

Glossary of terms used to characterise innovation

Applied research ¹	Original investigation undertaken in order to acquire new knowledge directed primarily towards a specific practical aim or objective. Can include <i>prototypes</i> and <i>pilot plant</i> .
Basic research ¹	Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view
Commercialisation	The process of taking a product or process from <i>early</i> to <i>commercial deployment</i>
Commercial demonstration	A <i>demonstration</i> , conducted following <i>technology demonstration</i> , aimed at proving that a product or process could proceed to <i>commercial deployment</i>
Commercial deployment	The condition under which a product or process can be profitably deployed by commercial enterprises regardless of whether public subsidies are involved
Demand pull	Demand pull refers to market environments or emerging needs which incentivise innovative products or processes. It can refer either to emerging market opportunities or public sector policies and measures, including subsidies, designed to promote innovation. It is often linked to or used in dichotomy with <i>technology push</i> .
Demonstration	An activity that demonstrates the viability of a product or process
Deployment	The use of a product or process for practical and/or commercial purposes.
Development ¹	Systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed
Diffusion	Widespread uptake of a product or process throughout the market of potential adopters
Early deployment	The early use of a product or process for practical and/or commercial purposes. Corresponds roughly to an <i>innovation</i> .
Experimental development	See <i>development</i>
Feedback R&D	<i>R&D</i> conducted to solve scientific or technical problems that arise when a product or process is being demonstrated or deployed
Full-scale deployment	Commercial deployment where a product or process has established a new market or has gained a material share of an existing market.
Incremental innovation	An improvement in performance, cost, reliability, design etc. to an existing commercial product or process without any fundamental novelty in end-use service provision
Innovation system	The system of actors, institutions, networks and processes that result in innovation taking place. Covers <i>research</i> , <i>development</i> , <i>demonstration</i> and <i>commercial</i> activities leading to <i>deployment</i> . Can be used in reference to countries, sectors or technologies. Formally, covers processes that lead to early deployment but can also be used in an extended sense to include processes leading to <i>commercial</i> or <i>full-scale deployment</i> .
Innovation ²	New products and processes and significant technological improvements in products and processes. An innovation has taken place if it has been introduced on the market (product innovation) or used within a production process (process innovation). Depending on context, products and processes can be new or improved anywhere in the

world, or new or improved in relation to a firm, a market or a country.

Invention ⁴	A new scientific or technical idea, and the means of its embodiment or accomplishment. To be patentable, an invention must be novel, have utility, and be non-obvious.
Market formation	Activities designed to create, enhance, or exploit <i>niche markets</i> and the early <i>commercialisation</i> of technologies in wider markets
Niche markets	Application of a product or process in a limited market setting (or niche) based on a specific relative performance advantage (or on public policy incentives) and typically not exposed to full market competition
Pilot plants	Plant constructed with the principal purposes of obtaining experience and compiling engineering and other data
Prototype ¹	An original model constructed to include all the technical characteristics and performances of a new product or process
Radical innovation	A new product or process that strongly deviates from prevailing norms and so often entails a disruptive change over existing commercial technologies and associated institutions
Research ¹	Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society
Research and development (R&D) ¹	Creative work undertaken on a systematic basis in order 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, development and demonstration (RD&D)	Collective term covering all three activities
Research, development, demonstration and deployment (RDD&D)	Collective term covering all four activities
Technology demonstration ⁴	<i>Prototype</i> , rough example or an otherwise incomplete version of a conceivable product or future system, put together as proof of concept with the primary purpose of showcasing the possible applications
Technology push	Technology push is the process of pushing a technology on to the market through RD&D or production and sales functions. It can refer either to firm activities or to public sector policies and measures designed to promote innovation. It is often linked to or used in dichotomy with <i>demand pull</i> .
Technology readiness level (TRL) ³	A type of measurement system developed by NASA to assess the maturity level of a particular technology. Used mainly to assess the readiness of individual technological components to operate in a larger technology system. Because of the specific context, it cannot readily be mapped on to the Frascati definitions of <i>R&D</i> . TRLs range from 1-9 with: TRL 1 corresponding roughly to <i>basic research</i> ; TRLs 2-4 to <i>applied research</i> ; TRLs 5-6 <i>applied research/development</i> ; TRLs 7-8 to <i>demonstration</i> ; and TRL 9 to <i>full-scale deployment</i> .

Notes: 1) Frascati manual definition; 2) Oslo manual definition; 3) NASA definition; 4) definition in common use