https://doi.org/10.18778/8331-401-3.02

Chapter 1

The Importance of Social Innovation in the Knowledge-based Economy

Małgorzata Jabłońska[1] (malgorzata.jablonska@uni.lodz.pl)
[1] University of Lodz, Faculty of Economics and Sociology, 90-255 Lodz, P.O.W. St. 3/5, Poland

1.1. The Importance of Social Innovation in the Innovation Ecosystem

Innovation is one of the determinants of economic development. Thanks to the implementation of new products, services and organisational changes into business practice, enterprises are able to compete effectively or satisfy various types of needs. Innovativeness, from the perspective of a single enterprise, is also perceived in financial terms. The implementation of innovative solutions should contribute to the improvement of business performance. The innovativeness of an enterprise is assumed to expresses the willingness and ability to implement new solutions, both of a technological and non-technological nature.[1] The attempt to define social innovation for the purpose of this study makes it impossible to omit issues related to the environment of innovation.

Innovation is considered the driving force of every economy, while in the micro scale, it correlates with development, competitiveness, learning process and change. The dynamics of changes taking place in the environment of each organisation forces the need for constant adaptation to new operating conditions, which directly accounts for the requirement to implement a new product, service or to restructure a company. Given the analysis of the literature on the subject in the field of innovation, it is plausible to state that there is terminological ambiguity in this regard. Researchers have still failed to develop a uniform definition of innovation, which often leads to misinterpretation. This is partly due to the fact

1 T. Kraśnicka, (2013), *Innowacyjność przedsiębiorstw – uwarunkowania organizacyjne*, Studia Ekonomiczne nr 136, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice, p. 168.

that the study of innovation is a relatively new research area to the extent of social sciences.

One of the most common definitions of innovation is developed by innovation pioneer JA Schumpeter who was the first to have introduced this conceptual framework to economic sciences. According to him, innovation should be understood as: introducing new products into the production or improving the existing ones, introducing a new or improved production method, opening a new market, using a new way of selling or purchasing, using new raw materials or semi-finished products, introducing a new organisation of production, a new organisational structure, e.g. creating a monopoly or breaking it up.[2] Among the current definitions of innovation, the one developed by the OECD bears noting since it takes into account a number of key features of innovation. In terms of economic practice, innovation means the implementation of a new or significantly improved product, service or process,[3] which has an impact on the development of entrepreneurship,[4] which, apart from competitiveness and innovation, has in recent years become one of the most important issues related to the economic growth of regions.[5] The innovativeness of a company is also defined as the search for solutions derived from science[6] or social need[7] for commercial purpose.

Due to the fact that innovation is a complex category and represents a multi-dimensional meaning, several classification types of innovation may be found in the related literature. One of the most important is its division into product-based, process-based, and organisational innovation. Product-based innovation means new or improved products, process-based innovation relates to new or improved production processes, while organisational innovation translates into changes in the management system.[8] This nomenclature is used by the OSLO Manual, hence its widespread use. In fact, however, there are still other classification types that are related to such criteria as: the functional area of the organisation, the degree of novelty, originality of changes or the mechanism of stimulating innovation.

---

2 W. Furmanek, (2017), *Innovations as the Category of Contemporaneity*, "Labor et Educatio", no. 5, Kraków, p. 17.

3 OECD, Eurostat 2008.

4 G. Avram, E. Hysa, (2022), *Education, Knowledge and Data in the Context of the Sharing Economy,* "The Sharing Economy in Europe"*,* Cham: Palgrave Macmillan, pp. 181–206.

5 M. Jabłońska, R. Dziuba, I. Hurak, (2018), *Czynniki rozwoju przedsiębiorczości w Polsce Wschodniej*, „Wiadomości Statystyczne", GUS, Warszawa, p. 57.

6 W. Furmanek, (2017), *Innovations as…*, p. 19.

7 A. Markowicz, (2019), *Innowacje społeczne jako determinanty rozwoju społeczności lokalnych,* "*Ekonomia Społeczna. Innowacje społeczne*", vol. 1, Uniwersytet Ekonomiczny w Krakowie, Kraków, pp. 32–40.

8 J. Tutaj, (2019), *Innowacje – próba pomiaru*, [in:] Z. Malar, J. Tutaj (eds), *Innowacje a dobrostan społeczeństwa, gospodarki i przedsiębiorstw:próba pomiaru*, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, p. 12.

Table 1.1. Innovation – Classification Types

1.	**Strategic, tactical**	**They** are put under consideration from the macro and micro point of view. Strategic innovation accounts for long-term projects with significant potential, priority for the company or the state. Tactical innovation comes forward with changes in products, technology, etc.
2.	**Creative, imitative**	They are put under consideration from the point of view of importance for the company and the economy. Creative innovation is called pioneering innovation and imitative innovation, i.e. adapted ones.
3.	**Radical, recombinant, modification**	Radical innovation gives rise only to new products, technologies and methods of management. Recombinant innovation is the use of existing technical solutions to create new solutions. Modification innovation consists in slight changes in already existing solutions. Such modification will not change the function of the product but the related characteristic feature is the response to the customers' needs and requirements in order to satisfy them.
4.	**Purposeful, instrumental**	Purposeful innovation consists brings about a completely new solution. Instrumental innovation constitutes a change in the system of production or management leading to a new goal.
5.	**Demand, supply**	Demand innovation arise from market needs (satisfying a market niche). Supply innovation comes from scientific and research outcome, often as a result of theoretical research, without any influence upon the market and consumer needs.
6.	**Single, synergistic**	Individual innovation is implemented and affects only one sphere of the company's business operations. Synergistic innovation impacts many areas of the company's business operations.
7.	**Employee, participatory**	Employee innovation comes forward with solutions initiated by employees as it arises from their creativity and the need for change. Participatory innovation brings about top-down solutions.
8.	**Technical, biotic, anthropocentric, social**	Technical innovation consists in modifications in the field of production technology. Biotic innovation means innovation in the field of nature. Anthropocentric innovation influences various aspects of human life. Social innovation impacts the organisation of interpersonal relations.

Source: own study based on: J. Tutaj, (2019), *Innowacje – próba pomiaru*…, p. 12.

The analysis of the definitional extent of the topical issue in question for the purpose of this study has underlain the decision to distinguish two models of innovation: social and economic. Economic innovation, that is a broader term, is associated with the implementation of improved products, a new product or the use of more efficient production methods as well as a new and more effective organisational framework that is tantamount to reorganising or restructuring a company in terms of a micro innovation as opposite to a macro one within the entire economy.[9] The table below displays a few of the most important definitions of economic innovation (covering the broad meaning of innovation) and concurrently presenting various aspects.

Table 1.2. Economic Innovation – A Variety of Definitions

Author	Definition of Economic Innovation
1	2
Skubiak B.	– consists in addressing major social concerns, based on entrepreneurial initiatives that emphasise philanthropy, individual responsibility and a limited role of the state. Social innovation is not only a response to specific needs, but also creates social changes, a new vision, a new way of perceiving and defining problems as well as solutions to those problems;
Gomulka S.	– seen as long-term investments;
Olejniczuk-Merta A.	– can be unpredictable, can be a by-product of solving other social problems; – it is also recognised as experimental social activities aimed at improving the quality of life of individuals, nations and entire communities; – contributes to improvement of the living standards; – it is the relationship between business, society and development;
NCBiR	– it is a solution which at the same time does not respond to social needs, and also causes a permanent change in given social groups. Those solutions may be related to innovative products, services or processes that provide for diverse solutions to typical social problems;
OECD	– a new or improved product is introduced to the market or a new or improved process is used in production;
Skonieczny J.	– a response to such social challenges as: ageing of the society, economic crisis, increase in unemployment among university graduates;
Praszkier R. and Nowak A.	– it is a precondition for the emergence of social entrepreneurship in the economic sphere;

9 S. Żero, (2018), *Różnice w interpretacji pojęć innowacji oraz imitacji*, [in:] E. Gruszewska, A. Matel, E. Kuzionko-Ochrymiuk (eds), *Współczesne problemy ekonomiczne w badaniach młodych naukowców*. T. 2, Zarządzanie organizacją, finanse i inwestycje, Polskie Towarzystwo Ekonomiczne, Białystok, p. 41.

1	2
Bannet E.	– the creation and implementation of new processes, products, services and delivery methods that result in significant improvements in results, efficiency, effectiveness or quality;
Popplow M.	– successful introduction of new services, products, processes, business models and ways of working;
Parker J.	– a process that includes all activities that bring a new product or manufacturing method to practical use;
Pomykalski	– a process covering all activities related to the creation of an idea, the creation of an invention as well as the implementation of the invention;
Lange O.	– these are changes in the production functions that allow the company to increase the profit that may be earned under given market conditions;
Johnston R.	– it is not only the first use of a product or manufacturing method, but also the subsequent use by other companies, industry sectors or countries;
Cossack M.W.	– a source of economic growth;
Poll E. and Ville S.	– intended to improve the company's performance and is usually protected by intellectual property rights; – economic innovation consists of technological innovation (new or improved products or processes) or organisational innovation.

