVATIVE DEVELOPMENT. DIGITAL AND GREEN TRANSITION.

Projects announced in the [«Recovery» program](#) have already been declared by the government as innovative, green and digital. Meanwhile, Ukraine lacks a clear roadmap of a more thorough preparation of industries and innovation ecosystems for challenges of dual digital and green transition, as the EU does. After all, reforms in these areas and real sectors of economy were practically not carried out in previous years. Accordingly, the initiatives below are a guarantee that large-scale investment in the Recovery program will be successful.

Initiative #6: To accelerate integration of Ukrainian 4.0 Centers and DIHs into the European DIH network

Necessity and relevance to the challenges of the post-war period:

Innovative ecosystem of industrial hi-tech sectors need a special EU program that supports the development of Digital Innovation Hub (DIH) network in Ukraine. In previous years APPAU tried to develop the network of Centers 4.0, which concept is very close to DIH. But without State support and funding these tentative were not successful. Today we are completely switched to DIH model. The special program would accelerate this process and it is needed because the backlog of Ukrainian universities in this area compared to the EU (UA has just 2 active DIHs).

How it can work:

Partners develop a joint program to create and develop a network of 5 to 10 DIHs in Ukraine and will receive appropriate support from the European Commission. Czech, Polish, Lithuanian and Romanian eDIHs are becoming the main providers of knowledge and practices for Ukrainian DIHs.

Target projects

Project #1: The development of 5 UA DIHs with integration them in EU space (BOWI+)

Participants	UA side: APPAU and 5 UA DIHs from Kyiv, Kharkiv, Zaporizhzhia, Mykolaiv and L'viv. Key partners – 5 EAM clusters from the same cities. EU side: 5 eDIHs from Czech Republic, Poland, Lithuania (+2 from Western Europe)
Objectives	<ol style="list-style-type: none"> 1) Setup 5 DIHs for Ukraine as services organizations 2) Launch regular DIHs activities according to 4 major roles 3) Attract investment into regional innovation ecosystems at least 2 mln euro in 2 years

Activities	1) Exchanges / setup of blueprint (DIH model adapted to UA in 2 forms, - based on a Technical University and as an independent NGO (UA DIHs go through a selection process), 2) Training of DIHs staff for UA DIHs, 2) Mentoring of activities in each of 4 roles, 3) Launch of modern labs for prototyping, 4) Regular exchanges of best practices, 5) Common participation in EU programs
Outcomes	1) 5 times increased engagement and participation of UA innovative SMEs and startups in I4MS and similar program (Digital / Horizon Europe) (100 SMEs participating in calls) 2) The integration of Ukrainian SMEs and start-ups industrial SMEs into the European value chains and Innovation Ecosystems, providing opportunities to interconnect with key innovation stakeholders and networks across Member States and Horizon Europe Associated Countries. 3) Growth in number of European SMEs, startups and BSOs proposing innovations in UA for Recovery & other after war programs (200 SMEs)
Period and Budgets	2 years / 3 million euro



Cases to be scaled up: BOWI project (Horizon 2020), launched in 2021 is the 1st case about widening of mature Digital Innovation Hubs to less matured ones, incl. Ukrainian DIH «Center 4.0 KPI». The project became the strong push to develop the DIH network in Ukraine and it is coherent with APPAU initiative of [the deployment I4MS programs in Ukraine](#). However, the switching DIH KPI into implementing all 4 roles in servicing local SMEs is extremely difficult. Because of lack of good governance, it is difficult for experts to be at the same time in several roles (e.g. professors in

University, and innovation / technology brokers in DIH). Actual BOWI activities do not count this situation and we do not know how to cope with it, taking into account the almost impossible scenario of organizing DIHs beside Universities.

Initiative # 7: To create Eastern European network of Industry 4.0-5.0 experts

Necessity and relevance to the challenges of the post-war period:

A network of independent, qualified Industry 4.0 experts, able to diagnose enterprises according to the level of readiness and issue recommendations for development, is a key asset of most countries that are successfully implementing Industry 4.0 and 5.0 today. These experts are able to audit enterprises regarding the level of digital readiness and recommend the first steps towards digital transformation.

This practice was implemented by Western European countries, many Asian countries, today Poland is doing it. In Ukraine, such a network is completely absent. Big holdings move in an ad-hoc manner, while SMEs simply ignore the challenges, confusing digital transformation with usual automation of production and business processes. APPAU proposes creation of such a network in Ukraine, as well as in other countries of Eastern Europe, where it is absent, based on the [Singaporean government SIRI methodology](#), which is recognized as key by the EU today.

How it can work:

We propose to create a joint committee with partners to consider best practices in this area in Eastern Europe and to create a single Eastern European project for preparation of such a network, including Ukrainian experts.

Project #1: the launch of network I4.0-5.0 in Eastern Europe

Participants	UA side: main participants of Industry 4.0 ecosystems: APPAU, several EAM clusters, 5 UA DIHs, Incubator ‘Sikorsky challenge’. EU side: leading business associations and clusters in Industry 4.0 from Czech Republic, Poland and Lithuania
Objectives	1) to certify at least 10 experts per a country 2) to form the collaborative experts networks in 4 countries 3) to align and adopt to respective maturity level SIRI methodology 4) 4) to setup the initial roadmap ‘how to start with digital transformation’ for SMEs of low maturity sectors

Activities	1) expert selection and training, 2) expert exchanges and networking, 3) market surveys, 4) collaboration and exchanges in first pilot projects (audit of industrial SMEs), 5) adopting methodology to local context, 6) developing guide 'Getting started' (beginners of digital transformation from early- late majority segments)
Outcomes	1) acceleration of digital transformation in traditional Industrial sectors in Eastern Europe 2) improving resilience & innovation level, digitalization and greening of integrated and local value chains 4) Rise of demands for innovation on local markets / better integration of local innovators into domestic value chains
Period and Budgets	2 years / 2,5 million euro

