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Evaluation of the 6 applications for the GSM2 licence in Ireland

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Confidential

This report is prepared for the Department of Transport, Energy and Communications by Andersen Management International

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Executive summary

This report, which sets out to nominate the best application for a GSM2 licence here in Ireland on the basis of a comparative evaluation of 6 applications received, has been prepared by Andersen Management International. The Project Team on GSM (PT GSM), which comprises members from each of the 3 telecom divisions of the Department of Transport, Energy and Communications, from the Department of Finance, and from Andersen Management International by affiliated consultants, has been heavily involved in the evaluation. PT GSM members participated in the 10 different sub-groups, which were established in order to evaluate the applications in strict compliance with the criteria approved by the Irish Government, in particular the evaluation criteria outlined in paragraph 19 of the RFP document.

All the marks to the 6 applications have been awarded on the basis of the concerted effort of many participants and by way of unanimity. In order to maximize the transparency, the objectivity and the non-discrimination, the evaluation has been based on procedures and rules adopted prior to the closing date.

On the basis of the applications received, supplementary written communication with the applicants and the clarifications provided at the presentation meetings, the evaluation concluded that the three best applications are:

1. A5
2. A3
3. A1

with the indicated ranking, A1, pursuing a differentiator type of strategy, is assessed to be qualified to undertake the GSM2 operations, and A3 and A5 are assessed to be highly qualified.

A3, pursuing cost leadership as part of the strategy, is particularly strong on experience and tariffs. A5, opting for market leadership, is also strong in these areas and is furthermore the strongest application of all regarding the approach to market development, coverage, quality and viability of the technical approach, and performance guarantees of the project. A5 thus presents an application which is comparatively stronger than the application from A3. It is emphasised that the credibility of the business plan and approach to market development and the technical approach ranked higher than tariffs in the selection.

On the basis of the selection criteria adopted by the Irish Government and an objective, transparent and non-discriminatory qualitative comparison of the six applications received, the PT GSM unanimously recommends that the Minister enter into licence negotiations with applicant A5. The manner in which this recommendation is derived from the selection criteria at paragraph 19 of the tender document is summarised in Table 16 and Table 17 in chapter 6. In the event of failure of these negotiations, the PT GSM recommends that negotiations on the award of the licence be opened with applicant A3 and subsequently, if necessary, with applicant A1.

1. Introduction

This report contains the results of the comparative evaluation of the applications for a GSM2 licence in Ireland. The evaluation has been carried out jointly by the Department of Transport, Energy and Communications, the Department of Finance and Andersen Management International.

The evaluation is based on a number of pre-adopted procedures and techniques, which were drawn up and documented in writing prior to the closing date 4 August 1995, see appendices 2 and 3.

Basically, the evaluation has been performed in accordance with the 'best application method', which is often dubbed "beauty contest". This method is strongly recommended by the EU Commission, and the Commission has been duly informed about the approach and techniques of this method applied in Ireland.

Furthermore, the evaluation has been based on the tender documents, in particular the RFP document, which sets out the following statements concerning the evaluation criteria in paragraph 19:

> *"The Minister intends to compare the applications on an equitable basis, subject to being satisfied as to the financial and technical capability of the applicant, in accordance with the information required herein and specifically with regard to the list of evaluation criteria set out below in descending order of priority.*
>
> - *Credibility of business plan and applicant's approach to market development;*
> - *Quality and viability of technical approach proposed and its compliance with the requirements set out herein;*
> - *The approach to tariffing proposed by the applicant which must be competitive;*
> - *The amount, in excess of the minimum initial licence fee, which the applicant is prepared to pay for the right to the licence[1];*
> - *Timetable for achieving minimum coverage requirements and the extent to which they may be exceeded;*
> - *The extent of the applicant's international roaming plan;*
> - *The performance guarantee proposed by the applicant;*
> - *Efficiency of proposed use of frequency spectrum resources."*

These criteria have been structured as marketing aspects, technical aspects, management aspects, financial aspects and other aspects. This sequence is logical, because the foundation of a business case often is a market idea, a vision or a

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[1] Following the launch of the competition, for the reasons described in chapter 2, the licence fee requirement became subject to a minimum of IR£ 5m and a maximum of IR£ 15m.

strategy, i.e. an independent variable. The technical and management aspects are then viewed as "mediators" of the marketing aspects. Finally, the financial aspects, dependent on all the other aspects, could be viewed as the outcome of the business seen from the investor's point of view.