Source: own elaboration based on: B. Skubiak, (2016), *Innowacje społeczne w teorii i praktyce*, Barometr Regionalny tom 14, nr 1, Wyższa Szkoła Zarządzania i Administracji w Zamościu, Zamość, pp. 29–30; A. Olejniczuk – Merta, (2013), *Innowacje społeczne*, Konsumpcja i Rozwój nr 1/2013, Warszawa, pp. 23–26; R. Praszkier, A. Nowak, (2012), *Przedsiębiorczość społeczna. Teoria i praktyka*, Oficyna a Wolters Kluwer business, Warszawa; J. Skonieczny, (2022), *Innowacja Społeczna*, „Zeszyty Naukowe Uniwersytetu Ekonomicznego w Poznaniu", nr (246), Poznań, p. 99; E. Bannet, (2007), *Quixotes, Imitations and Transatlantic Genres. Eighteenth Century Studies*, The Johns Hopkins University Press, Baltimowe, pp. 553–569; M. Popplow, (1998), *Protection and Promotion: Privileges for Inventions and Books for Machines in the Early Modern Period. History of Technology*, No 20, Bloomsbury, Londyn, pp. 103–124; *Oslo Manual – OECD Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*, OECD/EC/Eurostat 2005; J. Parker, (1974), *The Economics of Innovation*, London; A. Pomykalski, (2001), *Zarządzanie innowacjami*, PWN, Warszawa, p. 56; O. Lange, (1961), *Uwaga o innowacjach*, [in:] *Pisma ekonomiczne i społeczne 1930–1960*, PWN, Warszawa, p. 160; S. Gomułka, (1998), *Teoria innowacji i wzrostu gospodarczego*, CASE, Warszawa, p. 17; R. Johnston, (1966), *Technical Progress and Innovation,* "Oxford Economic Papers" 1966, vol. 18, iss. 2, pp. 158–176, za: P. Drucker, (1992), *Innowacja i przedsiębiorczość. Praktyka i zasady*, PWE, Warszawa, pp. 39–42; M.W. Kozak, (2008), *Czynniki determinujące możliwości wykorzystania polityki strukturalnej na potrzeby rozwoju polskich regionów*, [in:] K. Bondyra, M.S. Szczepański, P. Śliwa (red.), *WieloPolska Regionalna. Regionalizm w Polsce a polityka strukturalna Unii Europejskiej,* Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu, Poznań, p. 33; E. Pol, S. Ville, (2009). *Socialinnovation: Buzz word or enduring term?*, "The Journal of Socio-Economics", Vol *38*(6), pp. 878–885.

P. Drucker was one of the first researchers whatsoever when it comes to organisation and management processes in corporations and non-profit organisations, who defined social innovation. In his works, he emphasised the importance of social innovation and entrepreneurship. According to the researcher, the stimulus for innovation does not have to be any technical factor since market observations, demographic processes or social attitudes are often enough.[10] P. Drucker's indication of social aspects contributed to the search for links between innovation and social conditions of their development. He pointed out that innovation is a result caused in the economy by society.[11] Currently, the related literature is increasingly abundant as far as various types of references and examples of research on the social aspects of innovation are concerned. Having examined the related diverse literature, it may be concluded that the term "social innovation" has developed on the basis of such concepts as: institutional changes, social goals and public good.[12] The table below displays diversified approach to the definition of social innovation.

Table 1.3. Social Innovation – A Variety of Definitions

Author	Definition of social innovation
1	2
Skubiak B.	All types of scientific and technological innovation has an ex-ante or ex-post social component;
Olejniczuk-Marta A.	Any deliberate and conscious change into a new one that: – takes place in specific spatial and temporal conditions, – is expressed in material form or not, – is achieved thanks to activities different from routine, – involves additional effort and risk, – by nature and at least indirectly, it refers to the human being and society as the ultimate addressee of innovation;
Wiktorska-Święcka A., Klimowicz M. and Moroń D.	– the subject of social innovation is therefore a special type of change resulting from human dreams, desires and needs and efforts generated in the social environment;
European Union	– a response to social needs, especially those that are not traditionally met by the private sector or public institutions and are targeted at vulnerable groups in society; – social innovation is based on the ingenuity of citizens, civil society organisations, local communities, entrepreneurs and public officials;

10 W. Kwaśnicki, (2013), *Innowacje społeczne – nowy paradygmat czy kolejny etap w rozwoju kreatywności człowieka?*, [in:] W. Kwaśnicki (ed.), *Innowacyjność a samoorganizacja społeczna,* Uniwersytet Wrocławski, Wrocław, p. 9.

11 P. Drucker, (1992), *Innowacja i przedsiębiorczość. Praktyka i zasady*, PWE, Warsaw, p. 153.

12 E. Pol, S. Ville, (2009), *Socialinnovation: Buzz word or enduring term?*, "The Journal of Socio-Economics", vol. 38, no. 6, pp. 878–885.

1	2
Huczek M. and Smolarek M.	– is any intentional and conscious change into the new one, which takes place in specific spatial and temporal conditions, is expressed in a tangible or intangible form and refers to the human individual and society as the final recipient of innovation; – therefore, it has no limits, no time frames: is as useful and effective as it is useful to users in satisfying their needs: ranging from intangible to tangible ones;
Raufflet E.	– provide new knowledge to satisfy social needs;
Praszkier R. and Nowak A.	– creating and implementing new ideas for organizing activities or social relations in order to achieve common goals;
Edwards-Schachter M. and Wallace M.L.	– innovation that underlies the process of social change.

Source: B. Skubiak, (2016), *Innowacje społeczne w teorii i praktyce*, Barometr Regionalny tom 14, nr 1, Wyższa Szkoła Zarządzania i Administracji w Zamościu, Zamość, pp. 29–30; A. Olejniczuk – Merta, (2013), *Innowacje społeczne*, „Konsumpcja i Rozwój", nr 1/2013, Warszawa, pp. 23–26; A. Wiktorska-Święcka, M. Klimowicz, D. Moroń, (2015), *Zarządzanie innowacjami społecznymi,* Difin, Warszawa, p. 11; M. Huczek, M. Smolarek, (2018), *Innowacje społeczne w procesie zarządzania organizacjami*, „Zeszyty Naukowe Wyższej Szkoły Humanitas. Zarządzanie", Sosnowiec, p. 10; E. Raufflet, (2009), *Mobilizing business for post-secondary education*: CIDA university, South Africa, "Journal of Business Ethics", Vol. 89, pp. 191–202; M. Edwards-Schachter, M. L. Wallace, (2017), *Shaken, but not stirred: Sixty years of defining social innovation*, "Technological Forecasting and Social Change", 119(4), pp. 64–79.

The scientific literature distinguishes three different ways of defining social innovation:

- focusing on non-technical innovation in an organisational context,
- social innovation is combined with technological innovation,
- social innovation is considered to be independent and new social practices.[13]

So, what is the difference between social innovation and economic innovation? Social innovation, in addition to the above-mentioned features, is characterised by the fact that the benefits of this innovation accrue primarily to society as a whole, and not to private individuals.[14] In the case of social innovation, the goal of creating innovation is important, it is about satisfying new social needs, particularly in such areas as: education, health care, environmental protection, public finance or public and social services. Social innovation is the solution that contributes to solving social problems, in particular when all previous methods of solving those problems have turned out to be unreliable. As pointed out by Bukowski A. and others:

13 M. Huczek, M. Smolarek, (2018), *Innowacje społeczne w procesie zarządzania organizacjami*, Zeszyty Naukowe Wyższej Szkoły Humanitas, Sosnowiec, p. 11.

14 M. Wronka-Pośpiech, (2015), *Innowacje społeczne – pojęcie i znaczenie,* "Studia Ekonomiczne", Scientific Journals of the University of Economics in Katowice, No 212, Katowice, p. 127.

in the case of social innovation, what is important is the final goal it serves […], after implementation, the "social invention" is supposed to introduce a change consisting in increasing human well-being […], therefore social innovation should – in order to be recognised as such – positively affect the quality of life or increase key quantitative indicators related to human life. In this perspective, a social innovation can be both the Internet (which is also a technological innovation), a new medicine (which is also a business innovation), and a program to activate local communities. However, it cannot be those innovations that bring negative social effects or serve only business purposes without reference to a wider context […].[15] A similar approach to social innovation is also promoted by researchers Pol and Ville, according to whom economic innovation is profit-oriented innovation, which means creating new ideas with the intention of earning money. This does not mean, however, that social innovation does not generate revenues for the company because the vast majority of social innovation constitutes business innovation.[16] The Guide to Social Innovation indicates that social innovation includes:

- innovation that addresses the social needs of groups at risk of exclusion, traditionally not satisfied by the market and other institutions,
- innovation focused on sustainable development,
- innovation focused on organisational changes in relations between various institutions and their stakeholder groups.[17]

Given the above, although short and synthetic, it allows to define social innovation by means of the following criteria:

- new or improved solutions, the implementation of which results from a social need,
- usefulness does not result from a sudden market need, but from a social need, that so far could not be satisfied for various reasons;
- the implementation of this type of innovation is not massive;
- the goal is to create added value for society as a whole.

1.2. Innovation Booster in the Enterprise

Innovation involves a sequence of events, that generally begins with the emergence of an idea and ends with the introduction of a ready-made solution to the market through various commercialisation models. Due to the fact that innovation has

15 A. Bukowski, S. Rudnicki, J. Strycharz, (2012), *Społeczny wymiar innowacji*, "Zarządzanie Publiczne" No 2(20), Uniwersytet Ekoniiczny w Krakowie, Kraków, pp. 14–15.

