Chapter 25

National Broadband Scheme

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25.1 Key EU competitiveness objectives include ensuring that all Europeans have access to basic broadband by 2013 and to ensure that, by 2020, all Europeans will have access to internet speeds of above 30 megabits per second (Mbps) and that 50% or more of European households will subscribe to internet connections above 100 Mbps.

25.2 Ireland's general broadband objectives for the future were set out in a statement entitled 'Next Generation Broadband – Gateway to a Knowledge Ireland' which was published in 2009. Targets set included the provision of universal access to broadband across the State and higher broadband connection speeds.

25.3 The technology by which broadband service is provided, generally, falls into two broad types

- fixed broadband – delivered through the traditional phone network, by cable or through fibre optic networks
- wireless broadband – delivered over radio networks, commonly via mobile phone masts, or by satellite.

25.4 The National Broadband Scheme (NBS) was conceived as a key element in the delivery of wireless broadband to 10% to 15% of the population of the State that would otherwise not be able to access a service without intervention or support – typically, those living in peripheral areas and regions of low population density where private service providers were unable or unwilling to deploy broadband infrastructure on a commercial basis (the NBS areas)[219]. The Department's economic analysis of the proposed scheme projected net benefits to society and the economy if the scheme proceeded within certain cost limits.

25.5 Following a competitive tendering process, the Department of Communications, Energy and Natural Resources (the Department) entered into a contract with the service provider '3' to provide a wireless broadband service in specified areas. The company was to provide broadband services on a retail basis to all residences and businesses located within the NBS coverage areas seeking a service as well as wholesale access to any authorised broadband operator who wished to serve premises in the NBS area.

25.6 '3' is obliged to provide the contracted services for the term of the contract (until August 2014). The Department has stated that it cannot dictate what the company does after the contract has expired. On the basis that the company has constructed a physical network of masts to serve the NBS area, the Department assumes that services will continue to be provided to customers in those areas after the contract lapses.

25.7 The contract involves the Department paying a subsidy of €79.8 million to '3' in a number of phases over 68 months – 20% paid on meeting mobilisation criteria in December 2008, 67.5% paid on meeting specified rollout milestones, 2.5% payable in month 26 of the contract and 10% to be paid at the end of the operational period less any credits due. The payment schedule, actual and forecast, is set out in Figure 119.

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[219] A further scheme, called the Rural Broadband Scheme, was introduced in 2011. It is designed to provide broadband to individual rural premises in non-NBS areas where a service is not currently available due to technical or other reasons.

Figure 119 NBS Payment Schedule

Payment stage	Payment due date	Budgeted €000	Actual €000
Mobilisation	2008	15,960	15,960
Rollout	2009/2010	55,860	55,864
Final	2014	7,980	—
Total		**79,800**	**71,824**

Source: Department of Communications, Energy and Natural Resources

25.8 The NBS is eligible for EU co-funding under the European Regional Development Fund (ERDF) 2007-2013. Just over €36 million is expected to be recouped by the end of the project.

25.9 A Project Board established by the Department, with the assistance of independent technical consultants, monitors on a monthly basis the performance of the NBS infrastructure, service availability, service delivery and customer experience as well as overall compliance by ‘3’ with contractual obligations.

Chapter Focus

The chapter reviews progress to date in delivering the broadband commitments for the Scheme. It examines principally

- whether the planned broadband service is being provided to the agreed standard
- the extent to which the service is being taken up by customers in the target NBS area
- how service quality is monitored and the results to date.

Service Availability

25.10 The area to be provided with a broadband service through the NBS comprises 1,028 selected Electoral Divisions.[220]

25.11 Under the contract with ‘3’, it was intended that most NBS customers in the target areas would avail of a mobile transmission network service. This type of service is accessed using a so-called ‘dongle’ (a device that plugs into a computer). In areas of restricted reception, customers are also provided with a repeater — a device to strengthen the broadband signal within the customer’s premises. A satellite transmission service was also planned that would be available to a small proportion of subscribers who are unable to receive the coverage offered by the mobile network.

25.12 Key requirements specified in the contract with ‘3’ include targets in relation to the download speed achievable by users of the service and the capacity of the system to serve users simultaneously. Limits were also set on the proportion of the service that could be provided via satellite.