Each aspect has been subdivided into so-called dimensions, and each dimension has been subdivided into indicators and sub-indicators in order to measure and compare the relative merits of the applications in a consistent manner.

With marketing aspects as an example, the evaluators have dealt with the following 4 dimensions, which are all mentioned in paragraph 19 of the RFP document: Market development, tariffs, coverage and international roaming. Under the dimension market development, the evaluators have defined 10 indicators, see Table 2, for example penetration, distribution, segmentation, commissions, customer care and churn, market research, etc.

The evaluation comprises both quantitative and qualitative aspects, and it was decided prior to the closing date that the qualitative evaluation should be the nucleus of the evaluation. As outlined in chapter 2 and appendix 2, a heuristic methodology (i.e. by using qualitative assessments, interpretations, etc.) has been applied with an award of marks (grades) to each application based on a scale from A to E, A being the best.

In order to minimise uncertainty as far as possible, a number of supplementary analyses have been conducted and they appear as appendices 1-13 to this report. Some of the analyses have been deemed necessary in order to make the information provided by the applicants more comparable. Other analyses have been conducted in order to sufficiently document certain decisive marks awarded to certain applications.

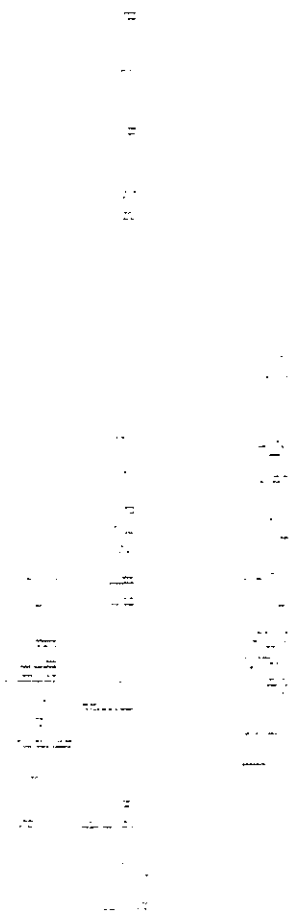
Initially, this report provides a description of the evaluation process (chapter 2). The key characteristics of each application including a description of each applicant and of the basic philosophy underpinning each application is contained in chapter 3.

Having in a general way introduced the applications, the next chapter (chapter 4) as the main body of this report presents the detailed results of the comparative evaluation. This part of the report is structured around the four main aspects of the evaluation - the marketing, the technical, the management and the financial aspects. Each aspect will then be broken down into one or more dimensions, and each dimension will be described by several indicators. Thus, the presentation of the results of the evaluation follows the structure laid down prior to the closing date of the tender.

A separate chapter (chapter 5) has been devoted to cater for sensitivities and risks in each application. In this way, conclusions regarding the overall credibility of the application have been qualitatively assessed.

Chapter 6 will provide a summarising overview of the results of the evaluation and in this part of the report, the three best applications are identified and ranked. In chapter 7, the only recommendation in this report appears, namely to enter into licence negotiations with the consortium behind the application that came out with the best results from the comparative evaluations based on the method recommended by the European Commission and on paragraph 19 of the RFP document.

Supplementary information and the summary of the results from some of the supplementary analyses conducted are to be found in the appendices.



2. Outline of the conduct of the competition process

2.1 The organisation

The Department of Transport, Energy and Communications has had the overall responsibility for the conduct of the competition. The drafting of this report as well as the provision of advice during the tender has been the responsibility of Andersen Management International.