16 E. Pol, S. Ville, (2009), *Socialinnovation: Buzz…*, pp. 878–885.

17 European Commission, *Guide to Social Innovation 2013,* pp. 6–7.

a very strong impact on economic and social development, it is worth looking at the process of boosting innovation in a company and the evolution of this phenomenon. Innovation has a real impact on the level of competitiveness.[18]

Innovation booster in the enterprise has undergone a significant evolution in connection with the scientific and technical development taking place over the centuries. Technical progress, i.e. the process of development changes manifesting itself through the introduction of new, improved machines, devices, tools, and new technologies to the production process, and through the use of existing resources in a more efficient way, was an important element of Schumpeter's theory of innovation and this approach is still valid today. Innovation is associated with change, and this in turn is the domain of the passage of time, and related progress in various areas of the economy. Technical progress consists of several basic stages which include: basic research, applied research, development and implementation. Importantly, does this classification apply to all four institutional sectors: the enterprise sector, the higher education sector, the government sector and the sector of private non-commercial institutions.

Table 1.4. Stages of the Technological Process

Definition	Technology Readiness Level
1	2
Basic Research – Experimental or theoretical work undertaken primarily to gain new knowledge of the underlying foundations of phenomena and observable facts without any particular application or use in mind. Basic research consists in the analysis of properties, structures and relationships, and the related goal is to formulate and test hypotheses, theories or laws. It is divided into clean and focused basic research. „Pure" basic research is conducted with the aim at developing background knowledge, with no purpose of achieving long-term economic benefits. „Targeted" basic research is conducted with the aim of creating foreground knowledge that may serve the purpose of solving problems or exploiting opportunities, both existing and anticipated.	Level I – the basic principles of a given phenomenon have been observed and described – the lowest level of technology readiness, meaning the start of scientific research in order to use the related outcome in future applications. Those may include, among others, the research into the basic properties of technology.

18 R. Dziuba, (2014), *Rola innowacyjności i konkurencyjności w rozwoju regionu Bałkanów Zachodnich na przykładzie Czarnogóry*, „Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania" 37/2, Wydawnictwo uniwersytetu Szczecińskiego, Szczecin 2014, p. 225.

1	2
Applied (Industrial) Research – Original research work undertaken to gain foreground knowledge. It is focused primarily on specific, practical goals (OECD def.); this is work aimed at acquiring foreground knowledge and new skills, developing new products, processes or services, or introducing significant improvements to them (def. Law on Higher Education and Science).	Level II – the concept of the technology or its future application has been defined. This means starting the process of searching for the potential application of the technology. From the moment of observing the basic principles describing the new technology, one can postulate its practical application, which is based on predictions. There is as yet no evidence or detailed analysis to support the assumptions made. Level III – critical functions or concepts of the technology have been confirmed analytically and experimentally. This means conducting analytical and laboratory tests to confirm the predictions of scientific research on selected elements of technology. Those may include components that are not yet incorporated into an integral whole or are not any representative of the entire technology, either. Level IV – components of the technology or its basic subsystems have been verified through laboratory testing procedures. That process means that the basic components of the technology have been incorporated. Those may include integrated 'ad hoc' models in the lab. A general mapping of the target system is performed through laboratory testing procedures. Level V – components or basic subsystems of the technology have been verified in an environment close to the real one. The core components of the technology are incorporated into real supporting elements. The technology may be tested under simulated operating conditions. Level VI – a prototype or model of a system or subsystem of technology is demonstrated in conditions close to real. This means that a representative model or prototype of the system, that is much more advanced, is tested at level V, in conditions close to real. Tests at this level include the prototype-based laboratory testing procedure imitating real conditions with high fidelity or in simulated operating conditions.

1	2
Development work – Work undertaken in a methodical manner, based on knowledge gained through research and practical experience and the foreground knowledge, aimed at developing new products or processes or improving existing products or processes (OECD def.). Activities involving the acquisition, combination, shaping and use of background knowledge and skills, including those in the field of IT tools or software, for planning production and designing and creating changed, improved or new products, processes or services, excluding activities involving routine and periodic changes introduced to them, even if such changes are improvements (def. Law on Higher Education and Science).	Level VII – a prototype of the technology is demonstrated in operating conditions. The prototype is almost at the operating system level. This tier represents a significant advance over Tier VI and requires demonstrating that the technology under development is operationally applicable. Research at this level includes testing prototypes on the so-called research platforms. Tier VIII – research and demonstration of the final form of the technology has been completed. This means that it has been confirmed that the target level of technology has been achieved and the technology may be used in the conditions envisaged for it. Practically, this level represents the end of the demonstration. Examples include testing and evaluating systems to validate design objectives, including those relating to logistics support and training. Level IX – checking the technology in real conditions proves the intended effect. This indicates that the demonstrated technology is already in its final form and may be implemented in the target system. Among other things, this is related to the use of developed systems in real conditions.
Implementation works – Works undertaken on the basis of the company's decision to use the results of research and development works, including the use of inventive projects, both own and acquired in the form of a license, related to the launch of production of new products or modernization of manufactured products and the introduction of new manufacturing methods, which precede the start of production on an industrial scale.	

Source: file:///C:/Users/user/Downloads/Poziomy_gotowosci_technologiczna.pdf (accessed: 12.02.2023; ustawa z dnia 20 lipca 2018 r. – Prawo o szkolnictwie wyższym i nauce (Dz.U. 2022 poz. 574, z późn. zm.); https://stat.gov.pl/metainformacje/slownik-pojec/pojecia-stosowane-w-statystyce-publicznej/10,pojecie.html (accessed: 12.02.2023); Podręcznik Frascati 2015, OECD; https://stat.gov.pl/metainformacje/slownik-pojec/pojecia-stosowane-w-statystyce-publicznej/340,pojecie.html (accessed: 12.02.2023).

Taking into account the definitional extent of basic, applied and development research, we have a broad definition of research and development (R&D), which is to be found in many EU strategic documents, national and international legal acts, etc. The order in which those three types of research and development activities appear should not imply that basic research leads to applied research and then to development. It has long been known that in the system of R&D activities there are many flows of information and knowledge, and the direction of transmission of those flows is also diverse. According to the authors of the Frascati handbook, development work may inspire basic research, and there is no reason to believe that basic research cannot lead directly to new products or processes.[19] Therefore, it should be recognised that the phase of basic research, applied research, development, implementation and diffusion overlaps one another, which is the result of the existence of links between each of them.[20]

Scheme 1.1. Linear Model of Innovation
Source: A. Kędzierska Szczepaniak, K. Szopik-Depczyńska, K. Łazorko, (2016), *Innowacje w organizacjach,* Texter, Warszawa, pp. 11, 16.

The Organisation for Economic Co-operation and Development (OECD) plays a key role in the correct interpretation of R&D activities. According to the OECD, "*R&D includes creative work undertaken in a methodical manner to increase the body of knowledge – including knowledge of humankind, culture and society – and to create new applications for existing knowledge*".[21] The key criterion for classifying R&D by type presented in the table below is the expected use of the related outcome.[22]

In order for a given activity to be classified as research and development activity, it is necessary to meet five basic criteria that determine the separation of this type of activity from other activities carried out in a given unit.

19 OECD, *Podręcznik Frascati 2015*, Główny Urząd Statystyczny, Warszawa 2015, pp. 47.
20 A. Kędzierska Szczepaniak, K. Szopik-Depczyńska, K. Łazorko, (2016), *Innowacje w organizacjach,* Texter, Warszawa, pp. 11, 16.
21 OECD, *Podręcznik Frascati…*, p. 48.
22 Ibidem, p. 56.

Table 1.5. R&D Classification Criteria

Criterion	Description
Focusing on new discoveries	Universities and research institutes – R&D activities are expected to generate completely new foreground knowledge and advanced background knowledge; Enterprises – as part of R&D activities, achievements, that are new to the enterprise and are not yet used in a given industry, are expected;
Relying on original, non-obvious concepts and hypotheses	R&D must aim at new concepts or ideas that add up to the background knowledge. Routine activities are excluded from the scope of R&D, and new methods developed for the purpose of performing are included in common tasks.
Uncertainty about the final result	R&D involves uncertainty because at the beginning of an R&D project, the type of result and the cost (including time spent) cannot be precisely identified in relation to its objectives. There is uncertainty about the cost or time needed to achieve the expected results.
Planning and budgeting	Research and development activities are formal activities carried out in a methodical manner. This means that R&D is carried out in a planned manner, with both the course of the process and its outcome being recorded. In order to verify this, it is necessary to specify the purpose of the R&D project and the sources of funding for research and development work. The availability of such documentation is consistent with an R&D project that is aimed at meeting specific needs and for which own human and financial resources are available.
Leading to results that can be played (possible to transfer or restoration)	An R&D project should result in the potential to transfer foreground knowledge, ensuring its exploitation and allowing other researchers to replicate the results as part of their own R&D. Since the purpose of R&D is to develop the background knowledge, the results must not remain muted (i.e. they cannot remain only in the minds of researchers), as there is a risk of losing both those results and the knowledge associated with them.

Source: own study based on: OECD, *Podręcznik Frascati 2015*, Główny Urząd Statystyczny, Warszawa 2015, pp. 49–50.

