RESULTS OF THE PUBLIC CONSULTATION ON HOW TO REDUCE THE COST OF ROLL OUT OF HIGH SPEED BROADBAND

Q1. What are the benefits (including approximate savings) that could be achieved for NGA rollout by a more intensive infrastructure sharing within the EU, including the infrastructure of utility companies?

Nearly all the respondents to the public consultation identified significant benefits for NGA rollout from a more intensive infrastructure sharing, including the infrastructure of utility companies, although different estimates of savings were put forward, depending on the existence, availability and conditions of access to passive infrastructure. While most respondents identified bigger cost and time saving potential in urban areas, sharing can nevertheless also be beneficial for extending the reach of NGA to remote and less densely populated areas. Enhanced sharing was identified by utility operators as a factor reducing the investment amortisation time and improving the investment over revenue ratio.

For vertical integrated operators, both incumbents and ANOs, as well as public authorities and some utilities companies, enhanced sharing of infrastructure would lower barriers to entry and foster infrastructure competition. A limited number of replies, in particular from some ICT and dark fibre operators argue, however, that, ultimately, these benefits come to the expense of service competition, because the limited space in the existing ducts would only allow collocation of a small number of operators. The conclusion according to which better use would lead to favourable urban planning, less digging and less nuisance, thus presenting significant social and environmental benefits was nevertheless unanimous.

Q2. What are the benefits that could be achieved by a more coherent regime of infrastructure sharing within the EU, including the infrastructure of utility companies?

Most public authorities would welcome a more coherent regime of infrastructure sharing as it would create a favourable investment environment, improve the competitiveness of the EU and contribute to the single market by facilitating the emergence of transeuropean operators. Providers acknowledge the potential for simplification of administrative procedures and underline that a coherent regime would ensure equal treatment of operators and transparency. Nearly all respondents agreed that coherence would increase visibility and legal certainty of facility sharing, thus promoting this mode of deployment and achieving the benefits underlined in the previous question. A minority of public authorities and associations of local utilities companies pointed to the additional costs related to the use of utilities' infrastructure and highlights the local character of the deployment, arguing for a case by case cost-benefit analysis of using the infrastructure of utilities companies for broadband deployment and against a Europe-wide regulation.

Q3. Which are the main bottlenecks (practical, administrative, technical or legal) that operators wishing to deploy high-speed communication networks are confronted with when accessing existing infrastructures?

Higher operational and maintenance cost of shared ducts, complexity, technical incompatibilities, higher risk for network security and integrity were reported as practical obstacles to accessing existing infrastructures more by the telecom operators and the public authorities, than from the utilities companies' side. Utilities companies concentrated on the local character of deployment and on the *ad hoc* potential for cost

reduction through sharing. Telecom operators seem more concerned about the different topology of utility networks, with different access points, as well as with the discrepancy of business models and of deployment timeframes between telecom and utilities companies. Lack of accurate information was the most recurrent topic when highlighting bottlenecks to sharing infrastructure, irrespective of the background of the respondents.

The cost of access to infrastructures, not only in terms of high prices or abusive conditions, but also of lack of transparent rules for construction, operation and maintenance cost apportioning, was almost unanimously identified as an obstacle discouraging access seekers. The absence of a legal obligation to share, or inversely of a right to access passive infrastructure was reported mainly by the incumbent operators and the public authorities, while NRAs insisted on the lack of clear rules dealing with liabilities. It seems that the refusal to grant access concerns equally private and public owned infrastructure and is linked to the disincentive of the first mover to allow access to a potential competitor. The question of ownership and exclusive rights to use infrastructure was raised in particular by some NRAs. Regulatory obstacles were identified by incumbents who highlighted that low prices of access to SMP infrastructure act as a disincentive for cross-utility sharing. Telecoms in general and some NRAs perceive the different conditions for access to public or private infrastructure as an important bottleneck, mainly for access to in-building wiring. In the case of mobile networks, sharing is impeded, according to the wireless operators, by legal provisions setting low frequency emissions thresholds.