The Project Team on GSM (PT GSM) has been the nucleus of the competition process. The PT GSM comprises members from the 3 telecom divisions of the Department of Transport, Energy and Communications, the Department of Finance, and affiliated consultants from Andersen Management International.

2.2 Selected milestones of the competition process

The competition process was announced on 2 March, 1995 with a closing date of 23 June. 12 interested parties purchased the tender documents.

A facility was provided in the competition process such that interested parties could pose questions in writing. 9 interested parties took advantage of this facility and posed 230 groups of questions of which several contained more than one question.

On the basis of these questions, the Department and Telecom Éireann (concerning technical matters of interconnection) promulgated 2 memoranda on 28 April, allowing all interested parties to work on the basis of the same, mainly regulatory, information. This was further strengthened by a subsequent memorandum, comprising a number of tender specifications, including a number of mandatory tables, as well as a draft licence.

One of the interested parties claimed that the interconnection regime was not adequate in order to sustain and maintain a GSM2 business case in Ireland. The Department, in conjunction with Andersen Management International, then decided to circulate supplementary information on the subject of interconnection stating that the indications in the RFP document on this issue is a matter for commercial negotiation within 6 months of commercial operations subject to arbitration by the Regulator.

2.3 The framing of the evaluation

In order to frame the evaluation work, the PT GSM completed a number of activities prior to the closing date, including, but not limited to, the following:

- A division of responsibilities was agreed, according to which Andersen Management International was to be initiator of the work during the evaluation.

- An evaluation model was adopted as to how a combined quantitative and qualitative evaluation should be performed, see appendix 2.

- Detailed work programmes were adopted in order to ensure timely deliveries.

Shortly before the original closing date of 23 June, the European Commission expressed serious reservations concerning the inclusion in the selection criteria of an auction element in relation to the licence fee for the second operator without the imposition of any fee on Eircell.

It subsequently became clear through bilateral contact with the Commission that infringement procedures would, as in the Italian case, be initiated against Ireland, if the eventual licence fee discriminated against the second GSM operator relative to Eircell. The Office of the Attorney General advised against proceeding with the competition in its then form and risking further legal action by the Commission. The process was accordingly suspended. A revised licence fee requirement was negotiated with the Commission whereby the second GSM operator would volunteer a licence fee in the range of IR£ 5 million to IR£ 15 million and Eircell would pay a fee of IR£ 10 million. This approach was endorsed by Commissioner van Miert on 14 July.

In this way, Ireland became the first EU member state to receive a prior consent from the Commission on the agreed fee structure. The Department then resumed the competition process with August 4, 1995 as the new closing date.

On the closing date, the Department received 6 applications plus a preliminary GSM business case description from Eircell, which is already in commercial operation with a GSM (1) system. The Department and Eircell agreed that this description was insufficient to meet the needs of the Department, and subsequently Eircell submitted on 11 August, 1995, a more detailed business case description following the mandatory tables. Since this "application" is not mandatory, it has not been subject to a comparative evaluation. However, the GSM business case information provided by Eircell has been used as a valuable reference point and served comparative purposes, when judged relevant.

All the GSM2 applications received were admitted to the evaluation, as none of the applications have such substantial deviations from the minimum requirements of the RFP document that they were to be rejected, see appendix 2. With a view to making comparative evaluations, it appeared at an early stage in the evaluation that some of the applications had prepared insufficient information.

In accordance with the provision made in paragraph 16 of the RFP document, it was thus decided to pose a number of tailor-made written questions to the applications, and these questions were forwarded to the applicants on 24 August. The answers received on 4 September revealed that this part of the process had resulted in valuable improvements of the basis for comparisons. For example, a number of questions on metering and billing principles demonstrated that the different applications have used widely different assumptions concerning the charge units (time-true per second billing or billing in increments of, say, 10 seconds) and concerning initial call charge (ranging from no charge to 30 seconds independently of the actual duration of the call).

A large part of the quantifiable side of the applications was then compiled and put into graphics in order to serve as a background for the evaluation.