In consideration of the above, it should be pointed out that the inception of the innovation booster should begin with the correct definition of phenomena or events that are likely to occur in the course of developing innovation. As mentioned earlier, models of innovation booster processes have evolved from Schumpeter's time until the present day. Currently, the most known classification of innovation booster is proposed by R. Rothwell in the early 1990s. He systematised innovation booster processes in an enterprise and distinguished five generations of models of innovation booster processes.[23]

Table 1.6. Models of Innovation Booster Process, according to R. Rothwell

Booster Model	Properties
1	2
Technology-driven innovation model (supply-driven model) From the 1950s to the mid-1960s	– is based on the concept developed by JA Schumpeter; – innovation is limited to research and development (R&D); – the initiator of innovation booster activity is the R&D staff; – assumes that the supply of innovation is determined by the state of knowledge and the tendency of independent explorers to constantly search for new solutions; – innovation booster activity stems from the current development of basic research and an appropriate R&D potential; – Entrepreneurs incur a certain risk through innovation, expecting future benefits. The implementation of innovation will change the structure of the market, giving a temporary monopolistic position and extraordinary profits to innovators. This will result in the emergence of imitators (diffusion) and will adversely impact the privileged position of enterprises by increasing market competition; – the form of the supply model according to the sequence of events: research – design and engineering – production – sale; – the model has worked well in absorptive economies where the entrepreneur does not have to solicit customers (the so-called first-generation model); – shows the features of a linear model;

23 K. Kozioł, (1992), *Modele procesu innowacyjnego w przedsiębiorstwie*, „Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania" No 6, 2008, p. 523, [in:] R. Rothwell, (1992), *Successful Industrial Innovation: Critical Factors for the 1990's*, "R and D Management", no 22.

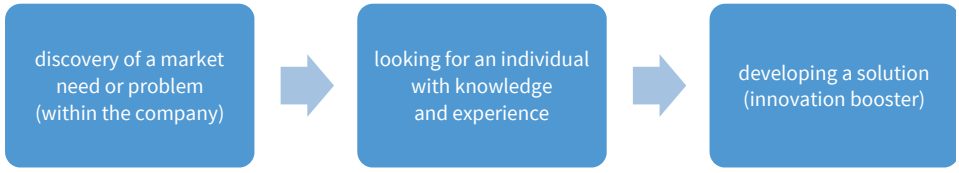
1	2
Model of innovation pulled by the market (demand model) From the mid-1960s to the early 1970s	– the market is the main source of ideas and inspiration for R&D activities, which is why this model works well in economies where the market decides which product will be accepted by the customer and which will be rejected; – the most important, from the point of view of the company's business operations, is the staff dealing with marketing, i.e. recognising market needs; – the success of the company is based on the ability to anticipate short-term changes and needs in the market and to capture potential opportunities for new products among them; – innovation is treated as a response to new, economic opportunities to maximise the company's profit; – the level of innovation booster activity is determined by the expectation of a higher market value of a new or improved good, which depends on the current size and the expected growth rate of the market capacity in which new products will be sold; – the form of the demand model according to the sequence of events: market need – product development – production – sale (the so-called second generation model); – shows the features of a linear model;
Feedback model From the early 1970s to the mid-1980s	– innovation treated as a logically sequential process that consists of functionally separate but coupled and interdependent phases. The birth of a new idea may take place both after a new need in the market has been recognised and as a result of R&D activity. What is important in this model is the mutual penetration and interaction of market needs and R&D activities (the so-called third generation model); – it is a non-linear model;
Integrated/parallel model From the early 1980s to the early 1990s	– the model has been implemented in economic practice as a result of rapid technological development; – the creation of new products is based on design teams combining various functions. Under this concept, features are introduced into the new product development process from the very beginning (the so-called fourth generation network model);

Table 1.6 (cont.)

1	2
Network model From the mid-1990s	– companies increasingly rely on external innovation resources in the booster innovation process; – shift from own core business and R&D in favour of, for example, selected aspects of R&D in favour of buying ready-made outcome; – enterprises assume the role of an integrator, handling the innovation booster process and development activities carried out by partners (the so-called fifth generation model);

Source: own study based on: M. Zastępowski, (2017), *Model procesu innowacyjnego Polskich małych i średnich Przedsiębiorstw*, „Organizacja i Kierowanie", nr 2, SGH, Warszawa, p. 372; R. Ciborowski, (2012), *Modele rozwoju innowacyjnego*, [in:] *Ekonomika i zarządzanie innowacjami w warunkach zrównoważonego rozwoju*, edited by Andrzej H. Jasiński and Robert Ciborowski, Białystok 2012, pp. 49–50.

The models of the innovation booster process presented above, from the supply model to the integrated model, are closed models, which means that individual enterprises use only their own internal resources to pursue innovation. Often is such an innovation booster procedure based on the know-how of employees who, through their own experience and knowledge, are able to penetrate the market need, create a theoretical outline of the solution to a given problem or market need, and then, with the involvement of other resources within the company, develop a prototype. Currently, innovation is created most often in connection with "assignment from the outside". This trend was started in 2003 by H. Chesbrought who observed that more and more companies used external sources to conduct innovation booster activities. He described such events as open to innovate.[24] In other words, they are network models, self-learning systems that generate knowledge and initiate the learning process, aimed at connecting internal and external ideas, as well as internal and external innovation paths to the market, which accelerates the development of new technologies. The open innovation model emerged in the early 2000s and continues until now.



Scheme 1.2. Open Innovation Booster (sixth generation innovation)
Source: own study.

24 M. Zastępowski, (2017), *Model procesu innowacyjnego Polskich małych i średnich Przedsiębiorstw*, „Organizacja i Kierowanie", nr 2, Szkoła Główna Handlowa, Warszawa, p. 374.

The effective implementation of innovation when it comes to business operations and the range of its impact have a fundamental significance as far as the social effectiveness of science and the pace of economic development are concerned. Both from the point of view of business practice and the related literature, the implementation of innovation is considered to be the weakest element of the innovation process. It often turns out that innovators lack managerial tools or skills, and managers, in turn, lack knowledge in the field of commercialisation know-how. The innovation implementation procedure itself is different, depending on the type of innovation, which may be as follows:

- product – introduction of a product or service that is new or significantly improved;
- process – implementation of a new or significantly improved method of production or delivery;
- marketing – implementation of a new marketing method involving significant changes in product design/construction or packaging, distribution, promotion or pricing strategy;
- organisational – implementation of a new organisational framework in the operating principles adopted by the company.[25, 26]

The above also applies to social innovation that may include products, services, processes, technologies, organisational frameworks, business models, social movements, etc. Examples of social innovation are presented in the table below.

Table 1.7. Social Innovation Types

Social Innovation	Examples
product	technologies that assist people with disabilities
service	microcredit, mobile banking
process	peer-to-peer cooperation model, crowdsourcing
market	Fair Trade, time banks
organizational	social enterprises
new business models	social franchise, the use of JIT (just-in-time) strategies for social challenges
new platforms	new models of care for people with intellectual disabilities and those in „social isolation"

Source: M. Wronka-Pośpiech, (2015), *Innowacje społeczne – pojęcie i znaczenie*, Studia Ekonomiczne. „Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach", nr 212, Katowice, p. 129.

25 OECD, (2005), *Oslo Manual, Guidelines For Collecting And Interpreting Innovation Data, Third Edition*, European Commission, pp. 50–53.

26 A. Kędzierska Szczepaniak, K. Szopik-Depczyńska, K. Łazorko, (2016), *Innowacje…*, p. 11.

The process of creating and implementing social innovation in economic practice does not differ significantly from a typical innovation process. In the related literature, however, the process of delivering social innovation is treated separately, which is why six stages of the innovation booster process in this case are distinguished:

- inspiration;
- proposal;
- prototype;
- maintenance;
- scaling;
- systemic change.[27]

The "inspiration" stage is associated with a social need that arises suddenly and unexpectedly, e.g. as a result of a natural disaster, contributing to the occurrence of a social need that has not been satisfied so far. Inspiration may also refer to a social need that has not been satisfied despite the fact that a market need actually exists, e.g. the problems of an ageing society. This "non-satisfaction" of the social need may have occurred because the implementation of this type of innovation is unprofitable for a typical enterprise. It means that the identification of a social need, regardless of the circumstances of its occurrence, is parallel to the achievement of the sowing phase of an innovative idea.

The second stage, "proposal", comes forward the development of a preliminary concept to address a social problem. It is responsible for conceiving ideas brought forward by citizens and consumers of services, the local community, employees of organisations or members of social organisations. This is a time-consuming step. Due to the fact that the purpose of social innovation is to satisfy specific social needs, it is necessary to reach the social group most interested in a given innovation.

The "prototype" stage includes pilot studies aimed at checking whether the proposed solution to a social problem is acceptable to users. From the point of view of the organiser of the innovation booster process, this is the most difficult stage. It covers time-consuming and cost-intensive conceptual work (corrections to the prototype, substantive consultations) as well as activities related to, for example, searching for funding sources for subsequent stages of the prototype development.

The "maintenance" stage means the popularisation and implementation of innovation, which ends with the development of a prototype that meets social expectations. At this stage, the owners of the innovative conceptual framework should develop a business model based on which its commercialisation will take place.

The "scaling" stage consists in the diffusion of innovation among groups and communities interested in changing, purchasing, implementing the proposed innovative conceptual framework (e.g. through franchise or licensing).

27 http://www.socialinnovator.info/process-social-innovation (accessed: 12.02.2023).