Administrative obstacles were raised by all respondents More specifically, energy utilities companies emphasized on delays due to the lack of adequate procedures for handling infrastructure sharing, while the telecoms insisted on delays in permit granting and on incompatibilities of administrative procedures for telecoms and utilities companies. NRAs insisted on the absence of adequate dispute resolution mechanisms adjusted to the particularities of infrastructure sharing. A considerable number of local authorities admitted the existence of red tape, hindering co-deployment efforts. Lack of knowledge of the cost reduction potential of infrastructure sharing was outlined by public authorities, telecom operators and utilities companies.

Q4. What are the good practices in the EU and in third countries that could be identified and be promoted with respect to achieving a more intensive infrastructure sharing with a view to deploying high-speed communication networks?

A number of good practices have been identified as having the potential to be generalised across the EU (France, Spain, Germany, Portugal, Lithuania, Sweden, Scotland, UK for sharing of electricity poles Finland, Malta, Italy,) and beyond. France, Germany and Portugal were relatively popular examples.

Q5. What would be the main benefits and disadvantages for broadband investment if access to ducts were mandated across infrastructures?

The potential effect of a mandated access to ducts proved to be the question which divided respondents. Most incumbent operators and central authorities, including NRAs put forward more benefits than drawbacks, while the tendency is clearly reversed for alternative, dark fibre, cable operators and local authorities who warned against the eventual disadvantages of a mandated access to ducts. Utility operators (mainly energy) appear to be rather divided. As benefits, the opportunity to allow for a quicker and cheaper deployment of NGA networks, thus reaching grey, remote and less sparsely

populated areas is withheld. The main disadvantage attributed to such a symmetrical regulation was that it could prove to be a disincentive for operators to invest in passive infrastructure. Operators could be inclined to invest less in civil infrastructure, satisfying only immediate needs without building spare capacity, so as to avoid giving access. Alternative and dark fibre operators stressed that such a measure could be disproportionate and cable operators insisted that it could unduly favour the incumbent operators. A symmetrical obligation could accentuate the need for regulation, in order to be effective. From a technical point of view, such an obligation would induce all operators to follow the same topology, which is regarded from the ICT and equipment sector as negative, but does not seem an issue for the telecoms or the utilities companies.

Q6. What measures could be envisaged to increase the business interest on the side of the utility companies to provide access to their infrastructure for broadband investment?

Economic incentives, in the form of a fair and reasonable rate of return on investment are unanimously considered necessary to increase the business interest on the side of the utility companies to provide access to their infrastructure. In this sense, a number of utility companies argue in favour of lifting legal obstacles where they exist, especially the principle "charges cover cost", which acts as a disincentive for utilities companies to exploit their passive infrastructure. The creation of a market for passive infrastructure was advocated by the telecom sector. Alternative telecom operators would favour the generalisation of mandated access to suitable ducts. The development of a wholesale model, with clear definitions of cost items and cost models, defining in particular maximum values was suggested. The vast majority of the other categories of respondents however suggested that rates should not be cost oriented, but defined on fair terms. Reciprocal exchange of services was also largely supported from the telecoms and the utilities sectors and the public authorities. The possibility for the energy sector in particular to deploy faster and cheaper smart grids, in respect of the legal obligations imposed on these providers, seemed to attract the consensus from all sectors, while central public authorities saw a business case for energy operators to enter the telecommunications market and introduce more competition. Tax exemptions, proposed by some incumbent and wireless operators, were less popular.

Besides financial incentives, another recurrent set of measures increasing utilities' business interest in sharing passive infrastructure concerns dealing with technical and administrative obstacles. The establishment of standardised rules and procedures, broad enough to cover safety and health concerns would pave the way for an easier approach between the telecom and utilities sectors according to alternative operators, equipment manufacturers and public authorities, including NRAs. A coordination of permit granting, in the sense of the necessary update of the rights of way and permits in order to allow the sharing of infrastructure, was advocated by alternative operators. The existence of updated and accurate maps was also suggested by a fraction of alternative operators, so as to create a market place for infrastructure sharing.