Cases to be scaled up: expert network is a proven development instrument in many sectors worldwide. In Ukraine, the energy efficiency expert network has been prepared by several international donors and it's a recognized instrument of impact and development in different industries. It was also realized that such a network (number of certified experts) is still in high deficit in the mentioned area. One of the reason is the lack of alignment with State / Public policy. Regarding Industry 4.0-5.0, the idea of forming such a network was proposed by APPAU in 2016 in the program «Digital Agenda of Ukraine». Unfortunately it was not supported by the Government or donors, and today we stay still alone, and without progress when neighbor countries seem to have good movement ahead. The common project can speed-up the development such an instrument across all Eastern & Central Europe countries.



Initiative #8: Create industry roadmaps of digital transformation

Necessity and relevance to the challenges of the post-war period:

Development of clear priorities for promotion of digital transformation to key economic sectors (energy, infrastructure, food, metallurgy, defense industry, construction, machinery - engineering). Individual attempts to build such roadmaps in Ukraine are known only at the level of large holdings (DTEK, MHP...), but are practically absent among SMEs.

In 2019-2020, we, the APPAU, proposed our own format of preparing such roadmaps, which is focused specifically on SMEs and is based on 3 components (in stages):

1. Development of an industry business cases.
2. Their consideration and proposal of solutions by conducting trainings, hackathons and technological innovation days (TID).
3. Creating catalogs of innovative solutions at industry level and launching series of trainings for SMEs.

How it can work:

Eastern European countries already have considerable experience in digital transformation of individual enterprises and industries, including at the level of SMEs. APPAU proposes to introduce regular exchanges at bi- and multilateral level with definition of best practices in this area, followed by their wide distribution among countries participating in this project.

Target projects

Project #1: Creation of roadmap of digital transformation for FOOD industry

Participants	UA side: APPAU, 5 clusters and 2 DIHs. EU side: 5 clusters and 3 DIHs
Objectives	1) Creation of DT roadmaps for 5 key segments (milk, beverage, natural oil, elevators and floury, poultry) 2) Building maps of innovators / solutions and use-cases 3) Set-up of collaboration between UA and EU clusters
Activities	1) Engaging campaign for 5 target sectors, 2) Building map of strong business cases (10 per sector), 3) Exchanges with international clusters / best practices and benchmarks, 4) Engaging UA SMEs into EU relevant program, 5) Serie of sectoral Technology and Innovation days, 6) Training for decision makers from end users, 7) strategic session of building roadmap

Outcomes	<ol style="list-style-type: none"> 1) Acceleration of food sectors in digitalization and sustainable development 2) Improving collaboration and better integration in value chains and ecosystems with EU 3) New innovation projects between EU and UA clusters and DIHs in Food
Period and Budgets	2 years / 0,95 million euro

Cases to be scaled up: such a project was founded by APPAU in 2019, It was oriented mainly to local players, see <https://agri-food.appau.org.ua/en/home-page/> The project has not be launch because of lack of financing, just ome activities (as survey and seminars) have been done with limited scope. New proposal is oriented to much larger and international scale.



Initiative #9: To create sectoral incubators and accelerators network in Industry 4.0-5.0

Necessity and relevance to the challenges of the post-war period:

There are no modern incubators and accelerators of Industry 4.0-5.0 with a focus on production sectors and deep-tech startups in Ukraine. Their necessity is obvious in the post-war period, if we really want to make the most of domestic innovative potential, and not rely exclusively on imported solutions.

How it can work:

In Ukraine, we have practically no experience in creating such accelerators with a focus on the traditional industries. Accordingly, any initiatives and assistance from Eastern European partners are welcome. Possibilities of common accelerators for the entire zone are also being considered.

Initiative #10: Set up joint initiatives in the field of Circular Economy

Necessity and relevance to the challenges of the post-war period:

Implementation of the EU-Ukraine Association Agreement in terms of implementation of the Green Deal in general and The EU's Circular Economy Action Plan (CEAP) in particular. Separately, it is worth noting the need for Ukrainian companies to meet requirements of the new Ukrainian framework law 2207-1-д "On waste management".

How it can work:

Cooperation of APPAU participants with European companies in optimization of all the product life cycle stages. In particular, in terms of reducing use of primary resources, reducing greenhouse gas emissions, designing products in such a way that they can be reused, remanufactured, recycled or recovered and maintained in economy for as long as possible alongside resources with which they were created, and avoid or minimize generation of waste, especially hazardous waste. Also promote sustainable consumption and production.

Possible interest of Eastern European countries in implementation of these initiatives can lie in various areas – from financing their own institutions within the framework of EU funds, attracting business to implementation of projects in Ukraine and creating new mechanisms (which are sorely lacking) to professional assistance to Ukrainian industries and communities in these difficult times. Additions, comments or other proposals – please contact yurchak.alexandre@clusters.org.ua

USEFUL LINKS AND REFERENCES

1. [Marshall plan for Ukraine](#), proposal of GMF, 2022.
2. [The Strategic proposal of UCA for Ukrainian government in Export – Internationalization](#), 2022.
3. [Recovery program of Ukraine.](#)
4. [EU clusters support Ukraine.](#)
5. Web-site of [Ukrainian Cluster Alliance](#)
6. Industrial Automation and IT in Ukraine:
 - a. Web-site [Land4developers.](#)
 - b. Web-site [APPAU.](#)
7. [Outsourcing database](#) (by demand).