The last stage, i.e. "systemic change", consists in implementing new ways of thinking and acting that relate to various areas of social life. At this stage, the social changes that have taken place after the implementation of innovation are often assessed. Systemic changes make up social innovation that has contributed to changes in the existing education, health and information systems and has brought about new and better behaviour of people.

1.3. Social Innovation Booster Pre-conditions and Implementation Prospects

Social innovation addresses the challenges emerging in the social system. The onset of each innovation of this type should be seen in the ongoing change, starting from a change of thinking and ending with a change related to technical and economic progress. Social innovation refers to many areas of social life, e.g. education, management or culture. However, the undoubted ally and cause of social innovation in each of the above-mentioned areas is knowledge, which is a key value of social life. As it has already been emphasised in the previous part of the study, for an innovation to be considered socially innovative, it should have the following attributes:

- novelty,
- dissemination of the effect,
- effectiveness,
- addressing a social need,
- boosting social activity to action.

Social innovation promotes the competitiveness of the EU and its regions that are well-positioned to play a leading role to this end. Regional authorities can arrange for this process. They can take the lead in promoting social innovation, provide funding, bring together diverse stakeholders, introduce strategic thinking, and support the generation of fresh ideas to address societal and societal challenges. In order for social innovation to develop, there is a real need to support the related development at the central level, so one of the most important pre-conditions for the development of this type of innovation is to create a favourable environment. A special role in this respect is played by governments and the policy of central authorities at various levels. The United States has good practices in this regard. In 2009 the Office for Social Innovation was established and $50 million was allocated for its operation. The following year, upon the initiative of the then President, the Office of Social Innovation and Civic Activity was launched, the mission of which

was to improve opportunities, equality and justice by helping to create a social sector. The Social Innovation team is working to identify and scale better, more effective social solutions to deliver on the priorities of the President of the United States that strengthen communities and provide for economic advancement.[28] In 2014 the Social Innovation Found was established. The fund combined public and private funds to develop solutions based on societal needs. Social needs financed under the Fund included activities in the field of: generating new economic opportunities, healthy future and youth development.[29] Through the efforts of this Fund, $350 million of private and non-federal commitments have been raised to fund social innovation activities.[30] The European Union has similar experience in supporting the idea of social innovation at the central level. Social innovation is incorporated into numerous policy initiatives of the European Commission, which translates into regulations governing the Structural Funds. In each previous and current programming period, specific measures are accessible for the development of social innovation. Within the financial perspective 2014–2020, the Horizon 2020 Programme has been the largest instrument in terms of allocation of funds aimed at financing the development of research and innovation. The Programme deliverables include the achievement of 3% of the GDP for financing research and development in the Community by 2020. It has consisted of three mutually complementary priority areas: an excellent scientific base, a leading position in industry, and social challenges (it has emphasised the need for social innovation to the greatest extent).

The vast majority of social innovation stems from the initiative of a single citizen or various types of organisations, the core business of which is to deal with the identification of social needs. It is the output of a process that consists of:

- identification of social needs,
- creating new solutions,
- evaluation of the effectiveness of those solutions,
- monitoring effectiveness in practice.[31]

The development and implementation of social innovation, like any other type of innovation, requires the delivery of a model that would mark the most important milestones throughout the process. The model developed by the European Commission includes the ten most important steps to be taken when implementing social innovation.

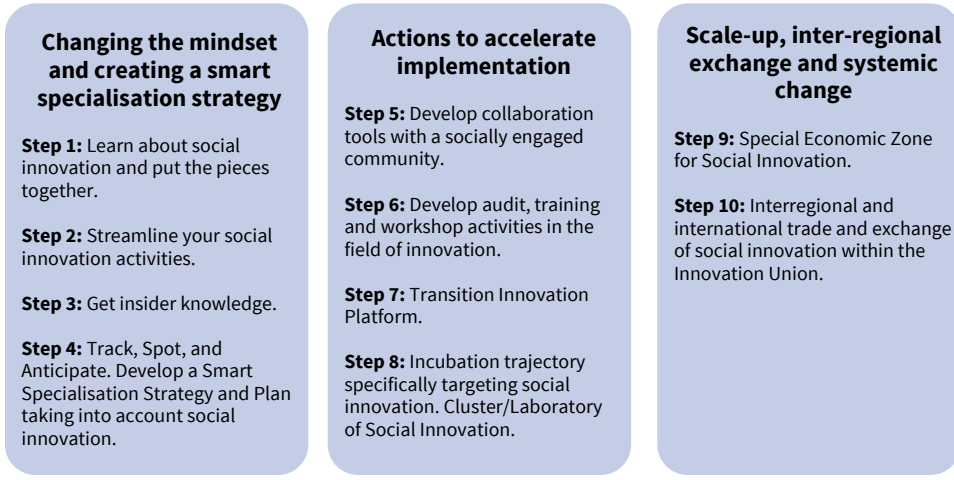
---

28 https://obamawhitehouse.archives.gov/administration/eop/sicp/about (accessed: 18.03.2023).

29 https://obamawhitehouse.archives.gov/administration/eop/sicp/initiatives/social-innovation-fund (accessed: 18.03.2023).

30 W. Kwaśnicki, (2014), *Jak wspierać rozwój innowacji społecznych?*, [in:] A. Olejniczuk-Merta (ed.), *Innowacje społeczne od idei do upowszechniania efektu*, Instytut Badań Rynku, Konsumpcji i Koniunktur, Warszawa, p. 29.

31 K. Zajda, (2014), *Uwarunkowania innowacji społecznych w społecznościach wiejskich i metody ich stymulowania*, [in:] E. Psyk-Piotrowska (eds), *Nowe mechanizmy rozwoju obszarów wiejskich*, Uniwersytet Łódzki, Łódź, p. 145.



Scheme 1.3. Milestones in the process of developing and implementing social innovation
Source: *Guide to Social Innovation 2013*, European Commission, p. 60.

Implementation of social innovation is carried out through the performance of activities within three basic areas: changing the way of thinking, leading to implementation and accelerating implementation, and increasing access to social innovation. The European Commission indicates that social innovation should be implemented in areas such as:

- preparation of a strategy and action plan for social innovation in connection with the region's smart specialisation strategy;
- building capacity for social innovation by supporting new organisations and adapting existing ones;
- strengthening the social innovation market and encouraging cross-sectoral cooperation by using the power of public procurement to encourage innovative and cross-sectoral approach;
- supporting innovators to start and grow through business support measures and encouraging innovation in the workplace;
- investing in new financing models at every stage of the innovation process, specifically in financing pilots, implementation and scaling;
- establishing better structures for social innovation performance measurement, evaluation, benchmarking and comparison of existing and proposed policies and projects;
- promoting exchange and learning on social innovation approach across Europe.[32]

32 European Commission, *Guide to Social…*, p. 72.

1.4. The Role of Social Innovation in Ensuring the Societal Security

The introduction of new, significantly improved products or processes is crucial for increasing efficiency and improving the societal security. The cause of innovation is often the change in products or services from the point of view of improving the safety of their users. Innovation is essential to thrive in today's competitive and dynamic global economy. For this reason, innovation has become the focus of attention of the European Commission, which, both in the previous and in the current financial perspective, are one of the most important areas of supporting the development of European regions.

The safety of innovation may be considered from two perspectives: a single use of innovation and an enterprise that implements innovation due to the desire to improve the economic standing. Both spheres are governed by law. A relevant part of the statutory law and related regulations entail executive regulations to be enforced by the public administration and authorities in order to influence market activity and the behaviour of private entities in the economy. A wide range of regulations may affect the innovation booster activity of both enterprises and even the entire economy because they directly cover such areas as: trade and customs, financial issues, corporate governance, accounting and bankruptcy, intellectual property law, health and security issues, employment and labour market, immigration, environment and energy.[33] The effects of implementing social innovation, that have an impact on the economy, society or the environment, result from the goals set in the field of innovation, aimed at external outputs, such as reducing the environmental impact of activities or improving health and security. Other headings cover the contribution of innovation to broader societal goals such as social inclusion, public safety and gender equality.[34]

Social innovation in the area of safety to a great extent addresses the improvement of the safety of inhabitants in inhabited areas, safety of products, and safety at work. As far as the first of the above-mentioned areas is concerned, in recent years, activities based on cooperation with progressive municipalities and activation of local communities to the extent of the safety of residents have been successfully completed. As an example of such activities the city of Poznań may serve, where in 2018 the process of building and increasing the safety of city residents was launched through the following initiatives:[35]

33 https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5496/18/1/1/podrecznik_oslo_2018_internet.pdf (accessed: 02.04.2023).

34 https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5496/18/1/1/podrecznik_oslo_2018_internet.pdf (accessed: 02.04.2023).

35 https://badam.poznan.pl/2018/ii_nasza-przestrzen/08_bezpieczenstwo/programy-w-zakresie-zwiekszenia-bezpieczenstwa-mieszkancow-poznania/ (accessed: 02.04.2023).