[220] Electoral divisions (formerly called district electoral divisions) are the smallest administrative areas for which population statistics are published. In rural areas, each division consists of an aggregation of entire townlands. There are 3,440 divisions in the State. The term ‘areas’ used throughout this report denotes the divisions targeted by the NBS.

Download Speed

25.13 The average speed of connection to the internet, as measured by the average download speed, is a key measure of the performance of a broadband service.

25.14 The OECD compares internet speed in its member states using the maximum download speeds advertised by internet service providers. On that measure, the internet speeds achievable in Ireland, at 9.6 Mbps, are substantially lower than those in most other member states. The average advertised speed across all members states is estimated at 37.5 Mbps, with an average speed of 85.6 Mbps being advertised in Sweden.

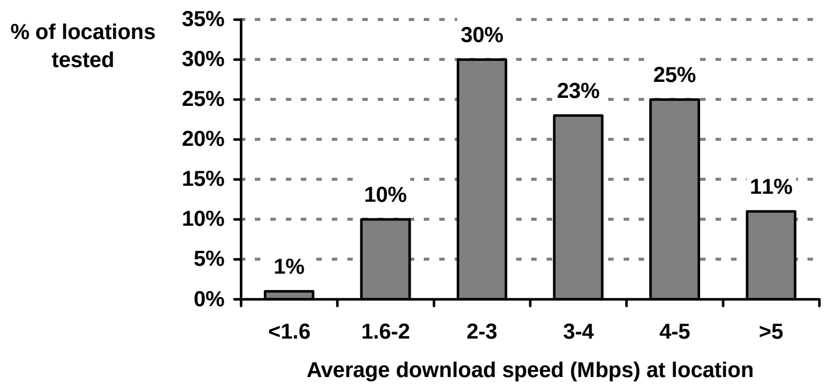
25.15 In practice, these speeds are the theoretical maximum speeds achievable with the technology being used by internet service providers. Users of those services have lower actual download speeds when averaged over a time period. This reflects a variety of factors, including service availability and the number of service users seeking a service at the same time (referred to as the contention ratio).

25.16 The contract with '3' specified that the service to be provided in the NBS areas should initially have a minimum download speed of 1.2 Mbps, with upgrades to minimum download speeds of 1.6 Mbps from July 2010 and 2.3 Mbps from October 2012. It was projected that the average download speeds for those availing of mobile broadband would be 2.9 Mbps by July 2010 rising to 3.4 Mbps by October 2012.

25.17 Under monitoring arrangements in the contract, '3' is obliged to test the broadband services it provides for speed, contention ratio and quality of service. These tests include measurement of the download speed of broadband and contention rate. The company conducts tests of the services provided in randomly selected locations.

25.18 The results of the most recent speed tests reported by '3' indicate download speeds of between 2 and 5 Mbps were available at most of the locations tested (see Figure 120).

Figure 120 NBS Download Speeds in Six Months ending December 2010[a]



Source: Department of Communications, Energy and Natural Resources, '3' test results.

Note: a The results are based on static tests at 90 random locations each month.

25.19 Almost all locations tested were found to have download speeds over the required minimum (1.6 Mbps) at December 2010. Average download speeds of less than 2 Mbps were found at 11% of locations. Overall, average download speed for the six months July to December 2010 was estimated at 3.5 Mbps.

25.20 11% of the locations tested had average download speeds greater than 5 Mbps service. Nationally, it is estimated that 29% of users had an average download speed above 5 Mbps.[221]

Contention Ratio

25.21 The contention ratio for a broadband service relates to the number of customers using the service at the same time. The lower the ratio, the better the quality of service in terms of download speed. The initial maximum contention ratio specified in the NBS contract was 36:1. The service provider was required to reduce the ratio to 22:1 from 1 July 2010.

25.22 In contention tests carried out by '3' the ratios found were below the contractual standard of 22:1 and were generally in the region of 5.4:1.

25.23 In parallel with broadband speed objectives, the delivery of the NBS envisaged a defined limit on data volume downloaded by consumers. Download volumes were set initially at 15 Gigabits (Gb) per month for the mobile service and 10 Gb for satellite. It was expected that subsequent upgrades would increase the available download limit first to 20 Gb and then to 30 Gb in October 2012 for mobile broadband. Currently, the contracted limit is 20 Gb download. However, the maximum available for download from the satellite-delivered broadband will remain the same as is now available – 10 Gb.