Q7: How do you assess the importance of systematic infrastructure mapping / of drawing up consistent inventories of infrastructure? Besides the potential economic advantages for electronic communications operators, do you see other advantages that such mapping could entail for citizens, public authorities or other (economic) operators?

Overall, a certain degree of consensus appears to emerge across different categories of stakeholders as to the potential benefits of enhanced transparency concerning the existing passive infrastructures and in particular of systematic mapping. Nearly all respondents to

the public consultation have recognised its positive added value, both in terms of economic advantages for the operators and of wider benefits for the society as a whole.

With regard to the economic aspects, the replies to the public consultation highlighted benefits both at the planning and the execution phases. Regarding the former, most incumbents, alternative operators as well as public authorities, *inter alia*, suggested that systematic knowledge of existing passive infrastructures is essential in order to plan the deployment of the network in view of the possibility to share existing facilities and to negotiate access with the owners of these facilities. In addition to that, the responses also showed significant benefits stemming from enhanced transparency in the execution phase. First of all, most respondents highlighted the positive impact of enhanced transparency in reducing damages to other passive infrastructures. Furthermore, knowledge of the utilities' infrastructures in a given area might facilitate coordination of works (mentioned by both telecoms and utilities companies), as well as maintenance activities (in particular for telecoms).

Besides the economic advantages for the operators, all categories of respondents mentioned additional benefits accruing to the society as a whole thanks to systematic mapping of passive infrastructures. Many national and local authorities suggested that systematic mapping enhances urban planning and soil management, as well as the adoption of broadband plans concerning the reduction of the digital divide. Both operators and public authorities also suggested environmental benefits, in terms of reduction of need for civil works and better coordination, as well as administrative benefits with regard to the management of permit granting procedures. Other utilities companies and public authorities finally mentioned the benefits of systematic knowledge of networks' infrastructures in order to improve disaster management.

Q9. What information should be included in such maps with a view to facilitating cooperation, infrastructure sharing and broadband rollout? Who should be in charge of such mapping exercises and at what level should it be organised?

The modalities of implementation of a mapping exercise bear a great relevance in view of their impacts on the costs, depending on the extent of the scope of passive infrastructures and information covered.

As to the information to be included in the inventory, there is a widespread consensus as to the need to include some geo-referenced information (GIS location, route of the network) as well as the type of utilisation and the size of the facility including also aerial lines. Several respondents also pointed out the need to include a contact point (the owner or the manager of the passive infrastructure), information on access points to the network (manholes, junctions, etc...) as well as quota and depth references. Additional information concerning the availability of space is considered important by several alternative operators and other utilities companies, although it is often acknowledged that it might be costly to maintain this information up-to-date and that availability in the context of mapping does not eliminate the need for in-site inspection. Some alternative operators considered that access to the incumbent's maps should be granted, while some incumbents also suggested including information about the in-house facilities or at least the existence of mutualisation points at the entrance of the building. Finally some respondents mentioned the inclusion of conditions for access (both economic and administrative ones).

Regarding the scope of the facilities to be included, some respondents (in particular utility companies) suggested that only passive infrastructures technically suitable for broadband roll-out should be included, while others (in particular among incumbents and local authorities) stressed the importance of having information on all utilities companies owned or managed by public and private bodies, also in view of reducing damages and facilitating coordination. With regard to this latter aspect, most recognise the added value of including information about the planning of civil works, while others mentioned the risk that too early disclosure of investment plans might have negative impacts on competition.

Concerning the organisational modalities of a mapping system, most respondents across sectors pleaded for common mapping standards and access point at national level. In particular, many respondents pointed out that this should be managed by a body independent from the operators involved, also taking into account the safety concerns when defining conditions to access. At the same time some local authorities as well pointed out the merits of common standards at national or EU level. On the other hand, the added value of the involvement of the local authorities in terms of availability and accuracy of information (in particular by alternative operators, vendors and local authorities) is appreciated, in the form of federated systems accessible via a common interface. Finally some public authorities as well as incumbents suggested that in some cases mapping services might be available on a commercial basis and this might provide a market incentive to gather this information.