- "Seniors – personal safety" – the programme aimed at raising awareness among seniors about safety, experience exchange, and promotion of safety in everyday life. As part of the project, meetings were organised in housing estate clubs, senior clubs, and day care centres, during which the risks to which seniors may be exposed in everyday life were discussed. It was also indicated how to proceed in emergency cases and how to avoid them;
- "Safe district – safe resident" – under this initiative, 60 meetings were organised at police stations. The topics of the meetings covered security and public order, problems and concerns of local communities and analyses of possible actions and implementation of action plans set out by the councils of housing estates to successfully address the immediate problems;
- "Cheer safely" – the goal was to prevent problems and teenage behaviour concerns, as well as to promote correct social attitudes of young people, eliminating aggressive behaviour and promoting the principle of fair play, and thus teaching cultural participation in mass sports events;
- "School free from drugs and violence" – the aim was to introduce and implement uniform forms of cooperation among school, parents, and students as well as the police and municipal guards aimed at counteracting addiction, and in particular preventing phenomena related to drugs and violence among minors;
- "Ensuring safety in water areas" – Preventive and educational activities were carried out in cooperation with the Police, the City Guard of the City of Poznań, namely surveillance of dangerous places, including places usually used for swimming, bathing and practising water sports, and raising awareness of the risks associated with use of water areas;
- "I know how to save lives" – the aim was to expand the education and training of children and the youth through acquisition of knowledge and practical skills in the field of first aid, including particularly cardiopulmonary resuscitation;
- "Detector in every home" – the aim was to promote fire safety by running a campaign to raise awareness of the desirability of installing smoke and carbon monoxide detectors as well as gas and LPG detectors that save health and life.

Improving work safety is an increasingly conscious choice of entrepreneurs, especially in the context of improving their efficiency, economic indicators or social benefits, because a modern enterprise must meet the growing requirements, both economic and social. Occupational safety may be defined as a state of work consisting in work performance in conditions that are not hazardous to the health and life of employees. Employers' activities in the field of safety are aimed at preventing accidents at work and improving working conditions so that they do not become harmful to health.[36] Examples of solutions to increase work safety are:

36 A., Kreml, (2014), *Innowacyjność w sferze bezpieczeństwa i higieny pracy jako czynnik rozwoju biznesu*, "Państwo i Społeczeństwo Państwo i Społeczeństwo", vol. 14, no. 3, Kraków, pp. 87.

- new or significantly improved methods of creating and providing services to improve work safety;
- significant changes in hardware and software to improve work safety;
- changes in the procedures and techniques used to provide services;
- new or significantly improved techniques, devices and software in support activities;
- innovation in the organisation of the workplace – they consist in the implementation of new methods of division of tasks and decision-making powers;
- new organisational methods in the field of relations with the environment consisting in the implementation of new ways of organising relations with the environment.[37]

1.5. Possible Funding Sources for Social Innovation in the Programming Period 2021–2027

The role of innovation in the new programming period is increasing as its cross-sectoral and international nature is also emphasised. The European Commission expects national authorities to prepare research and innovation strategies to use funds more efficiently and to increase synergies between the EU and national policies and public and private investments. Smart Specialisation Strategy is the tool of the Innovation Union Initiative. It is a new concept aimed at identifying competitive advantages of regions. This strategy is to direct the development of innovation through the transfer of funds to regions where entrepreneurship is developed in accordance with the established directions of development.

Social innovation is integrated into many policy programmes and projects of the European Commission. They are implemented in particular to combat poverty and social exclusion, to stimulate entrepreneurship and social entrepreneurship, to promote employment, and to improve the well-being of the elderly.[38]

Poland is a beneficiary of the fourth perspective of the EU funds in the programming period 2021–2027. In the current financial perspective, EUR 72.2 billion will be allocated to the cohesion policy, while EUR 3.8 billion will be available from the Just Transition Fund.[39] The target measures co-funded with those funds are

37 Ibidem, pp. 90–91.

38 https://s3platform.jrc.ec.europa.eu/documents/20182/84453/Guide_to_Social_Innovation.pdf (accessed: 12.02.2023).

39 https://poland.representation.ec.europa.eu/strategies-and-priorytety/key-dzialania-eu-for-polskie/polityka-spojnosci_pl (accessed: 09.03.2023).

specified in the Partnership Agreement that defines strategic priority areas from the point of view of effective use of the EU Funds. Those priority areas include: social, economic, environmental and territorial.[40] The document in question defines 6 objectives of the cohesion policy for the programming period 2021–2027:

Goal 1: A more competitive and smarter Europe.
Goal 2: A greener, low-carbon Europe.
Objective 3: A better connected Europe.
Objective 4: A more social Europe.
Objective 5: Europe closer to citizens.
Goal 6: Mitigating the effects of the transition towards a climate-neutral economy.[41]

From the point of view of the goals met by social innovation, projects that could contribute to social development may be found in any of the above-mentioned areas. However, it should be borne in mind that each of the listed goals has a specific system of challenges that defines the strategic, common goal of all projects that will be implemented in a given area. In addition, the intended measures are specified in detail as they are to contribute to the achievement of the objective set out in the Partnership Agreement and the results that should be the effect of the actions taken in order to deliver on the strategic objectives.

The European Funds for Modern Economy Programme (FENG) constitutes one of the Programmes under which the objectives of the cohesion policy will be implemented in the years 2021–2027. The FENG is the successor to the Smart Growth Programme implemented in the previous financial perspective as the innovation booster programme dedicated to entrepreneurs. The Programme places great emphasis on research and development (R&D). Under the Programme it will be possible to finance projects responding to the greatest civilisation challenges. The support is intended for enterprises that want to develop research and development infrastructure, finance high-risk projects or support the "green" and digital transformation of enterprises. The FENG also supports joint research projects for entrepreneurs and research organisations to enable them to develop innovative ideas. The strategic objective of the FENG Programme is to increase the potential in the field of research and innovation and the use of advanced technologies, increase the competitiveness of SMEs, develop skills for smart specialisation, industrial transformation and entrepreneurship, and transform the economy towards Industry 4.0 and green technologies. The FENG priority areas cover:

- National Smart Specialisations (KIS);
- cooperation between science and business;
- support for entrepreneurs at every stage of development;
- support for the entire R&D&I process.

40 https://www.fundusze Europejskie.gov.pl/media/109449/umowa_partnerstwa_broszura_210x210_nowa_3-small.pdf (accessed: 09.03.2023).
41 Ibidem.

Table 1.8. Cohesion Policy Objectives for 2021–2027

The Goal of the Cohesion Policy	Strategic Objectives	Challenges	Planned Activities	Results
1	2	3	4	5
Goal 1: A more competitive and smarter Europe	– Increased importance of research and innovation and the use of advanced technologies; – Strengthening the potential of enterprises and public administration for a modern economy; – digitisation;	– Technological progress in all sectors of the economy; – The use of digital technologies and new business models in enterprises; – Internet speed of at least 100 Mb/s for everyone;	– Support for all stages of creating innovation in enterprises; – Digitisation of enterprises and the public sector; – Construction of an ultra-fast broadband network for all households (in rural and urban areas);	– Expansion of research, development and innovation activities of enterprises; – Increasing the automation and robotisation of enterprises; – Providing access to broadband Internet to as many households and businesses as possible.

1	2	3	4	5
Goal 2: A greener, low-carbon Europe	– Energy efficiency and reduction of greenhouse gases; – Support for the production of energy from renewable sources; – Support for energy infrastructure and smart solutions; – Adaptation to climate change; – Sustainable water and sewage management; – Circular economy and resource efficiency; – Protection of natural heritage and biodiversity; – Low-emission transport and urban mobility;	– Reducing greenhouse gas emissions; – Reduction of CO2 emissions; – Reliability and stability of energy supply; – Extreme weather phenomena; – Appropriate treatment of municipal wastewater; – Reducing the amount of waste generated; – Unsatisfactory conservation status of endangered species and natural habitats – Ensuring better access to public transport for inhabitants of urban areas;	– Improvement of energy efficiency of enterprises, residential buildings and public utility buildings; – Construction or reconstruction of the grid into smart grids that enable the receipt of energy from RES; – Investments in energy infrastructure; – Support for management and improvement of nature protection systems; – Development of infrastructure for cyclists and pedestrians as well as public transport;	– Decrease in energy consumption in the housing and business sectors; – Increase in the share of RES in final energy consumption; – Improvement of the quality and security of the functioning of the power grid; – Increase in retention capacity (also natural), including small retention; – Improving the efficiency of drinking water and municipal sewage management; – Improving the efficiency of municipal waste management; – Strengthening the protection of biodiversity and natural ecosystems; – Better organisation of collective transport in cities and improvement of its accessibility.

Table 1.8 (cont.)

1	2	3	4	5
Objective 3: A better connected Europe	– Transport;	– Reduction of deficits in the infrastructure of the transport network; – Introduction of an integrated approach to transport planning and organization; – Ensuring the availability of transport; – Reducing the number of casualties and injured people, especially in road accidents; – Reducing CO_2 emissions and the environmental impact of transport;	– Development of land and water transport infrastructure (in the Trans-European Transport Network and beyond) with priority for the development of railways; – Integration of different modes of passenger and freight transport; – Implementation of investment and educational activities in the field of security; – Implementation of investment activities in the field of charging or refuelling infrastructure for alternative fuels for zero-emission vehicles;	– Creation of a multimodal (combining different modes of transport) transport system with a high level of safety and lower environmental impact; – Reducing disproportions in the transport accessibility of Polish voivodeships; – intermodal passenger and freight transport; – Increasing the accessibility of transport points/hubs for people with reduced mobility and disabilities.