2.4 The marking and the nomination of the best application

An invitation was issued on 5 September to each of the six applicants to attend a presentation meeting with the PT GSM. The invitation incorporated an agenda for the presentation and a number of questions to be responded to. This was done on an equal basis to all such that one hour was reserved to a presentation of the business case behind the application, one hour was offered to answer questions, which were equally posed and worded to all applicants, and one hour was reserved for the PT GSM to pose questions to the applications. The presentation meetings were consecutively held as 6 separate meetings from 11 - 14 September.

After the presentation, the remaining part of the evaluation was conducted, in particular on credibility, risks and sensitivities, and the overall evaluation and final marking of the applications were completed.

The nucleus of the evaluation was then commenced by the establishment of 10 sub-groups each dealing with one of the dimensions outlined in paragraph 19 of the RFP document, namely market development, coverage, tariffs, international roaming plans, radio network architecture, network capacity, frequency efficiency, performance guarantees, financial key figures, and experience. This approach was agreed prior to the closing date and is also part of the evaluation model adopted, see appendix 3, except for the evaluation of the licence fee offered, which did not require sub-group meetings. Each sub-group comprised members from the Department and consultants from Andersen Management International. In addition, the Department of Finance participated in the sub-groups on financial key figures and performance guarantees. The sub-groups were staffed such that they comprised different members and affiliates of the PT GSM with specific expertise in relation to the subjects to be evaluated. The Subgroups developed a series of indicators against which applications should be measured under each dimension. The award of grades (A,B,C,D and E) at the level of the indicator was achieved through a process of discussion and consensus within each sub-group. The sub-total for each dimension was achieved on the basis of a general discussion of the appropriate interpretation of the most important indicators for each dimension in the context of the evaluation criteria and the information contained in the tender documents. A formal weighting of the indicators was used where appropriate. A similar process was used in relation to the overall award of marks which formed the basis of selection of the winning application and ranking of the top three applications.

An initial draft report was discussed by the PT GSM on 9 October. The incorporation of comments on the initial and a subsequent draft by members of the team in relation to the presentation of the results of the evaluation process has culminated in this final report. This report reflects the consensus view of the PT GSM as to how the results of the evaluation should be presented in the final report.

It is the view of Andersen Management International that the competition process including the evaluation has been conducted in a non-discriminatory way and with a high degree of transparency and objectivity, such that the result achieved is in our opinion a fair comparative evaluation of the six applications.

3. Key characteristics of the applications

This chapter aims at providing a short introduction of the applications received. Firstly, the applicants behind each application are introduced based on the information from each application. Secondly, this is followed by a summary of the philosophy behind each application.

3.1 The applicants

All applications are backed by different consortia. Each application suggests to implement the proposed business plan in a legal entity, i.e. a separate operating company, created by the partners behind the consortium.

As outlined in figures 1-6, each operating company is backed by shareholders as consortium members. In addition, all consortia include at least one foreign telecommunications operator as an important partner. Except for A6, which is entirely owned by foreign companies, all other consortia include Irish members. None of the consortia have stated intentions to make major changes in the consortium construction. However, all applications, with the exception of A3, have expressed interest in making a flotation on the Irish stock market.