Nature of Service Provided

25.24 The Department has stated that the NBS was designed primarily to deliver a broadband service to specified fixed locations in the NBS area. As such, it has effectively been configured as a fixed broadband solution, using wireless broadband technology.

25.25 The NBS set a maximum allowable limit of 5% of the total number of fixed residences and businesses that could receive a service via a satellite connection, considering this product to deliver a lower quality service than mobile broadband. A survey of 300 NBS customers found that 96% were receiving broadband through the mobile infrastructure with the remainder receiving their broadband product through satellite.[222]

25.26 In providing mobile broadband services, operators use mobile repeaters in customer premises to boost the signal. Use of repeaters indicates that the broadband signal experienced by the subscriber in its basic form is less than adequate, due to the nature or orientation of the building or because of terrain obstructions, and needs boosting to provide an acceptable service.

25.27 At 30 June 2011, a total of 43% of the customers of the NBS service used repeaters. The very high percentage of repeater equipment being used in the NBS suggested a poor basic signal being experienced by many subscribers.

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[221] Akamai Technologies Inc, Quarter 1 2011 Report.

[222] There was provision in the contract for '3' to designate certain areas as 'conditionally enabled' and to provide more than 5% of the service in those areas via satellite. In the event, '3' have not used that designation option.

25.28 The Department has stated that the proposed deployment of repeater equipment was given detailed consideration in the course of the evaluation of '3's bid and its use to ensure that the minimum specified NBS services were delivered at fixed locations was deemed to be acceptable. It stated that repeaters are also used to mitigate against the effects of localised 'clutter' (due to terrain) and of building materials in the customers' homes (certain double glazing, wall thickness, windows in an inappropriate direction, etc) all of which are unknown at the time of network planning. It also stated that the deployment of repeaters has reduced the required reliance on a satellite service. When '3' bid in the NBS competition, its solution specified the use of a combination of mobile transmission base stations with use of repeater equipment if the signal strength at a specific customer location was low.

25.29 The costs associated with the deployment of repeaters falls on '3' and, on the basis of the Department's estimate, this equipment has cost the company over €3 million to date.

Conclusion — Service Delivery

Based on service measurement carried out on behalf of the service provider and reported to the Department, broadband services that comply with the service standards set in the contract have been made available in the target NBS areas.

Nationally, it is estimated that 29% of users had an average download speed above 5 Mbps. The overall average speed being experienced in the NBS area was 3.5 Mbps with 11% of the locations tested having average download speeds greater than 5 Mbps.

Views of the Accounting Officer

25.30 The Accounting Officer of the Department stated that the objective of the NBS was to deliver affordable, scaleable broadband services to certain designated electoral divisions in rural Ireland where broadband coverage was deemed to be insufficient. The wider policy objectives of the NBS were

- to address the market's failure to provide broadband in the more remote parts of rural Ireland
- to address economic and social exclusion concerns due to a lack of broadband access
- to enhance the competitiveness of the regions for foreign and indigenous investment.

25.31 The Accounting Officer said that the NBS had delivered on its core objective, in that, since October 2010 affordable and scaleable broadband services were available throughout the entire NBS area in line with the contract signed between the State and '3'.

Uptake of the Service

25.32 Ultimately, social and economic value is achievable from a broadband service only if it is used. Customer uptake is one measure of use of the service. This is usually measured in terms of the broadband penetration rate, either relative to the number of premises where a fixed service is available, or to the population as a whole.

25.33 The Department estimated that there were approximately 200,000 premises capable of being serviced with broadband located within the proposed NBS coverage area. This included dwellings in use and business premises.

