POF-ALL project

POF-ALL is meant to develop a low-cost solution based on Plastic Optical Fiber (POF) to make the delivery of broadband access to everyone possible. A careful optimization of the enabling technologies (components, devices and protocols) will end up in a real-life field test.

At A Glance: *POF-ALL*

Project Coordinator

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Partners:

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2. *Luceat SpA (Italy)*
3. *DieMount GmbH (Germany)*
4. *Plastic Optical Fiber Application Center (Germany)*
5. *Fraunhofer Institute (Germany)*
6. *Universität Duisburg-Essen (Germany)*
7. *Technische Universiteit Eindhoven (The Netherlands)*
8. *Fastweb SpA (Italy)*
9. *STMicroelectronics (Italy)*

Duration: *01/2006 – 06/2008*

Total Cost: *€2.6 m*

EC Contribution: *€1.6 m*

Main Objectives:

The POF-ALL project ("Paving the Optical Future with Affordable Lightning-fast Links") shall develop a technology to allow delivery of 100+ Mbit/s symmetrically to residential users at costs far lower than existing alternatives, thanks to the use of Plastic Optical Fiber (POF). The solution will be targeted at the edge network which, due to its capillarity, is the most expensive part of the access network; and it will be tailored to large residential buildings, which are most common in European cities.

New telecom operators are struggling to deploy glass fiber in the edge networks, despite major installation challenges. POF-ALL shall prove that POF can radically ease installation difficulties and reduce costs while providing ample bandwidth, making it the ideal alternative for edge networks.

The technical goal is to build systems based on large core POF, operating at 100+ Mbit/s symmetrically over distances of 200+ meters. The use of large core POF greatly eases installation with respect to standard glass optical fiber (GOF), but poses physical transmission impairments (due to the higher attenuation and dispersion of POF with respect to GOF) that the project will deal with by optimizing components, devices, transmission and protocol used.

POF-ALL will also gauge market's potential and assess customers' requirement to ensure that the outcome will be an economically viable and cost-effective solution which matches real user's requirements. An appraisal of the project's economic impact at EU level will be carried out, including an evaluation of the advantages of a low-cost solution for edge access networks and its impact in accelerating the deployment of an infrastructure capable of making EU's broadband-for-all policy as fast and cost effective as possible.

A constant work of information and dissemination will be carried out on the objectives of this project in order to attract interest, to share results within the EU and to increase knowledge and accelerate adoption of POF-ALL's technical achievements.

Technical Approach

In order to reach its objectives, the project is structured over the following WPs:

• WP1 – Advanced transmission techniques for 100 Mbit/s over long distances (300+ m)

• WP2 – Module conception and transmission experiments of high speed data (1 Gbit/s and more) over intermediate distances (100+ m)

• WP3 – Component support

• WP4 – Fiber support

• WP5 – Demonstration and Test-beds

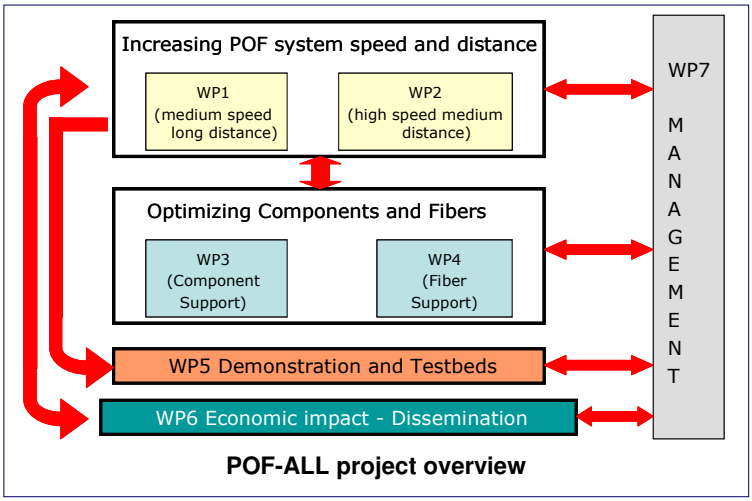
• WP6 – Economic impact, Dissemination

• WP7 – Management

WPs can be grouped into three different areas:

• WP1 and WP2 deal with technical issues, with the goal to considerably extend reach (distance) and bit-rate of POF systems with respect to the state of the art, through the optimization of the transmitter-receiver pairs and the use of innovative modulation and coding schemes.

• WP3 and WP4 investigate improved components and plastic fibers to address WP1 and WP2's needs. While WP1-WP2 operate at the system level, WP3-WP4 focus on new components and fibers' design and realization.



POF-ALL project overview

• Applications of the POF-ALL research results will be demonstrated in WP5 with two test-beds: the Fastweb network test-bed and the POF-House test-bed. WP5 shall also start pre-commercial testing and implementation of the best solutions issued from WP1-WP2, eventually including a validation phase based on the internal validation process of the consortium end-user (Fastweb).

• WP6 deals with Applications, Economic impact, Dissemination and plays a key role with respect to the project. Partners will carry out extensive studies on the market impact of the technologies derived from the POF-ALL project. To this end, the participation to the consortium of a national FTTH provider (Fastweb) is apparently crucial. Moreover, this WP will take care of dissemination activities and Intellectual Property protection.

• WP7 will take care of Management activities.

Key Issues

POF advantages for edge networks are:

• 'do-it-yourself' installation, by simply cutting the fiber and crimping the connector: there's no need for special tools or skilled technicians. This is the key advantage of POF with respect to GOF; it is related to the much larger size of POF's core, which also makes POF connections highly tolerant to residual dust on connectors' endfaces. On the contrary, GOF connectors require careful preparation, cleaning and polishing with dedicated, hard to use and expensive tools.

• minimum space consumption and low weight;

• immunity to external electromagnetic interferences, which allows installation near power lines or data copper cables. Most national safety standards prohibit to lay data copper cables in power lines ducts, allowing the use of optical fiber only.

• zero EMI generation, an issue that is gaining increasing attention in relation to health risks linked with other solutions, such as wireless;

• high environmental resilience, allowing the use of POF cables in adverse environments, such as wet areas and even in water pipelines, sewers and drainage pipes;

• a transparent broadband infrastructure, suited to the integration of various signals such as in "triple play" services;

• the access technology can be easily changed, without changing the building infrastructure (e.g. radio to fiber access); analogue transmission is possible, allowing, when required, compatibility with CATV signals.

Expected Impact

1. Europe would take advantage of a low-cost technology, ideal for telecomm operators to carry true broadband to businesses and households;

2. Europe would be independent from extra-EU technologies for access networks implementation, as it is today with ADSL technologies;

3. European companies will have the chance to export the knowledge of the POF-ALL consortium, promoting further investments and improving the competitiveness and technological role of Europe.