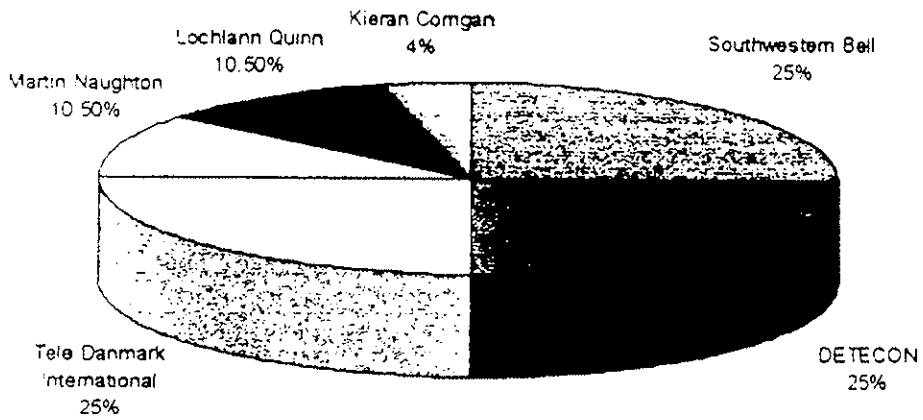


Figure 1. The participants behind A1

A1 will operate as a private company limited by shares under the name of Irish Mobicall. A1 is partly backed by the subsidiaries of three foreign operators (Southwestern Bell, Tele Danmark and Deutsche Telekom through Detecon), partly by three Irishmen with a commercial background, Martin Naughton and Lochlann Quinn both have shares in Glen Dimplex, one of the potential distribution channels. It is not entirely clear from the application, which operator is the leading partner, if any. The consortium does not stipulate a managing partner but a division of responsibilities has been identified in the application.

The application states an intention to make a flotation of 25% of the shares presently owned by the consortium members. The flotation will be initiated after 3 years of operation, depending on the success of the company and the market conditions on

the Irish stock market. The initial share held by Irish investors will be 25%. Although this share might be increased by the projected flotation, the Irish ownership share will remain below 50%.

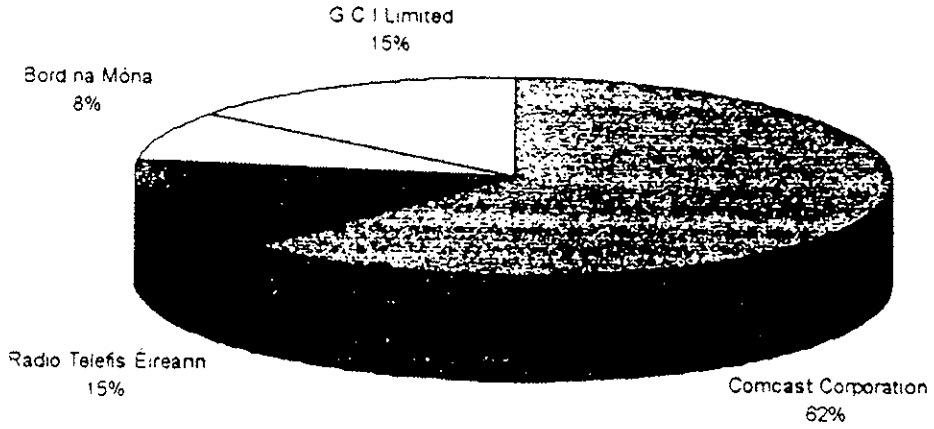


Figure 2. The participants behind A2

A2 has stated an intention to operate as an Irish legal entity under the name of Cellstar, but is not an incorporated company yet. The leading company is a subsidiary of Comcast Corporation US with an ownership share of 60-64%. The consortium is backed up by three Irish companies (RTE, Bord Na Móna and GCI), which all together hold a 36-40% ownership share. The Irish ownership share could increase by means of a flotation. If desired by the Government, the application states a willingness to offer up to 30% as ordinary shares at some time in the future (3-5 years after launch).