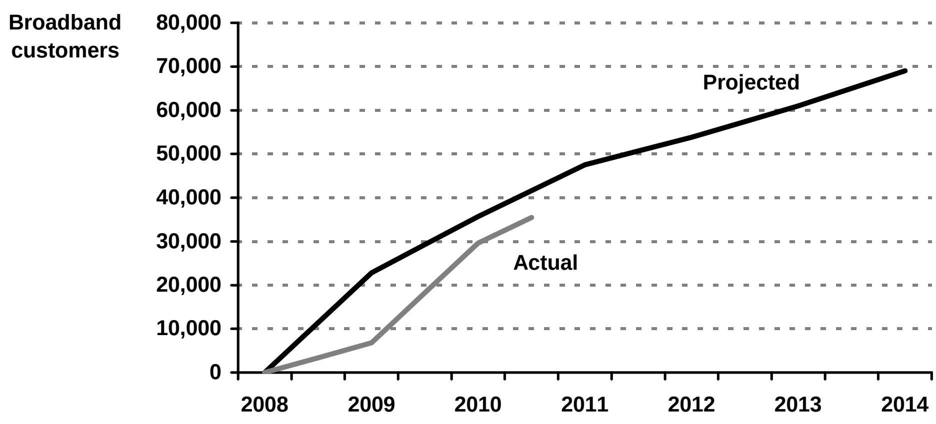
25.34 The Department has stated that the broadband penetration rate in countries with mature broadband environments is around 80% of premises. In its cost benefit analysis of the NBS proposal, it projected an uptake of the NBS service by 126,000 customers by the end of the contract period in 2014, representing an uptake rate of 63% of potential serviceable premises in the region. However, it did not set customer take-up targets for the scheme, or incorporate targets into the contract with '3'. It has stated that uptake by paying customers was envisaged as a matter for the service provider.

25.35 In the context of negotiation for the contract, it was envisaged that 107,000 of projected NBS customers would be retail customers of the service provider and that 29,000 customers would avail of services provided by '3' on a wholesale basis to other service providers.

25.36 In practice, subscriber demand has been significantly weaker than that projected at the outset of the scheme. The projected customer uptake by 2014 was initially reduced to 107,000 retail customers, in recognition of a lack of interest by other broadband service providers in entering into wholesale arrangements with '3'. Subsequently, the projected customer uptake by 2014 was reduced from 107,000 to 68,000 customers i.e. 34% of premises in the NBS target areas.

25.37 As indicated in Figure 121, actual uptake has not reached the levels envisaged, even for the reduced projection level. By June 2011, a total of 35,500 customers had taken up the service offered by '3' – about 15% below the level implied by the revised 2014 projection.

Figure 121 National Broadband Scheme Customers, Target and Actual



Source: Analysis by Office of the Comptroller and Auditor General, based on data from DCENR

25.38 In retrospect, the original projected uptake rates appear to have been pitched too high. It could have been expected that there would be a reasonable level of initial sales to satisfy demand from those that had no broadband service at all and that, once that demand had been satisfied, growth could be expected to level out.

25.39 In a survey of NBS customers undertaken in mid-2011, 51% reported that they had switched to the service from other service providers. The Department has stated that in order to reach unserved homes and businesses, it had to bring a service to some areas that were already partially served. Where it was identified that there was already a partial service, further detailed analysis was undertaken to determine whether or not to include it in the NBS area. In many cases, the Department decided that because there were so many premises in an area without access to a service, the area would be included in the scheme. This meant that homes and businesses in the area that were already capable of receiving a service from another service provider would also be included in the NBS.

25.40 While the lower than projected take-up has commercial implications for ‘3’ in the form of lower than projected revenues, it will (subject to continued delivery of the contracted service to the required standards) receive the full contract payment from the Department.

25.41 If the revised take-up target of 68,000 customers is achieved by 2014, the State subsidy will be an estimated €1,180 per subscriber. This compares to an implied subsidy of €635 per subscriber when the Department carried out its cost benefit analysis of the scheme.

Demand Management

25.42 Under the NBS contract, ‘3’ is obliged to carry out an effective marketing campaign to promote the NBS. It was planned that some €10.7 million would be spent over the life of the contract for that purpose. As Figure 122 shows, the marketing spend to end 2010 has exceeded the planned level.

Figure 122 Marketing Spend – NBS 2009 -2014

	Planned €m	Actual €m
2009	2.4	1.9
2010	2.3	5.0
2011-2014	6.0	—
Total	**10.7**	**6.9**

Source: Department of Communications, Energy and Natural Resources

25.43 Market analysis suggests that, because of uncertainty about employment and reduced disposable incomes, there is a consumer shift towards choosing prepay mobile products, with no contractual obligations. The NBS product is currently only available on a billed basis. A change in the choice of contract available to customers could improve the attractiveness of the product and increase subscriber take-up.