The BNetzA's atlas was the most recurring example cited by stakeholders, mentioning its broad scope, the national coverage and its gradual implementation (a first voluntary phase followed by a mandatory application), but also its weaknesses. Klic and Klip initiatives (in the NL and Flanders respectively) as well as the local initiatives in Sweden and Oslo were suggested as best practices, in particular in view of reducing damages in civil works. Other on-going projects were also mentioned (in Italy, Czech Republic, Finland).

Q10. What would be the approximate cost of introducing systematic mapping?

Together with the broad consensus on the potential benefits of systematic mapping, most respondents of all stakeholders' category are equally sensitive to the significant costs of this exercise, for both public authorities and operators contributing to the inventory.

Several estimates are mentioned by respondents, either on a per unit basis (few ϵ /per connection mapped CAPEX + few ϵ cents/per connection OPEX; 1 to 4 ϵ per squared meter mapped), or based on existing experiences (77mln ϵ CAPEX in Flanders, approx 9-10mln ϵ OPEX for the Dutch KLIC system; 4mln ϵ contract tendered by ANACOM in Portugal; 300mln PLN (ϵ 1 230 mln ϵ 1) CAPEX + 30mln PLN (ϵ 123 mln ϵ 2) administrative costs in Poland) or extrapolation (between 500mln ϵ 1 and 2bil ϵ 2 for the EU). In particular, both set-up and maintenance costs might be relevant, depending on the level of detail of the information included, the need to update it, the inclusion of old infrastructures whose information might not be available, at least in digital format, as well as on the need to adapt to a standard format in view of the different mapping systems used by each operator or across sectors and countries.

A few respondents considered that, at least for old passive infrastructures, costs would outweigh the benefits, while confirming its feasibility for new facilities. The vast majority of respondents, on the contrary, stressed the importance to find the right balance

in defining the level of detail of the information, also on the basis of the available existing information, in order to reduce the costs of the exercise, while at the same time ensuring most of the benefits. In particular, it was stressed that the systematic information needed at an early stage, such as in planning and negotiation phases, is significantly different from the more granular and detailed information needed in the execution phase. Moreover, in-site inspections are in any case needed in order to assess the current state of the facilities. In conclusion, while standardised and easily accessible basic information appears to be highly valuable at an early stage, systematic high level of detail might not bring significant added value, while it has a significant impact on the overall costs of the system.

Several respondents, including incumbents, alternative operators, public authorities and other utilities companies, also mentioned the need to take into account security and confidentiality concerns while providing access to this information. Rather than preventing *in toto* any mapping exercise, these contributions point out the need to adopt some safeguards in defining the detail of the information required (in particular for some critical infrastructures such as water and energy networks) and, above all, in restricting access to access seekers with specific interests for the information provided (such as public authorities, operators, building companies, etc...). As far as confidentiality is concerned, information about investment plans and installation of active equipment should not be disclosed, according to some alternative operators.

Q11. In your view, which substantial benefits would exist in offering possibilities to systematically lay new ducts when undertaking (public) works? In your experience, to what extent would additional potential revenue outweigh the extra costs?

Many respondents across different categories of stakeholders have pointed out the significant potential for reduction of civil works costs stemming from a systematic policy envisaging additional spare capacity for future broadband network in performing public works. In particular direct reductions in the range of 10 to 50% for trenching costs are mentioned, as well as social benefits stemming from reduction of works and extension of covered areas, with limited additional costs in the performance of public works. In this latter regard, some local authorities nevertheless pointed out that while benefit could be significant, additional public funding would be necessary, in particular at EU level.

However, most contributions across stakeholders have also highlighted that this costsaving potential might effectively be exploited only on a case by case basis. Most public authorities and telecom operators in particular point out the need to assess the supply and demand conditions as well as the future needs in order to decide where the additional capacity might be effectively used in the foreseeable future and before degradation of the infrastructure; at the same time, from a technical point of view, they stress that an overall network plan is needed (including a coherent design as well as additional facilities such as junctions, manholes, etc.) for a passive infrastructure to be suitable for broadband. Defining clear liability and cost sharing rules, moreover, could be a challenge. Finally the risk of a negative impact on incentives to invest for private operators is also mentioned. In conclusion most respondents across stakeholders warn against the risk of inefficiencies of a mandatory blanket obligation to lay down additional capacity whenever public works are undertaken, while some (in particular among telcos and public authorities) suggested that the outcome could be significantly positive if such a policy was included in more general broadband plans and/or policy assessing local demand and supply conditions (in particular in un-served areas) and defining transparent processes in order to include broadband passive infrastructure in on-going public works.