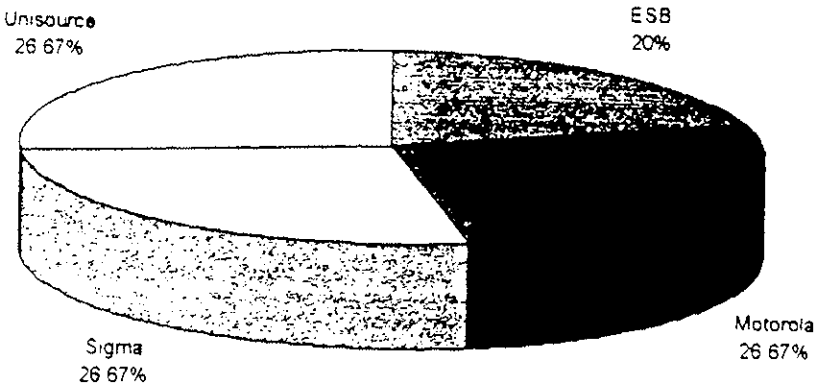


Figure 3. The participants behind A3

A3 will operate under the name of Persona, and Persona is incorporated in Ireland as a limited company. Motorola, Unisource (Mobile) and Sigma Wireless each hold 26.7% of the shares, whereas ESB holds 20%. Principal activities of Sigma Wireless are the exclusive distribution and sale of Motorola radio communications products and systems in Ireland, following a management buy-out of Motorola's Irish distribution activities in 1991. The Irish share defined by the share of companies domiciled in Ireland and owned by Irish people living in Ireland is 46.7%. The application states no intention of flotation, and consequently the business case is not based on a flotation.

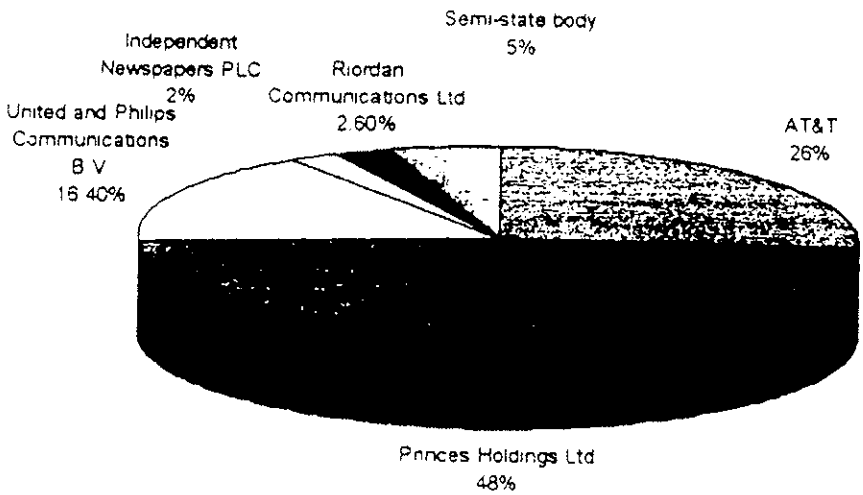


Figure 4. The participants behind A4

A4 will operate as a private limited company, which has been incorporated in Ireland in 1994 under the name of Irish Cellular. The consortium behind A4 is characterised by a comparatively low concentration of ownership among the participants, except for Princes Holdings Ltd., a partnership owned equally by Independent and UII-Ireland Ltd., which is a partnership owned by UIH, RCL, and Tele-Communications, Inc. Princes Holdings presently holds 48% of the shares. Later on, however, Princes Holdings will re-allocate its shares such that United and Philips Communications B.V. will increase its shareholding to 26%, Independent Newspapers Plc will also increase its shareholding to a level of 26%, Riordan Communications will increase its shareholding to 5%, and Tele-Communications, Inc., affiliated with Comcast in the US, is to become a 12% owner. In addition, 5% has been reserved for an Irish semi-state body. Thus, the Irish share will drop to 36%, but might within 3 years of licence award increase again as a flotation of approximately 25% of the shares is planned.

AT&T, holding 26% of the shares, is the leading operator of the company by means of it's mobile subsidiary, better known as McCaw.

