



European Funds
for Smart Economy



Republic
of Poland

Co-funded by the
European Union



TRL implementation readiness classification

TRL stands for Technology Readiness Levels, a nine-stage classification of the readiness for implementation of R&D results. The premise of the classification is to determine how close or far a given product/service is from implementation. Level 1 defines the conceptual phase of a given solution, and Level 9 should be understood as the level of full technological readiness allowing the technology to be applied in real conditions.

Classification^{1,2}

1. **Level 1** - the lowest level of readiness. It provides a starting point for further research and development of the idea. At this level, preliminary assumptions and concept of the future technology are formed.
2. **Level 2** - the stage of formulating a technological concept. This level is the starting point of the innovation creation process. The problem is defined, and the developed assumptions are planned.
3. **Level 3** - is reached when experimental proof is carried out to confirm the accepted thesis. At this stage, analytical and laboratory tests are performed.
4. **Level 4** - is reached when the first attempts are made to develop and test a prototype under laboratory conditions resulting from the combination of the technologies of the earlier stages.
5. **Level 5** - is the level of technological validation of the developed prototype in a near-real environment.
6. **Level 6** - the biggest technological leap from level 5. The developed technology is presented and tested in real conditions. At this stage one can already speak about the probability of creating a final product in reality that will fulfill its tasks.
7. **Level 7** - is the moment of demonstration of the developed prototype in an operational environment. The test allows for corrections and further development of the technology.
8. **Level 8** - is technological readiness, which is the final stage of technology development. At this stage, the proof-of-concept process for the operation of the technology in reality has been completed. Tests have been completed with positive results. At this stage, the final version of technical, training and service documentation is developed.
9. **Level 9** - is the highest level of technological readiness. The developed technology works and the resulting product is ready for production and sale on an industrial scale.

¹ Source: Enterprise Europe Network Poland, <https://www.een.org.pl/attachments/article/59595/Poziomy%20TRL.pdf> (in Polish)

² Source National Center for Research and Development:

https://archiwum.ncbr.gov.pl/fileadmin/POIR/1_4_1_4_2019/dodatkowe/13_poziomy_gotowosci_tehnologicznej.pdf (in Polish)