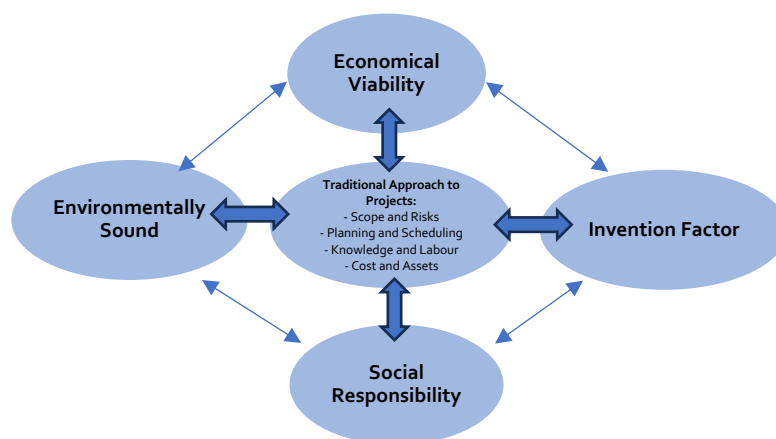


## PROJECT MANAGEMENT IN CIRCULAR BIOECONOMY

There are many definitions of a project. It can be generally accepted that a project is “*a unique set of events with a main goal and defined objectives, as well as agreed plans for achieving that goal*”. When specifically considering circular bioeconomy projects related to research, it has been found that they tend to focus mainly on “*the creation and diffusion of techno-economic knowledge*”, e.g. technological applications and market acceptance; and to a lesser degree on systems knowledge, e.g. handling of risks and undesired effects. Referring to “bioeconomy” projects, such projects “*require radical and disruptive innovations, based on complex knowledge base*” and “*cooperation between organisations from different value chains*”. Examples include projects aimed at innovative techniques of reducing waste heat, projects implementing their own sources of energy (not only in the countryside but also in cities), or projects reducing harmful emissions.

Circular bioeconomy projects can span from theoretical research concepts, such as experimenting with new materials for batteries, to significant infrastructure investments, such as transforming waste management in cities. These projects can be related to any industry or operation that currently uses or has the potential to use biological resources. Innovation is the key factor that is common in most definitions of this type of project.

The objectives of such initiatives are primarily oriented towards environmental improvements with impact on people's quality of life, but also the goal is to achieve tangible economic benefits. Bioeconomy projects base on technological innovations (Industry 4.0) but are also dependent on business aspects and socio-technical systems. Currently, there are many initiatives in biofuels, forestry, food industry, chemicals, biopolymers, biomaterials, bioprocesses, biotech crops, biorefineries, and biodiversity conservation. They are often exploratory and need to address expectations from several different dimensions, including societal and environmental goals, consumer behaviour, economic regards, technical viability, etc. (Figure 1).



According to Watt: “*in addition to considering the cost, scope, and schedule of a project, a project manager should work to ensure the project is socially, responsible, environmentally sound, and economically viable*”. Management of a project relating to the circular bioeconomy, in addition to the standard management tasks, must also take into account sustainability and

innovation aspects, the importance of which is emphasised by scientists involved in bioeconomy and biotechnology.

Project management consists of a few phases: **initiation**, **planning**, **executing**, and **evaluating**.

In the **initiation** phase, ideas are generated, the context of the problem is defined, data and information are obtained from various sources, and a diagnosis of the problem is made. Based on the information and ideas gathered, the best solution (idea) can be selected and its implementation planned. Bioeconomy projects often require the involvement of “users” or stakeholders in the process of design of a service or product (UCD, User Centred Design). It is vital to answer the following questions:

- Why is the project worth implementing and which of the SDGs can be achieved?
- What is the context (incl. local) and who can be potential beneficiaries / stakeholders?
- What are the existing policies and regulations that affect the project?
- How can its value (financial and non-financial) be determined?
- What is the technical and organizational design of the new solutions?
- What are the main problems and opportunities related to the project?
- Does the organization possess the technical and human capabilities and knowledge required to meet these needs?

Different ways of defining the project or finding new solutions can be used in the initiation phase, e.g. the Waterfall model, the Agile approach or the Design Thinking method. When defining the problem, it is useful to use creative thinking methods, for example: the “5 Why” method, the Ishikawa diagram, the problem ladder, ideation, brainstorming, de Bono's 6 hats method, lateral (inverted) thinking, Mind Mapping, Scamper (modifying existing solutions in different ways), prototyping (physically designing a product or solution, in the form of a model), etc.

The initiation phase is accompanied by many uncertainties that arise from the process of seeking information, knowledge and project ideas. Many factors must be taken into account at this stage. Figure 2 highlights crucial factors for initiating bioeconomy projects, including understanding of environment, trade, energy security, GMOs and R&D, agriculture, and waste legislation. Driving forces come from external and internal sources, such as renewal of traditional industries with bioeconomy seen as a way to future-proof the organization.

