How to use structural funds for investment in high speed networks between public research and education institutions

Research and educational institutions nowadays require **high speed connectivity** between themselves and special advanced services. This high speed connectivity is something different from so called »broad band internet access«. The later expression is used for home internet access and offered by many operators in every country. High speed connectivity for research and education institutions is hundred or thousand times more powerful and is normally not found in the market. This is the reason for special infrastructure having been built in Europe: on a pan-European level this is the GEANT network and on a national level there are so called National Research and Education Networks (NREN's). These networks are now based on optical fibres dedicated to the NREN and not shared for other use.

The Slovenian NREN is Arnes. Arnes is a public non-profit institution financed and supervised by the Government. Arnes operates a special closed network for public institutions for research and education in Slovenia. International connectivity is realised through the pan-European network, GEANT (designed, built and managed as a project in Framework Programme 6). National connectivity is realised through the leasing of optical infrastructure between Points of Presence in different Slovenian towns. Arnes has bought suitable equipment for transmission and manages the connectivity. Public tenders have been used for leasing lines and buying equipment. Arnes also provides necessary additional services (servers, security, e-mail etc) for the education and research community. Apart from managing their local networks, institutions themselves also lease connections to Arnes Points of Presence and pay for these local connections.

The bottleneck in the whole network is now the connectivity between the locations of a university and schools in a city and an Arnes Point of Presence in the same city. High speed networks require optical connections which are difficult to get on the market. In most cases either optical cable is not there or the owner (which is normally a telecommunication operator) does not want to lease or sell it.

The idea in research and education sector was to use structural funds for building optical connections inside towns for connectivity between public universities, schools, libraries and research institutions.

Slovenia proposed a so-called **Single Programming Document 2004-2006** which was accepted by the EC. This document sets out the following priorities:

- Promoting the productive sector and competitiveness
- Knowledge, human resource development and employment
- Restructuring of agriculture, forestry and fisheries

In addition it stressed the following horizontal priorities

- Equal opportunities
- Sustainable development
- Information society

In this period the whole territory of Slovenia is eligible area for ERDF support.

One of the measures described in the Programme Complement under first priority is called »Economic infrastructure and related public services« and one of the goals in this measure is to «develop high speed broadband internet connectivity for research and infrastructure«.

We then found the Commission staff working paper called »**Guidelines on criteria and modalities of implementation of structural funds in support of electronic communications**«
http://europa.eu.int/comm/regional_policy/sources/docoffic/working/doc/telecom_en.pdf
The document describes the criteria for ERDF intervention:

1. ERDF support should be linked and determined by the information society development strategy of the region. There should be an analysis of regional need and opportunities, taking into account specific economic and institutional conditions as well as the pre-existing infrastructure.
2. ERDF investments must be targeted towards areas that would otherwise be neglected under free market conditions. The main focus should be on rural and remote areas which are not covered by adequate infrastructure.
3. Selection criteria for investments in electronic communication infrastructure must adhere to the principle of »technology neutrality«.
4. ERDF support should be limited, in principle, to infrastructure and equipment which is open to all operators and service providers.

Thinking how to achieve the goals of connecting public universities, schools and research institutions with optical connections and at the same time following the guidelines of the above mentioned documents **we found the following problems**:

1. ERDF investments should be done in rural and remote areas. On the other hand universities, research institutes and bigger schools are located in towns and not in rural areas. In rural areas there are only smaller schools which do not need high speed connections and special optical cables because existent technologies based on copper offered by operators (as ADSL) are sufficient.

2. ERDF investments should be done where there is no infrastructure yet. The problem is that it is not easy to find out if optical cables exist in a certain region. Telecommunication operators in most cases do not reveal this information because they do not want to lease the infrastructure to others. Also, sometimes there are optical cables but they are already fully occupied.

3. ERDF investments should not be done where the market can provide the solution. It is in principle always possible to go to the market and ask for laying new optical cables. The problem is that the price could be enormous. Could ERDF investments be used in such a case?

4. ERDF funded infrastructure should be open to all operators and service providers. If optical cables are built between public education and research institutions for their traffic it is not possible to give the same cables to all operators and service providers. The idea is that each school or research institution decides about the usage of the optical cable ending at its premises. If the new optical cable belongs to the institution itself then it would be easy for that institution to take services from different service providers because it can come to (or come to the vicinity) of all the providers in that town.

5. Question connected with the previous one: can a public institution become the owner of the infrastructure funded by ERDF ? More specifically: can a public university become the owner of the optical cable built with ERDF funds going from their premises to the centre of town (e.g. to the telehouse in that town).

6. In every optical cable there could be 2 or more optical fibres. Cables with many optical fibres are relatively cheaper than those with fewer fibres. The main cost in laying cable is connected with construction work. The consequence of this is that laying 100 pairs of optical fibre is not much more expensive than laying one pair. Each school need only one or two pairs. If it is not much more expensive to lay more than this many more questions arise:
   - the additional optical fibres not used by a public institution should probably be financed by other (e.g. private) sources
   - how to divide the cost (e.g. by number of fibres used for public sector and for the market)
   - the cost for additional fibres will be in any case low – does this present a disturbance in the market?
   - should additional fibres be available to all the operators under equal conditions? How to achieve this?

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