Q 12 and 15: 12. What good practices are you aware of concerning transparency and coordination of civil engineering works? Should this be mandatory in the case of publicly financed works? 15. What other best practice examples to improve coordination of civil engineering works are you aware of?

The following best practices were reported by the respondents:

Most systems aiming at coordinating civil works are implemented by local authorities, in view of their oversight of the works on-going on their territory. Many initiatives are based on informal regular coordination meetings at local level with the utilities companies concerned (once or twice a year) and in the context of the permit granting process, in order to share working plans in the concerned area and find solutions for coordination. This informal coordination may also be carried out at national level (e.g. Slovenian NRA) or backed by general rules on consultation (for example for road authorities), or on mechanisms preventing recurring road works (like in Brussels) or on general rules mandating NGA-ready passive facilities for greenfield development areas (in Milan). IT-tools are also available at local level, in order to give visibility to the public plan of works (including atlas) or entailing alerting/noticing systems concerning forthcoming civil works, mainly in order to reduce risk of damages. More rarely these are implemented on a larger scale (Klic and Klip in NL and Flanders respectively). In other cases, coordination of works within the telecom sector is ensured by the industry association of telecom operators (Denmark) or by means of framework agreements with the incumbent (Italy), while commercial "work-exchanges" systems have also been reported in some countries. In Spain the Ministry can give opinions on the urban development plans concerning future broadband needs, while transparency and nondiscrimination rules should be respected by local authorities when sharing civil works with other utilities companies. Finally general national rules on coordination of works, including apportionment of costs, are provided in the French CPCE Law L-49.

The respondents also mentioned general obstacles that hinder coordination, in particular cross-utility, like the mismatch of timing in both planning and executing phases. While in the former case it is often considered necessary to have a clear assessment of the potential demand in the area before deciding to join other civil works, with regard to the latter, the different execution techniques for the utilities companies involved may slow down broadband roll-out, in particular where less invasive techniques are available, such as micro-trenching. Other obstacles are also mentioned with regard to the fragmentation of procedures as well as with the risk of additional administrative burden in case of coordination, like the need for modification of building permits, increase of fees, delays in the replies to the call for coordination.

With specific regard to the scope of mandatory coordination mechanisms (the need to consult interested operators, dispute settlement mechanism or the obligation to accept codeployment) most respondents (including public and private stakeholders) consider that they should be applied to public works only (i.e. financed with public money), while some alternative operators also included SMP operators and suggested that it should also involve the terminating segment in the end-user premise. In addition, the need for more transparency for urban and work plans and conditions (including fees) to join the public works was highlighted. Finally the risk to increase administrative complexity and redtape with mandatory coordination mechanisms was mentioned.

Q.13-14: 13. Are you aware of any sources of information concerning planned civil engineering works? To what extent are they comprehensive (for instance covering

different types of infrastructure) and easy-to-access? 14. To what extent would inventories of infrastructure be suitable for high speed communication infrastructure rollout? What kinds of infrastructures would you consider most suitable for being included in such an inventory? Who should be in charge of such an initiative? Should the obligation to announce planned investments apply only to the public sector, or also to private investors? What time horizon would you consider relevant for the availability of information about individual planned projects, so that this could lead to setting up concrete co-deployment projects? What are in your view the main organisational requirements, including costs, necessary for the establishment and maintenance of such an inventory?

