



**Рисунок 1 – Порівняння енергоефективності оснащення насосів з базовими і змінними роторами пристроями для зміни обертової частоти**

#### Літературні джерела

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## **PRE-CONDITIONS FOR SUSTAINED COOPERATIONS IN THE FIELDS OF RESEARCH AND INNOVATION**

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The modern technological system leads to the need to reform the traditional system of education and scientific activity. The reform process takes place around the world. The European Union is not an exception, the reforms in which began in the early 2000's. In Europe, reforms were



accompanied by the modernization of the technical education base. The difficult economic conditions in Ukraine have affected the situation of educational institutions. Traditionally, the organization of the educational process and the financing of education provided interaction with enterprises to acquire practical skills by participants of the educational process.

Crisis phenomena in the economy have led to a reduction of the level of cooperation between universities and industry. This problem enhances and maintains the actual technological lag. The cycle of return of investments in re-equipment of educational institutions is long and does not guarantee the result for a particular enterprise; therefore, entrepreneurs tend to buy ready-made solutions of more advanced economies. The low level of income does not allow us to use a modern element base. The lack of skills with the modern element base reduces the likelihood of the emergence of innovative ideas that will be close to the world's mainstream.

Each student, researcher and innovators must independently develop solutions to the same problems with access to modern, personalized production equipment. Together with regulatory restrictions, this increases the entry threshold on the R&D market or makes it unavailable due to limited resources and virtually no investment potential.

Despite the existing cross-border contacts of some researchers, the possibility of cooperation in innovation development is unknown to a wider audience of potential innovators. Instruments for cross-border cooperation and mobilization of new participants in the innovative movement towards cooperation are poorly developed. The absence of such tools leads to the fact that the population of the Ivano-Frankivsk region, Ukraine, and Maramures County, Romania, (hereinafter referred to as JOP) is mainly focused on cooperation with other neighboring countries. Neighboring countries (Poland, Slovakia) offer tools aimed at facilitating the work of innovators, attracting innovation in their economy. This causes the negative tendencies of active and creative migration from the JOP, which may deprive the future of the innovation potential.

The potential of the synergy of cross-border cooperation between Romania and Ukraine remains unfulfilled due to the low level of awareness of the cooperation opportunities of R & D communities on both sides of the border.

79 % of Ukrainian youth studies in universities. However, the innovation potential is not realized. The technological backwardness of Ukraine reduces the interest of Romanian innovators in cooperation with their Ukrainian counterparts. The problem is further complicated by the traditional approaches to the organization of the universities. The approaches to the organization of work of educational institutions in Romania and Ukraine are oriented towards traditional approaches; the resistance of institutional traditions does not allow the introduction of



project education. Participants in the educational process do not have the ability and skills to implement the projects. This leads to a high level of unemployment among high school graduates (near 30-40% in Ukraine), reduces the motivation of senior students to obtain higher education in the technical specialty.

The difference in the availability of technologies does not give the opportunity of the mutually beneficial transborderexchange of innovative ideas. The problem appears not only at the educational level but also in the interaction of innovators, representatives of small and medium business and other economic actors.

The existing economic division does not give hope for increase of the investment level in R&D by active economic players of the national economies of Romania and Ukraine. Therefore, it is necessary to form an institution on the territory of the program whose activities should be aimed at promoting and providing opportunities for innovative development within the JOP region. Such an institution is proposed by the Transborder Society of Innovators and Researchers (TSIR).

Effective activity of the TSIR implies the involvement of innovative activists (researchers, engineers, entrepreneurs). Such engagement is practically impossible without proposals from the TSIR side to support innovative ideas. Support at the information and legal level, attracting researchers to cooperation is a necessary, but insufficient condition to stimulate innovation development. To ensure the availability of modern hardware and elemental base, the development of contacts with suppliers of equipment, materials and components, is a necessary element. The Center of Innovation and Development “Know-How” (hereinafter referred to as CIDKH, CID) will serve as a tool to achieve this. First of all, CID is the premises on which the local TSIR center will be based. The room would be divided into two zones - the informational co-working area and technology zone. Informational co-working zone is the space, equipped with workplaces with a network connection. The technology zone is a space equipped with modern digital equipment for individualized production, automated tooling, components and consumable materials. The presence of a technology zone is a key condition for the innovative projects success, since without it the innovator can only receive information services that are equally available on the Internet. The implementation of the CID on both sides of the border will enable the work on joint projects, realizing them on the same technological basis. One of the main areas of the Center's activities will be training of the use of modern technologies, providing and improving the skills of working with CNC machines. Researchers will be able to create prototypes for the development of know-how and the establishment of a reasonable price in a non-specialized unit production. The available technological base and innovative expertise of participants in



the TSIR will provide a stimulus for innovation, a fundamental opportunity to implement the internal innovation potential of border areas.

Realization of innovative projects can act as a catalyst for investment in innovation by local population, the results of projects will be a clear reflection of the benefits of innovation development, their impact on improving the living standards of users and improving their economic ability. The probability of interest of potential investors in the R&D sector of the region will increase. The proposed scenario will reduce the impact of the gap between GDP and the investment gap between Romania and Ukraine. CID is one of the necessary elements to prevent the risk of increasing income differences and exacerbating the migration issue. The technological experience of the Romanian partners and the greater experience of Romania's integration into the EU is a valuable advantage of this partnership for Ukraine, while the high level of penetration of higher education on the Ukrainian side is its advantage in finding partners for the mutual implementation of projects with Romania.

## **POLEPSZANIE WŁAŚCIWOŚCI DROBNOZIARNISTYCH SUROWCÓW ENERGETYCZNYCH POPRZEC ICH BRYKIETOWANIE W PRASACH WALCOWYCH**

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Aglomeracja ciśnieniowa prowadzona w prasach walcowych jest obecnie kluczowym procesem technologicznym w wielu gałęziach przemysłu. Dotyczy to przede wszystkim sektora ciężkiego, chemicznego, farmaceutycznego oraz energetycznego. Głównymi zaletami tego typu maszyn są: ciągły charakter pracy przy relatywnie małym zapotrzebowaniu energii oraz dłuższa żywotność elementów formujących w porównaniu z innymi brykietarkami np. ślimakowymi czy stemplowymi. Zalety pras walcowych decydują o tym, że cieszą się one dużym zainteresowaniem. Chętnie sięga się do nich, projektując nowe linie technologiczne do ciśnieniowej aglomeracji materiałów sypkich. Rosnące zapotrzebowanie na prasy walcowe oraz konkurencja między firmami, w których projektuje się i wykonuje tego typu maszyny, spowodowały szybki rozwój ich konstrukcji. Prasy walcowe należą do grupy maszyn, które są projektowane i wykonywane dla ściśle określonych celów. Początkowo brykietowanie służyło tylko do nadania odpowiednich walorów użytkowych surowcom przede wszystkim pod kątem jego wielkości i kształtu np. miał węglowy brykietowano, aby doprowadzić węgiel do postaci kawałkowej i w ten