Conclusion — Service Uptake

The appraisal of the proposed NBS was based on a projected uptake of service of 63% of the potentially serviceable premises in the regions covered by the scheme. However, this projection appears to have been overly-optimistic, given that subscriber forecasts were revised down to 68,000 (34%) relatively soon after the scheme began. Furthermore, even though expenditure on marketing of the service is ahead of projections, take-up is lagging behind the levels that need to be achieved if the current projected uptake level by 2014 is to be met. Envisaged wholesale arrangements with other service providers have not been achieved.

While the failure to reach forecast subscriber numbers has commercial impacts on the service provider, there is also a value for money implication for the State’s investment in the scheme, with average contribution per subscriber increasing from a forecast €635 to an estimated €1,180, assuming the current projected level of 68,000 subscribers is realised.

There is also a risk that the wider socio-economic benefits that had been built into the cost benefit analysis will not be fully achieved as a result of the lower then expected take-up.

Views of the Accounting Officer

25.44 The Accounting Officer noted that, by virtue of the NBS, broadband services are now available in all NBS areas for those who wished to avail of them. While the take-up to date is lower than expected, the issue of availability of services in those areas needed to be addressed, given the importance of broadband for social and economic development and the need to avoid a digital divide.

25.45 He stated that while the initial take-up had been slow and continues below expectations, evidence throughout the EU suggested that this pattern of consumer behaviour was normal and that it takes some time for these service to be availed of, following their introduction into a region or area. He said that the risk associated with customer numbers rested entirely with the service provider, and that the taxpayer carries no financial risk on the lower than expected take-up.

25.46 As regards the wholesale market, the Department has stated that the absence of specific market analysis makes it difficult to explain precisely why a wholesale market did not develop. It said that it could be linked to the current economic recession or could reflect the thinly-dispersed population base of the NBS area, making the proposition for large scale wholesale service unattractive. The Department noted that, since the NBS commenced, other service providers have improved the broadband service they offer in the NBS area, thereby improving the overall choice and level of service, and are consequently contributing to the ultimate socio-economic objectives of the scheme.

25.47 The Department acknowledges that the impact of the take-up on socio-economic benefits does arise. While the impact of the dynamics of the competition and the award of the NBS contract to ‘3’ on the other market players has not been explored, a comprehensive assessment of the benefits would need to take account of the number of customers receiving broadband from any provider in the NBS areas, not solely from ‘3’.

Views of the Commission for Communication Regulation

25.48 The Commission expressed the view that it is highly likely that, were it not for the implementation of the NBS, some of the consequential broadband provision would either not have materialised at all or would have materialised at a later date than was originally intended by the service providers.

25.49 The Commission noted that while a change in the type of contract available to customers in the NBS area might improve the attractiveness of the ‘3’ product and increase subscriber take-up, the impact of any new contract options on the existing subscriber base should be considered e.g. the extent to which a prepay option would result in attracting existing billed subscribers, and how such changes might impact upon the overall NBS revenue base of ‘3’.

Quality of Service

25.50 Broadband services based on mobile technology typically underperform when compared to services provided through fixed lines in terms of stability of the connection, latency and speed. Furthermore, service provision in an NBS area does not mean that the broadband signal is of sufficient strength or speed to constitute a viable broadband product from a customer’s perspective.

25.51 Under the NBS contract, ‘3’ is obliged to commission bi-annual customer satisfaction surveys and report the results of these to the Department. To date, three surveys have been completed by an independent opinion survey company, which polled 300 NBS customers each time.[223]

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[223] The results discussed in the following paragraphs have been averaged over the three surveys.

25.52 The surveys disclose that many customers avail of the NBS service because there are no other providers in the area and do not appear to be motivated to subscribe for any apparent positive attributes of the product itself. On the other hand, about half of respondents in the latest survey indicated that they had transferred from other providers, suggesting that some aspects of the service offered are attractive.