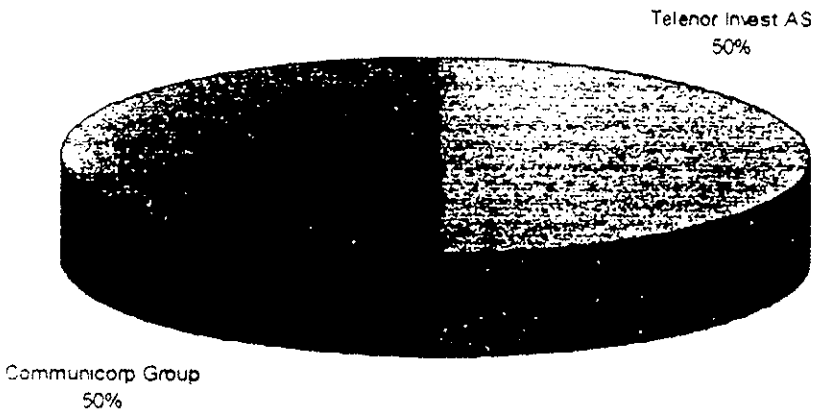


Figure 5. The participants behind A5

A5 will operate as an Irish limited liability company, which has been incorporated in Ireland under the name of Esat Digifone. The participants are two operators, namely Esat who operates in Ireland on the basis of a VAS licence and the Norwegian carrier Telenor. However, Communicorp Group is the shareholding company behind Esat, and 34% of these shares are held by Advent International plc. It is the intention of the applicant to make 20% of the equity available to institutional investors during the period prior to the commercial launch, including a 5% equity stake to Advent International plc. Furthermore, the application states an intention to make 12% available for flotation within three years. It is difficult to state the exact Irish ownership share. Before the flotation, it could as a maximum become 55% and after the flotation it could increase to a maximum of 67%. In practice, the Irish share could turn out to become significantly lower.

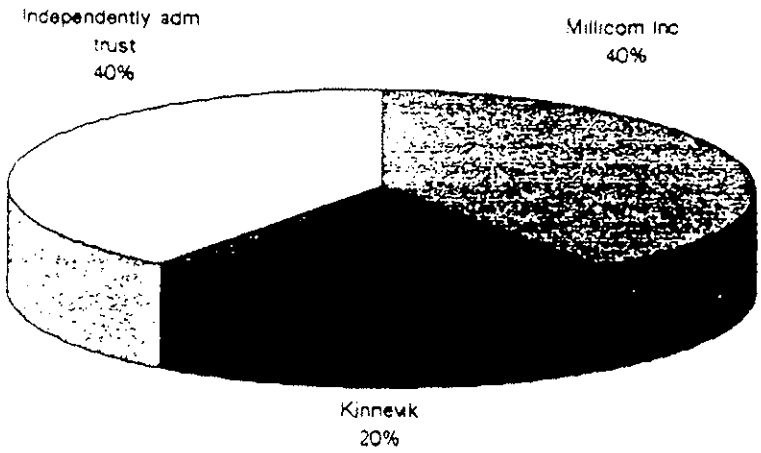


Figure 6. The participants behind A6

A6 has established a consortium, the Eurofone Consortium, to apply for the licence, and a joint venture agreement between the 2 backers has been concluded. The leading operator is Millicom with 40%, but also a subsidiary of Kinnevik, holding of 20% share has operating experience e.g. through the GSM operator Comviq of Sweden. It should be remarked that Kinnevik owns 39% of the shares in Millicom. The remaining 40% of the share are to be administered by an independent trust. Córas Iompair Éireann (CIE), which is not exposed as a fully-fledged consortium member in the A6 application, has a 10% option and 30% or more might be subject to flotations after the award of the licence. The initial shareholding by Irish investors could as a maximum amount to 40%. The application states as an intention, however, to increase this share to 50% within 4 years after the award of the licence.

3.2 The basic philosophy behind each application

Despite the fact that there are a number of similarities between the applications, a comparative assessment of the underlying philosophies and strategies shows considerable differences, based on a number of issues.

The diverseness of the business plans presented in the applications is to an disproportionately large extent influenced by the diversity in market and marketing approach. For this reason, this part of the applicants' approach is heavily reflected in the short description of the various basic philosophies per applicant provided below.

A1, backed up by three well-know mobile operators, intends to launch quickly with a proprietary roll out, leaving the option of national roaming open for further negotiations with Telecom Éireann. The applicant will use its own sales forces and has in addition set up agreements with a number of dealers/outlets, leaving the

service provision path open. A1 does not opt for market leadership, as the applicant foresees itself as taking up less than 50% of the market.