The next stage is **planning** and shaping the project. At this stage, the visions and goals of circular bioeconomy project should be defined. The products or services that will result from the implementation of a such project must be oriented towards sustainable development goals, but should also be user-oriented (user, e.g. customers, residents, community, etc.).

The project planning phase ends with a detailed plan that describes the scope of the project, the role of a project manager, the tasks of the team members or staff, the communication plan, and the criteria for success. It is also necessary to clarify and specify the details and prepare a time and financial framework on which the project will be based. At this stage, a SIPOC table can be used to define the scope of the project and its expected results. During the project preparation phase, it is also necessary to establish a timetable, a work structure and a list of tasks and to identify the people responsible. The Work Breakdown Structure (WBS) matrix can be used to

concretise the work in the project, as well as a Gantt chart. Also important at this stage is the setting of milestones, i.e. specific points on the project timeline that are relevant for evaluating progress towards project goals.

In order to manage the project staff well, it is important to break down the roles and tasks as well as to establish the scope of each person's duties and responsibilities. In carrying out the team management functions, the project manager (PM) can draw up a roles and responsibilities matrix, or use other available methods, such as the Responsibility Assignment Matrix or the RACI matrix often used in the process approach.).

The **execution** phase is the implementation of actions, i.e. the execution of the tasks that have been planned. This phase includes the processes of managing the team and monitoring progress. The manager is responsible for organising and conducting meetings. Information can be communicated through various channels. The most common are verbal and written channels. The verbal channel allows for a direct relationship with employees, while the written channel enables a permanent record to be kept or is used in situations where the message contains a lot of content or detail. In general, direct methods (meetings, phone calls) and indirect methods (emails, letters), using ICT tools, are employed to convey information. For time management, schedules in graphical or textual form are used, e.g. based on the Gantt chart or IT systems such as Microsoft Project, Asana or Jira. The Crashing method, PERT or simple Kanban board also can be used in time management.

It shouldn't be forgotten that bioeconomy projects are characterised by realistically higher risks, both external and internal, as they are accompanied by entirely new challenges. There may be problems e.g. with material efficiency: quality or availability of raw materials. Bioeconomy projects could also entail risks related to unintended consequences, such as changes in land use and threats to biodiversity that, for example, could be observed with regards to biofuel production. Some factors / risks can result from market conditions, but they may also arise from institutions or market regulators. Various monitoring methods are used to identify risks of an internal or external nature, including observation, interviewing, record keeping, modelling, Delphi method or brainstorming.

The last phase: **evaluation (closure)** is also very important, especially in the context of bioeconomy initiatives. The bioeconomy refers to new regulations and processes in economies, shaping new solutions, a new market for products and services, which requires advanced knowledge and people with specialist expertise. Hence, a project in the area of the bioeconomy should be a coherent concept, the implementation of which corresponds to the overall directions of development and activities of the bio-based solutions economy, with sustained effects. Concerning this aspect of the bioeconomy projects, it is important to evaluate the results obtained with the objectives (sustainable development goals), including, above all, determination of the impact of the project on social development (in its various dimensions), on economic development and on the environment through sustainable economic development.

## **CSR – CORPORATE SOCIAL RESPONSIBILITY**

What does it mean for a corporation to be socially responsible? Academics and practitioners have been striving to establish an agreed-upon definition of this concept for 30 years. In 1960, Keith Davis suggested that social responsibility refers to businesses' *“decisions and actions taken for reasons at least partially beyond the firm's direct economic or technical interest”*. At about the same time, Eells and Walton (1961) argued that CSR refers to the *“problems that arise when corporate enterprise casts its shadow on the social scene, and the ethical principles that ought to govern the relationship between the corporation and society”*. In 1971 the Committee for Economic Development used a “three concentric circles” approach to depicting CSR. The inner circle included basic economic functions - growth, products, jobs. The intermediate circle suggested that the economic functions must be exercised with a sensitive awareness of changing social values and priorities. The outer circle outlined newly emerging and still amorphous responsibilities that business should assume to become more actively involved in improving the social environment. The question of reconciling the firm's economic orientation with its social orientation was taken when a comprehensive definition of CSR was set forth. In this view, a four-part conceptualization of CSR included the idea that the corporation has not only economic and legal obligations, but ethical and discretionary (philanthropic) responsibilities as well (Carroll 1979).

When implementing projects, companies should consider the interests of different stakeholder groups, including social and environmental concerns.

### **Examples of CSR activities:**

- Establishment of corporate foundations
- Social campaigning
- Employment ethics
- Sustainable waste management
- Waste segregation
- Scholarship funding
- Charitable activities
- Trainings for employees
- Social reporting
- Charity fundraising.