

APPENDIX

THE PARIS REGION'S RESEARCH AND INNOVATION: ACHIEVING GLOBAL EXCELLENCE

DEFINITIONS

Research and development (R&D)

Research and development were defined and codified by the OECD in the Frascati Manual (2002). They include the creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

Research and development exclusively include the following activities:

- basic research: work undertaken either for reasons of pure scientific interest – free basic research – or to make a conceptual contribution to technical problem-solving – oriented basic research;
- applied research: work directed primarily towards finding the possible applications of the results of basic research or towards finding new solutions for achieving a specific objective set in advance;
- experimental development: drawing on knowledge gained from research or practical experience, it is directed – using prototypes or pilot plants – to producing new products, installing new processes or improving substantially those that already exist.

Innovation

The latest version of the Oslo Manual defines four categories of innovation:

- product innovation, goods or services: this is the introduction of a new or significantly improved good or service in terms of its features or of the use for which it is intended. This definition includes significant improvements in technical specifications, components and raw materials, integrated software, user friendliness or other functional characteristics.
- process innovation: this is the implementation of a new or significantly improved production or distribution method. This concept involves significant changes in techniques, equipment and/or software;
- organisational innovation: this is the implementation of a new organisational method involving work practices, workplace organisation or a company's external relations.
- marketing innovation: this is the implementation of a new marketing method involving significant changes in design or packaging, placement, promotion or the pricing of a product.

Thus, R&D and innovation are intrinsically linked, but:

- the transformation of research results into market products and services is not automatic;
- and, above all, innovation may be technological, but also social, organisational, usage-based, etc., and does not always arise from R&D.

The indicators that are available mainly measure R&D-related activities:

- inputs: the resources devoted to research, including human resources (research personnel) and financial means (in-house expenditure on R&D/GERD);
- outputs: the results of R&D, i.e. scientific performance levels (publications) and technological performance levels (patent registrations).