With regard to enhanced transparency of planned public works, a distinction could be drawn between long-term investment planning and short-term execution working plans. Concerning the former, most incumbents as well as some public authorities pointed out the need that transparency of detailed plans should be mandatory only for public entities, in order to protect confidentiality but also to avoid anti-competitive coordination. Regarding short term information on executive works, on the contrary, there is a certain degree of consensus about the benefits stemming from the applicability to both private and public works; the issue of costs of the system, like in the case of mapping of existing infrastructures (see question 10), is also raised, but at least from the operators' point of view it has a more limited impact. However, also in this case there are divergences about the timing of the transparency system. Most incumbents and some public authorities and alternative operators identify the need for a long timeframe in order to trigger effective coordination (at least 6-12 months before the execution), although it is also often considered that from a pure technical point of view, coordination, in particular with other telecom operators, could take place in a much shorter timeframe (90 days or even less, up to 15 days before the execution).

As to the systems for ensuring transparency, many respondents mentioned the added value of information held by local authorities that should be primarily in charge of ensuring coordination of civil works, but the need is generally stressed to have some common standard of information transmitted and some degree of central coordination, like the inclusion in a broader mapping system, in order to avoid fragmentation. On the other side, it has been also noted that if included in a general mapping system, this information should be provided in a simplified form or it risks overburdening the functionality and also its effective use.

Q16. How do you estimate the costs and period of time needed for a company to receive all the necessary permits needed to roll-out a high speed electronic communications access network?

The responses confirmed the existence of a patchwork of lengthy, uncoordinated and unclear permit granting procedures, varying between countries and levels of administration and hindering the efforts of operators to roll-out high speed electronic communications access networks. Permit granting for radio-networks appears to be significantly more time-consuming than for fixed networks. While for the latter, the time varies between 2 weeks and 9 months, delays for receiving the necessary permits to roll-out radio-networks can go up to years and the industry notes a trend towards increasing timetables. Delays are attributed to the different administrative requirements, even within Member States, regions and municipalities, which require a huge amount of paperwork but also to the fact that radio-networks rely more on the use of private land, a factor which further delays deployment. Access of private buildings and property from fixed

network providers appears also quite problematic and significantly delays NGA network deployment.

Most of the respondents were not in a position to provide accurate information about the cost of acquiring the necessary permits, as these are seldom harmonised in each Member State and vary depending on a number of heterogeneous parameters like the number of the competent authorities, the owner of the infrastructure, the extent of the project etc. The main costs include those of acquiring the permits (fees, but also paperwork) and the annual fees for land use. Calculation modes also differ significantly amongst Member States, different models currently being in force, from one-off fees based on the extent of the works to annual fees depending on the number of subscribers served.

A number of respondents provided actual data about the costs. It appears that permit granting for radio-networks is substantially more expensive than for fixed networks: While for fixed networks, the costs are in the order of few hundreds of euro, for mobile networks they can reach thousands. In some Member States, no fees for rights of way are collected, whereas in other, fees are quite expensive. It would be impossible to extrapolate from the responses to the public consultation an average of the cost of permit granting in the EU. Some respondents indicate that this could lie between 10% and 1/3 of the total cost of the infrastructure.

Q17. What measures could help increase transparency and streamline the process of granting such permits? What kind of permits should be covered by such measures?

Harmonisation of permit granting procedures was unanimously considered by the electronic communications sector as necessary in order to tackle their proliferation and lack of coordination. Standardisation, flexibility and streamlining, through a reduction of the number of the procedures, should cover permission requests, forms, deadlines, but also digging instructions. Uniform and transparent rules across each Member State were acclaimed by public authorities, local and central. The importance of eliminating divergence in the interpretation of rules was also acclaimed. Different suggestions for streamlining include establishing a code of conduct between NRAs and electronic communications providers on one side and local or other authorities on the other, or promoting regular coordination meetings. The introduction and generalisation of electronic means for the submission of requests, the exchange of necessary documents, the tracking process for managing applications, the issuing and publication of permits, through an appropriate interface is seen as a measure capable of reinforcing transparency and equality in permit granting. This interface would best be, according to central authorities, the same for all local authorities and providers should find there all necessary requirements for permits.