25.53 The key result in relation to the quality of the service provided in the NBS area is that 64% of those surveyed reported that the service either met or surpassed their expectations.

25.54 Just over one-third of customers reported that the service fell short of their expectations. Based on analysis of the reasons given for stating that their expectations had not been met, an average of 18% of respondents indicated dissatisfaction with download speed, while 22% indicated the service coverage was not good enough. Problems with inadequate coverage and slow connection speeds also appear to be the main reasons that customers contact the customer care service provided by ‘3’.

25.55 The Department’s view is that customers’ expectations is a subjective measure. For instance, someone may have expectations of a level of service which could only be provided by a 10 Mbps service – that person would be able to say that their expectations had not been met. For that reason, while it is wise to survey and understand if the service was meeting expectations, it was of the view that further information would be required before conclusions could be drawn. Other such evidence includes the following.

- The number of payment rebates to customers has decreased significantly, from 23% of customers receiving rebates in 2009 to less than 2% in 2010.
- The percentage of interruptions of service to date is just over 5% (the target limit set in the contract.).

25.56 Underlying reasons for speed and coverage dissatisfaction can also be related to network performance issues and capacity planning. As an internet service provider, ‘3’ must have a process for monitoring its network performance so that it can trigger appropriate action for repair, preventative maintenance and capacity upgrades. However, the Department is of the opinion that there is no problem with capacity planning. It stated that the network had been designed with a high amount of excess capacity which was monitored and kept below a threshold. Once a threshold is reached, ‘3’ is obliged to upgrade the network and increase the available capacity.

25.57 The Department has also stated that it has quality control measures in place. These include monitoring of the performance of the NBS infrastructure, service availability, service delivery and customer experience as well as overall compliance of ‘3’ with its contractual obligations. It states that upgrades of the network and its capacity are automatically triggered at contractually agreed levels of traffic to ensure that the quality of the broadband service is maintained.

25.58 The Department stated that the NBS contract guarantees service levels and imposes a service credit regime on ‘3’ with significant financial consequences in the event that minimum specification service levels are not met.

Conclusion – Service Quality

The NBS product is the only viable option for many areas of Ireland. This poses some challenges in measuring user satisfaction, as mobile and satellite is not a like-for-like experience with a fixed line service because coverage, availability, application performance and speeds are not comparable.

Some subscribers state they are dissatisfied with the download speed and with some elements of customer care. These elements of service are contracted to be provided by ‘3’ at guaranteed levels. Negative consumer sentiment could damage the prospects of reaching even the reduced take-up forecasts for the scheme.

Views of the Accounting Officer

25.59 The Accounting Officer stated that while customer surveys are a useful barometer of how the NBS service is performing, this metric was only one way of determining whether critical objectives such as service quality were being met. He stated that the findings of the various customer surveys should be aligned with other available performance data to provide a more objective picture of the service being delivered on a day-to-day basis. Other factors that needed to be taken into account included the fact that the number of customer complaints made to the Department has remained very low in overall terms and the number of rebates to customers has fallen noticeably from when the scheme was first launched.

Conclusion

The State has made a subsidy of €80 million available to '3' in order to provide mobile broadband services in specified areas of limited or no coverage.

A demand projection of 126,000 premises subscribing to the NBS service was initially set. The achievement to date has lagged the forecasts with the overall forecast having being reset at 68,000 premises. 35,500 subscribers had been attracted by mid-2011.

Because the likely uptake of the service is lower than projected, the value for money delivered by the scheme will be lower than envisaged in the cost benefit analysis. Based on the revised forecast for uptake, the State's average contribution per subscriber will increase from €635 to €1,180. There is also a risk that the projected socio-economic benefits of the investment will not be fully achieved. It would be useful to conduct a retrospective cost benefit analysis to establish whether and to what extent the actual outturn has matched that projected.

'3' is obliged to monitor the quality of the service provided and customer satisfaction is monitored periodically by means of survey. From the results available to date, almost two thirds of NBS customers report that their expectations for the service have been met. However, around one-fifth of customers expressed dissatisfaction with the download speed and service coverage.

The Department should, in conjunction with its technical advisors and those of '3', consider what additional steps are feasible in order to address customer concerns and ensure that business and other customers have a resilient and high quality broadband service.