1	2	3	4	5
Objective 4: A more social Europe	– Labor market, human resources; – Education, training, skills; – Social inclusion and integration; – Healthcare; – Culture and tourism;	– Strengthening the adaptability of enterprises and employees in response to dynamic changes on the labor market; – Raising the level of skills and qualifications of the society; – Reducing poverty and social exclusion; – Greater access to health services, taking into account the differences between regions; – Strengthening the role of culture and tourism for economic; development and social cohesion;	– Activation of unused labor resources; – Disseminating and improving the quality of pre-school education; – Supporting people at risk of poverty or social exclusion; – Improving the quality of health services; – Maintenance and modernisation of cultural heritage sites;	– Higher level of employment of people in a difficult situation on the labor market; – Development of „soft" and pro-innovative competences of students; – Increasing access to services related to taking up a job or changing a profession for people at risk of poverty or social exclusion; – Increase in the quality and accessibility of health services; – Increasing the tourist attractiveness of regions and the country.

Table 1.8 (cont.)

1	2	3	4	5
Objective 5: Europe closer to citizens	– Europe closer to citizens;	– Rebuilding local economies, especially in the face of the epidemic crisis; – Little influence of local communities on the development of boroughs and districts; – Accelerating the development of areas in the most difficult socio-economic situation; – Development of competences of local authorities (planning and implementation of development policy); – Strengthening social capital; – Inverting the pyramid of health benefits;	– Actions addressed to less developed areas – strategic areas; – interventions, including medium-sized cities losing their socio-economic functions; – and areas at risk of permanent marginalization; – Supporting local governments and bottom-up initiatives in the preparation of territorial strategies; – Implementation of integrated projects; – Use of territorial instruments such as ITI, CLLD and IIT;	– Transformation of local economies; – Strengthening functional links between rural areas and cities; – Participation of local stakeholders in planning socio-economic development.

1	2	3	4	5
Objective 6: Mitigating the effects of the transition towards a climate-neutral economy	– Europe on the way to a climate-neutral economy.	– Mitigating the effects (on society, employment, the economy and the environment) of the transition to a climate-neutral economy; – Increasing the investment attractiveness of „coal" regions; – Reducing greenhouse gas emissions and increasing energy efficiency.	– Assistance for small and medium-sized enterprises in developing their activities, especially in innovative industries; – Support in the „green energy" sector and the reduction of low emissions; – Change and improvement of employees' qualifications; – Revitalisation and decontamination (decontamination) of post-mining and post-industrial areas; – Increasing the availability of selected public services.	– Modernization of labor markets in the areas of „mining transformation" understood as creating jobs in sectors unrelated to mining and conventional energy; – Preparation of investment areas in areas with mining and conventional energy; – Maintaining (or increasing) the level of professional activity of the inhabitants of the areas of „mining transformation" and limiting the phenomenon of depopulation of these regions.

Source: own study based on: https: //www.fundusze Europejskie.gov.pl/media/109449/umowa_partnerstwa_broszura_210x210_nowa_3-small.pdf (accessed: 09.03.2023).

The programme consists of four priority areas. The most important information for entrepreneurs on funding sources for innovation to be successfully implemented into the economic reality is described below.

Priority I – Support for entrepreneurs.

Specific objective: RSO1.1. Developing and strengthening research and innovation capacity and the use of advanced technologies (ERDF).

Measures designed to be financed under the specific objective cover the support provided directly to entrepreneurs (the so-called tailor-made support) as part of the possibility of implementing comprehensive projects consisting of the following modules:

- Module – R&D – The applicant may obtain funding for all or selected elements of the research process – from industrial research, through development work, including the creation of a demonstrator/prototype, testing it to the extent provided for in the GBER. Multiple stages of research and development work may be carried out under the project if it is necessary to achieve commercialisable effects. The result of the R&D module should be the development of innovation that is feasible to be implemented in business. The level of co-financing under this module is: 70% of expenditure on fixed assets, materials and construction works as well as intangible assets (the level of support results from the Regional Aid Map), 50% of expenditure on consulting services, including those supporting innovation, and 100% of expenditure on the establishment of security for the co-financing agreement.
- Module – Implementation of Innovation – under this module it is possible to finance the implementation of R&D results in the company's business operations, in the form of innovative solutions, consistent with the areas of national smart specialisations, as well as other costs directly related to the innovation implementation. R&D work may be co-financed under the "R&D" module, financed from other funds or purchased by the Applicant;
- Module – R&D Infrastructure – under this module the Applicant may obtain funding for investments in infrastructure necessary to implement the research agenda for the creation of innovative products or services consistent with the areas of national smart specialisations. The infrastructure must be used for industrial or experimental development purposes as defined in the GBER. The research agenda may be co-financed under the "R&D" module or implemented and financed entirely with other funds. As part of the implementation of projects under this module, one can receive co-financing to cover up to 70% of expenditure on fixed assets, materials and construction works, as well as intangible assets (the level of support results from the Regional Aid Map).
- Module – Competence – the support provided in this module provides for the improvement of competencies of employees and managers (related to R&D work), their acquisition of new skills and qualifications, including

qualifications included in the Integrated Qualifications System (ZSK) understood as a formal confirmation competencies held by an authorised entity or qualifications and competencies recommended by the Sectoral Competence Councils, in particular in the field of: R&D, smart specialisations, industry transformation towards the 4.0 economy, technology transfer, innovation management, commercialisation of R& D results R, competences in the field of internationalisation, protection of industrial property, digitisation, climate policy, eco-design, circular economy, low-carbon economy, as well as competences necessary to operate research infrastructure financed under a comprehensive project. As part of the implementation of projects under this module, one can receive co-financing to cover up to 70% of training expenses.

- Module – Greening of Enterprises – the aim of the support is the transformation of enterprises towards sustainable development and the circular economy, including the development of new business models. The implementation of the module is intended to change the way enterprises think about the entirety of their business operations, taking into account its environmental aspects and switching it to a circular model: from the selection of contractors and resources, through product and service design, to sustainable production and management of waste and product life cycle. The module includes support for eco-design, environmental and product life cycle assessments (Product Environmental Footprint (PEF), Life-Cycle Assessment (LCA), Environmental Technology Verification (ETV) and implementation of the related recommendations and investment support under greening enterprises.
- Module – Digitisation – the support is intended to finance investments to the extent of application of solutions aimed at digitisation in the enterprise: production, processes, products, services and business model. The support will also be used in order to increase the level of cybersecurity in enterprises. The level of co-financing in the companies of this module is: 70% of expenditure on fixed assets, materials and construction works as well as intangible assets (the level of support results from the Regional Aid Map), 50% of expenditure on consulting services, including those supporting innovation, and 80% of expenditure on with environmental protection.
- Module – Internationalisation – the purpose of the support offered under the module is the promotion of the company's products or services abroad. Support in this area may inter alia include: commercialisation of R&D results abroad, participation in international supply chains, promotion of products or services on foreign markets, obtaining protection of industrial property rights outside Poland or defending them. The support is addressed primarily to SMEs that conduct R&D&I activities. The support will also cover small mid-caps, mid-caps and other large companies. Enterprises other than SMEs

and small mid-caps may successfully obtain financial support for production investments under the condition that they cooperate with SMEs. The level of co-financing under this module is a maximum of 50% of expenses on participation in trade fairs and conferences and economic missions, a maximum of 50% of expenses covering consulting services, including those supporting innovation, and a maximum of 50% of expenses on protection/defence of industrial property rights.[42]

Priority II – Innovation-friendly environment;

Specific objective: RSO1.1. Developing and strengthening research and innovation capacity and the use of advanced technologies (ERDF).

The funds planned to finance projects under the above specific objective will address such problem areas as: increasing the ability of the science sector to cooperate, technology transfer, support for initiatives selected at the European Union level, alternative methods of financing R&D, pilot and monitoring projects, activation, networking, development of enterprises by supporting clusters, development of enterprises by supporting innovation centres and development of enterprises starting innovative activities.

Implementation of projects conducive to increasing the ability of the science sector to cooperate is aimed at supporting the mobilisation of people and institutions in the science sector to cooperate with business, as well as to international cooperation in order to increase the number of commercialised research results, improve the competence of research teams in the field of technology transfer, increase the mobility of R&B staff. The above will be implemented through the following modules:

- International Research Agendas – support for the creation and development of world-leading organisations and research teams, cooperation with a foreign partner and application of the best global practices. The support will be a systemic instrument of stabilisation. The initial allocation of funds is EUR 100 million for the years 2022–2029.
- Team projects – support for R&D work carried out by teams led by scientists from around the world in Poland (or partially abroad), carried out in partnership with a foreign laboratory (run by academic units or companies) and an entrepreneur from Poland.
- Cooperation of the best research teams in the form of consortia in selected strategic areas – support for the implementation of research agendas in areas indicated on the basis of social and economic challenges.
- Supporting the infrastructure of research organisations for the economy: the use of the existing infrastructure will be a priority; the support for projects from the Polish Map of Research Infrastructure and projects that meet i.a. criteria

42 https://www.nowoczesnagospodarka.gov.pl/media/111296/FENG_zatwiertowani_przed_KE.pdf (accessed: 09.03.2023).

indicated in the Partnership Agreement; implementation of the research agenda in line with the KIS, taking into account in particular the areas of cooperation with enterprises. As part of the investment, it is possible to launch the so-called "learning factories": educating staff/testing new solutions by entrepreneurs. Development of the competencies of the scientific and research staff, e.g. in the field of commercialisation of R&D, technology transfer, and innovation management, is an obligatory element of the projects.

