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Basic / fundamental / applied research: some clarifications

In the EU Regulation 428/2009, there are de-control notes (meaning derogations from license requirements) for dual-use technology that is the result of basic scientific research. In other texts, you will find references to fundamental research or applied research. Let's try to make a little order among these wordings.

There seems to be a common understanding in the research community of the difference between the terms. The major difference seems to be the purpose of the research, that is, what the research is set to achieve.

WHAT IS YOUR RESEARCH GOOD FOR?

BASIC research

- Desire to **expand knowledge**.
- Curiosity driven.
- Intended to answer **why, what** or **how** questions.
- Increase understanding of fundamental principles.
- Does **not** have immediate **commercial** objectives.
- It may not necessarily result in an invention or a solution to a practical problem.

Answer fundamental questions: how do things work?

Leads to new products, technologies & processes

VS

APPLIED research

- New knowledge acquired has **specific commercial** objectives: products, procedures or services.
- Answer **specific questions** aimed at solving practical problems.

Creates new products, technologies and processes

Leads to new fundamental questions

Source: [University of Texas at El Paso](#)

From an export control point of view, things are a little more nuanced.

Basic scientific research. It is defined by the EU Dual-Use Regulation as “experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective”. It refers to fundamental research.

The [2020 draft EU Guidance](#) provides two criteria to assist in determining whether there is basic research, being understood that the decision thereto has to be taken on a case-by-case basis.

The first criteria is the Technology Readiness Level (TRL). Research output stemming from TRL1 and 2 research are generally considered basic scientific research. The eligibility of research output stemming from TRL3 and 4 are to be assessed on case-by-case basis. Output stemming from research above TL4 is not considered as basic scientific research.

Industry funding involved in the research activities is the second criteria. Collaboration with industry where research is externally funded by an industry partner and likely to result in a commercial development indicates that the research output will not be basic scientific research. The same applies when the industry funder or sponsor is given the opportunity to review and comment on publications or presentations prior to their release and to request the (temporary) exclusive use of research results.

Applied research. This is research that is not fundamental. It aims at finding a solution for an immediate problem and does not limit to explore certain issued and elements.

In the US, the borders between basic (fundamental) and applied research seem to be not as clear. The concept of "fundamental research" was established by National Security Decision Directive 189, dated 21 September 1985), which establishes a national policy with regard to how such research shall be treated for purposes of the various export control regimes. NSDD 189 defines fundamental research as: basic and applied research in science and engineering where the resulting information is to be shared broadly within the scientific community.

NSDD 189 provides that the conduct, products, and results of fundamental research are to proceed largely unfettered by deemed export restrictions. It also states that the government must determine - before releasing a research opportunity - whether the research should be classified or otherwise kept secret. Research that carries access, participation, or dissemination restrictions will not qualify as fundamental research for purposes of the export control regulations. These regulations expressly recognize that fundamental research is excluded from deemed export controls, and no export license or other authorization is needed to involve foreign nationals in fundamental research activity. However, such research may give rise to export issues if the primary research is to be conducted outside of the US or if it requires exposure of foreign nationals to proprietary or confidential export controlled information provided by third parties such as corporations, commercial vendors or government collaborators.