The need to harmonise fees within each Member State was particularly highlighted by the incumbent and dark fibre operators, as well as by trade associations of the electronic communications sector. Alternative operators and central authorities, including NRAs, insisted more on the need to ensure that fees are not arbitrary, but reasonably justified or even covering only the administrative cost of permit granting without being a source of income for local authorities. Synchronisation of the different timetables of competent authorities was particularly acclaimed by electronic communications providers, especially in view of the potential for co-deployment with utilities companies. The establishment of tacit approval, whenever the administrative deadlines expire without a decision being adopted is popular amongst operators not only of the electronic communications, but also of the utilities companies. The idea of benchmarking at EU

level, with performance indicators measuring time and cost for permit granting at each local authority was backed by a few incumbent operators and NRAs.

Electronic communications providers, incumbents and alternative operators insisted on the need to introduce safeguards against unreasonable conditions attached to permits, in the sense of unreasonable technical requirements concerning depth or profile of the ditches and asphalting roads, unreasonable easement payments, fees for inspection and general prohibitions of civil works, or to define a white list of acceptable terms and conditions.

Telecoms and public authorities (ministries and NRAs) advocated the need to streamline the laws and regulations regarding civil works, including town planning, environment, and public health. Useful measures could also include exemption of categories of small works or infrastructures. Lastly, both dark fibre and wireless operators would appreciate if the legal framework allowed for a single authorisation for the deployment of a complete network in a region or municipality, irrespective of the different owners of infrastructures and the different authorities competent for permit granting. The need to introduce these measures in the National Broadband Plans was highlighted by certain incumbent operators.

Q18. What kind of coordination would, in your view, facilitate the most the permits granting process? How should such coordination be best organised? How far should such coordination go and what would be the benefits achieved of the suggested level of coordination?

As regards the kind of coordination which would facilitate the most the permits granting process, the public consultation reveals a clear tendency from all categories of respondents in favour of the establishment of a one-stop-shop. Only a small minority of respondents, mainly incumbents, rejected the idea of a one-stop-shop, in view of the difficulty to set it up. Most respondents do not consider that the establishment of such a one-stop-shop is incompatible with the respect of the different levels of authority for permit granting. However, two questions divide the respondents: which should be the powers of the one-stop-shop and which body should be vested with these competencies.

While some respondents, mainly a minority of the incumbent operators, manifested their preference for the establishment of a "full" one-stop-shop, concentrating competency for all permits required for the deployment of NGA networks, most of the respondents argued that a single point of contact, a single interface between the providers and the competent authorities, concentrating all permit requests, without however having the decision making power would be more efficient. The one-stop-shop could act as a single information point, ensuring transparency and predictability. It should be able to inform providers willing to deploy NGA networks, not only on the different permit granting requirements, but also on the available infrastructures and possibilities for codeployment. In addition, it could act as a single interface for the submission of requests and should act as an intermediary, routing the applications to the competent local or central authorities. It could also actively manage the process, by using performance indicators and by intervening between the providers and the decision making authorities in case of delays and be able to escalate cases when deadlines are not respected. Lastly, it could publish all requests and permissions granted, so as to ensure transparency and equal treatment of the providers and ensure that all legal deadlines are respected by the competent authorities. Such a process could be linked to an appropriate complaints and dispute resolution process.

As regards the authority best suited to act as one-stop-shop, the trend from the answers, especially of the providers investing in NGA, shows preference for a central authority, like the telecom or energy NRA. Nevertheless, even if this body should preferably be at the central level, incumbent operators, utilities companies and local authorities underlined that, in order to be effective, coordination should be achieved at local level.

Q19. How do you estimate the costs incurred by any measure suggested?

No respondent has provided an estimation of the costs incurred by the suggested measures. The majority of the respondents consider however that the potential benefits would compensate the costs, which are expected to be low.

Q20. What existing requirements under construction laws are you aware of regarding inbuilding equipment for electronic communication infrastructure? Please specify the Member State, region or municipality.

Several requirements under construction laws were reported including standardisation of in-house wiring (AT, DE, Scotland, FI, Switzerland), exemption from building permit (CZ), obligation (FR) or recommendation (LUX) to equip new buildings with fibre, shared access to in-house wiring (DE, FR, PT, ES, Switzerland), obligation to lay down ducts in new urban areas (UK, IT).