Within the framework of the objective to support technology, the following measures have been programmed to be implemented:

- support aimed at preparation for the commercialisation of technological solutions (including those developed at universities and research organisations), e.g. R&D and pre-implementation work; strengthening cooperation with enterprises, also through e.g. cooperation with Sectoral Competence Councils, innovation centres, KIS working groups, long-term development of services of technology transfer centres and special purpose vehicles, and raising awareness on the importance of commercialisation among people managing a research organisation;
- improvement of business competencies of research teams at universities, verification of their compliance with market needs, also through cooperation with Sectoral Competence Councils, innovation centres, KIS working groups;
- measures to develop spin-offs, also through participation of private investors as well as to support commercialisation of solutions developed by individual innovators. Teams and companies benefiting from commercialisation-related funding source can then seek further support through development programmes and equity instruments.

Support for initiatives selected at the European Union level: The support will be awarded to the best projects selected through assessment procedures as part of calls for proposals conducted at the EU level:

- Funding projects awarded the Seal of Excellence under the HE or other EU programmes.
- Support for IPCEI projects
- Funding projects implemented by Polish partners in the areas of KIS as part of S 3 transnational partnerships.

Alternative methods of financing R&D work intended under the objective include:

- Joint research projects – support for R&D projects of enterprises and research organisations, implemented together with partners;
- Grants for Eurogrants for research organisations and entrepreneurs in order to for them to be prepared to successfully apply for funding within the framework of the EU programmes under the direct management mode;
- Innovative public procurement – new ways of financing R&D projects in the problem-driven research formula. Funding will cover R&D and technology

demonstrators, in particular related to the European Green Deal. Apart from that, Grand Challenges open to interested innovators is intended to be arranged for.

Pilot and monitoring projects, activation, networking are implemented under the objective:

- Inno_LAB – designing and testing new forms of support for broadly understood innovation, R&D and pro-innovation competencies. As part of the project, including activation activities, recommendations resulting from the work output of Sectoral Competence Councils, NSS working groups are followed;
- Project on the National Smart Specialisation – includes the process of entrepreneurial discovery as well as monitoring and evaluation of activities in the area of smart specialisations. It is also intended to undertake activities in the field of coordination and cooperation at the national and regional level, aimed at increasing the involvement of Polish entities in the international cooperation in the areas of KIS and RIS;
- Inno_Regio_lab Project: support for regions to build R&D&I capacity through knowledge exchange and networking; analysis on the development of entrepreneurship, innovation and effectiveness of regional development policy, development of assumptions for support tools in regional policy. The project may follow recommendations resulting from the work of Sectoral Competence Councils and NSS working groups.

The development of enterprises through support for clusters includes, above all, actions to support clusters (National Key Clusters and supra-regional growth clusters). It is primarily planned to strengthen human and infrastructural resources, test new services, build platforms and internationalise. The support is tailored to the level of cluster development and covers implementation of new services by clusters for companies, taking into account the recommendations of the Sectoral Competence Councils as well as the effects of the work of KIS working groups.

Development of enterprises through support for innovation centres constitutes the measure undertaken for the benefit of Innovation Centres (OI) based on a new model of the IO accreditation system to the extent of specific functionalities and consortia of technological specialisations with the participation of IO, i.e.:

- support for the development potential of entities accredited at the central level, in connection with the testing and implementation of new/improved services for entrepreneurs in the field of accredited functionality or technological specialisation;
- support for the provision of high-quality pro-innovation services by accredited consortia, including support for digital and green innovation hubs (DIH, GIH).

The development of enterprises launching innovation booster activity constitutes the measure dedicated to enterprises that do not have experience in

the implementation of R&D projects financed with the EU funds. As part of the Innovation Coach information service, development goals of potential beneficiaries of the Programme in the area of innovation will be set out and their innovative potential will be diagnosed. Then, as part of the INNOSTART Project, Innovation Coach graduates will be able to take advantage of:

- specialist consultancy in the field of concept development and preparation of the first R&D project;
- financial support for the implementation of the first R&D project for START.

2.1.1.1. Specific objective: RSO1.2. Reaping the benefits of digitisation for citizens, businesses, research organisations and public institutions (ERDF).

Measures under the specific objective include the need to increase the benefits of digitisation for businesses. An important part of the support available under the objective is to support the digital transformation of SMEs. The models indicated in this part of the programme also take into account the challenges related to the digital transformation of the economy. In this way, they contribute to the implementation of the EU Digital Strategy and other EU and national strategies in this area. In particular, this applies to the European Digital Innovation Hubs (EDIH) ecosystems and the Testing and Experimentation Facilities (TEF AI) dedicated to those issues.

2.1.1.1. Specific objective: RSO1.3. Strengthening sustainable growth and competitiveness of SMEs and creating jobs in SMEs, including through productive investment (ERDF).

Measures carried out under the above objective address i.a. the need to support SMEs to internationalise. At the same time, support for the development of innovative start-up/scale-up companies is an important part of the financial assistance available under the objective. Supporting this type of enterprises requires a variety of measures – from instruments supporting the creation of startups (popularisation and preparation to run your own enterprise, seed financing) through specialised support for the development and scaling of a selected group of startups (development programmes of an acceleration nature) to financial capital allocated to innovative companies. The implementation of models under SO1.3 thus contributes to the implementation of the EC challenge set out in the CSRs for Poland 2019 and 2020 as far as improvement of competitiveness and internationalisation of small and medium-sized enterprises is concerned.[43]

Priority III – Greening of enterprises;

2.1.1.1. Specific objective: RSO2.1. Supporting energy efficiency and reducing greenhouse gas emissions (ERDF).

Under the specific objective, measures are intended to contribute to increasing energy efficiency and reducing greenhouse gas emissions, and thus contributing to

43 https://www.nowoczesnagospodarka.gov.pl/media/111296/FENG_zatwiertowani_przed_KE.pdf (accessed: 09.03.2023).

the achievement of the objectives of the European Green Deal as well as national strategic documents.

2.1.1.1. Specific objective: RSO2.3. Development of smart energy systems and grids and energy storage systems outside the Trans-European Energy Network (TEN-E) (ERDF).

Under the objective, support will be provided for IPCEI projects – financing projects of Polish enterprises participating in the implementation of Important Projects of Common European Interest (the so-called IPCEI projects) in accordance with Art. 107 sec. 3 lit. (b) of the Treaty on the Functioning of the European Union (TFEU), as IPCEI projects are clearly innovative in light of the latest developments in the sector. Financing will cover projects that fit into the specific objective related to the development of smart energy systems and grids as well as energy storage systems, in particular projects related to hydrogen technologies. The thematic and material extent of support will be consistent with the scope of projects included in the EC decision on the IPCEI in the area of hydrogen.[44]

Priority IV – Technical Assistance.

The implementation of Priority 4 is aimed at ensuring an effective management and implementation system of the Programme. Three areas of support have been identified:

- efficient programme implementation system;
- ensuring the potential of beneficiaries, potential beneficiaries and partners;
- effective information and promotion of the Programme.[45]

On January 19, 2023 the calendar for the call for projects under the European Funds for Modern Economy (FENG) programme was approved. The amount of funds allocated is EUR 4.7 billion. In 2023, 27 competitive and 16 non-competitive calls are expected to be launched.[46] Calls for Projects will be carried out within the framework of three measures:

- Action 1.1 The SMART path
- Action 2.1 International Research Agendas
- Action 2.2 First Team
- Measure 2.4 Research Infrastructure of the Modern Economy
- Action 2.7 Proof of Concept
- Action 2.9 Seal of excellence
- Action 2.10 IPCEI
- Measure 2.12 Grants for Eurogrants

44 https://www.nowoczesnagospodarka.gov.pl/media/111296/FENG_zatwiertowani_przed_KE.pdf (accessed: 09.03.2023).

45 Ibidem.

46 https://www.poir.gov.pl/strony/about-the-program/fe-dla-nowoczesnaj-gospodarki/aktualnosci/schedule-naborow-realizatorch-w-ramach-programu-fundusze-european-dla-nowoczesnaj-gospodarki- na-2023-r/ (accessed: 18.03.2023).

- Measure 2.25 Promotion of the brand of innovative SMEs
- Measure 2.32 Technological credit
- Measure 3.1 Ecological credit
- Operation 3.3 Hydrogen IPCEI.[47]

The FENG calls addressed to consortia of SMEs and research organisations or non-governmental organisations are:

- SMART path – i.e. developing and strengthening the research and innovation capabilities of enterprises;
- Joint Research Undertakings – i.e. measures aimed at the operations of entrepreneurs and scientific and research consortia for the purposes of implementation of R&D work to the extent of technological solutions, the need for which will be defined by the partners;
- IPCEI – a model that supports Polish entrepreneurs participating in the implementation of Important Projects of Common European Interest.

The institutions that will organise calls for proposals under respective measures are: the Polish Agency for Enterprise Development (PARP), the National Centre for Research and Development (NCBiR), the Foundation for Polish Science, Bank Gospodarstwa Krajowego (BGK). The first Calls for Projects started in the first quarter of 2023.

47 https://www.poir.gov.pl/media/113708/harmonogram_naboru_świadcz_FENG_11012023.pdf (accessed: 18.03.2023).