Q21. What is, in your view, the most suitable and cost effective way to ensure the existence of adequate and state-of-the-art in-building equipment, while also securing open access for electronic communications providers?

Many respondents pointed to the need to distinguish the situation in buildings under construction and already existing ones. Clearly, the upgrading of installations in existing buildings, which amount for most of the buildings, generates the most onerous problems. Both incumbents and alternative operators referred to administrative procedures related to retrieving permissions for works from the owners, significant civil works' costs, regulatory barriers related to visual impact of the installations in buildings facades and absence of technical standards. To tackle this issue, several solutions were proposed varying from information campaigns addressed to buildings owners and trainings for construction companies, to the use of public funds and tax exemptions.

As regards buildings under construction, most respondents (telecom operators, authorities, associations, equipment manufacturers) favoured a legislative measure imposing obligations on construction developers. The expectations as to the scope of such measure differ among the respondents but these differences are not clearly related to the type of organisation they represent. Some pointed to the need of building standards and certification methods by independent bodies, including a 'neutral' communication box per each household, a utility room in the base of the building (eventually equipped with power supply independent from the building) or an empty electronic communications duct connecting the building to the street. Other respondents cautioned from over specifying the measure as this could inhibit innovation and breach the technological neutrality principle and favoured guiding principles like, for example, to equip buildings with a star-shaped empty pipe infrastructure, starting from the connection of the building.

All the respondents were clear as to the addressee of such obligation(s). The construction companies should ensure NGN ready telecoms installations on the same way as they are bound to provide energy, water and other utilities companies. On the contrary, imposing

on telecoms operators to install in-house cabling at their own costs could lead to higher retail prices for the provided services and to unequal treatment of those building owners who have already invested in NGN ready in-building network.

The new rules concerning the state of the art in building equipment could be provided in construction codes or could also be specified when releasing building permits. If a binding legislative measure could not be proposed, professional organisations could develop 'good practices', such as foreseeing in the construction phase an empty electronic communications duct connecting the building towards the street. To ease the introduction of new rules a progressive removal of copper could be foreseen. After that date only fibre in new or refurbished houses would be allowed.

The main opposition to the concept of mandating NGN ready in building equipment came from cable industry and dark fibre operators, who identified a threat to technological neutrality and property rights. In their opinion, such obligation would endanger their business cases which currently depend on the long time return on investments in in-building installations.

As regards access to in-building infrastructure, the telecom operators favoured symmetric obligations in this regard, with, for example a requirement to adhere to the rules on sharing and maintenance costs of vertical network, whereas cable operators supported by some local authorities opted for non mandatory open access based on voluntarily negotiated arrangements between the parties concerned.

Q22. What would be the advantages and disadvantages of an obligation to equip buildings with open next generation access? How do you assess the additional costs incurred?

Virtually all operators agreed that an obligation to equip buildings with open next generation access would considerably reduce roll-out costs of network operators, with the result that the future generation services (e-health etc.) would be better accessible for individuals. The relevant regulation would boost the penetration rate and competition between the providers as well as stimulate technical innovation. On the other hand, some central authorities noticed that investment in in-house infrastructure, without equal improvement in the access networks, could be lost. They argued that wireless solutions could render in-house wiring obsolete. In addition, imposing NGN ready in-house wiring could be questionable in view of the consumers' choice not to get back to a 'wired solution'. Strong concerns were also expressed regarding the viability of the regulated NGN ready in-building infrastructure from the perspective of the technological development.

According to data from one of the NRAs, the cost of installing telecom infrastructure is capped at 2.5% (2% on average) of a new building's total construction cost. Comparing to the costs of other engineering systems (water, energy), they seem marginal. On the other hand, the cost of upgrading in-house cabling can amount up to two thirds of the total NGA roll-out cost.

Q23. Are you aware of any good practices or measures other than those discussed above undertaken in order to facilitate the deployment of high speed broadband access networks? What has been their impact so far? How would you estimate the cost-saving potential of such measures?

Several best practices were reported, with the Finish, French and Dutch example being the most popular. When it comes to different techniques, microtrenching, façade installation and setting up excavation standards were put forward.