Consequently, A1 views itself as pursuing **a differentiation type of strategy**, which is consistently reflected in the application for example by a focus on the variety of service and packages, and, not least, customer care aspects. This focus is also substantiated by the fact that A1 quotes the highest operating costs per subscriber during the initial years. This implicit wish to compete with Éircell on services and quality as opposed to fierce competition on tariffs, also seems to be consistently reflected by the fact that A1 expects to have a comparatively low degree of private consumer penetration.

A2, with the US operator Comcast as the main backer, also tends to view itself as a **differentiator** in the Irish market, but clearly in a less ambitious way. This is for example reflected in a comparatively weak focus on customer care aspects, some high tariffs, and a weak technical plan. The understanding of relevant Irish and EU legislation appears to be generally low. This is reflected in particular in that the application contains elements which may not be fully in accordance with EU rules in relation to procurement of equipment.

However, the role as differentiator is substantiated by the relatively low ambitions in relation to market share, where A2 foresees itself with only 44% of the GSM-market in year 2009, the lowest of all applicants.

A3, backed up by Motorola and Unisource as the major operating player, pursues a strategy with considerable similarities to **cost leadership**. A3 intends to build a network with a rather low capacity and to run the company in such a way that the operating costs are comparatively low. In general, the tariffs are projected to be low as well.

Subsequently, A3 ultimately aims at the mass market, with an expected private consumer penetration representing above 50% of A3's subscriber base at the end of the 14 year planning period. The penetration is substantiated by an advanced segmentation, based on the identification of specific Irish types of customers. Furthermore, A3 intends to play a major role among the distribution channels with the establishment of a wholly-owned service provider under the brand 'person-to-person'. A3 does not opt for market leadership measured by the long range market penetration ambitions, as A3 only projects to obtain a modest 45% share of the GSM market.

A4, with AT&T as the dominant operator, specifically opts for **market leadership** in the long run and projects to have taken up well above 50% of the GSM market at the far end of the 14 year planning period. This is consistently supported by a comparatively large network with many antenna sites and a high traffic capacity of the proposed network. A4 does not specifically aim at bringing mobile services to the mass market. Furthermore, A4 assumes a level of traffic usage which is not common among European GSM operators and which is considerably higher than the real life experience of Éircell in the Irish market.

The applicant plans a modest entrance in the Irish market, for example with a comparatively slow roll out. Finally, the fact that A4 has already selected and contracted some of the infrastructure vendors may cause difficulties in relation to the EU procurement rules.

A5, with Esat as the Irish fixed provider and Telenor as the mobile operator, intends to provide good and quick coverage. In addition, A5 has a high degree of preparedness. A5 intends to differentiate itself by a number of innovative marketing initiatives, for example by advanced customer service, broad distribution channels, lower tariffs, and branding. In general, A5 opts for **market leadership**.

The ambitions are supported by the technical plans, and the level of experience of the consortium partners is reflected in the initial set up of the organisation, including, but not limited to, the top level management. The financial plans, however, indicate some weaknesses against the background of market leader ambitions, in particular with a degree of solvency below 0% during some of the decisive initial years.

A6, which is backed up by ample mobile expertise based on Millicom and Comviq of Sweden, intends to pursue a **cost leadership** strategy with low end user tariffs. This strategy is also consistently reflected in the market penetration ambitions of A6, as the applicant expects to penetrate the mass market such that 2/3 of A6's customers will belong to this segment during the far end of the planning period.

In the application, the cost leadership strategy is seen to be adopted primarily from Comviq of Sweden. Similarly, A6 does not plan to bring service provision to the Irish market, but to let the cost drivers, including low entry cost, boost the market. Although the cost leader strategy leaves a number of weapons in the hands of the operator, A6 seems to be comparatively unprepared for the Irish market. As an example, no tailor-made Irish market research has been conducted to support the market and marketing plans.

Also the technical, financial and management plans reveal that A6 is relatively unprepared for the Irish market. As an example, the business plan generates a comparatively low IRR, which might even turn negative, by the introduction of sensitivity factors.

Despite many similarities among the applicants taken at their face value, a careful study of the applications reveals that the applicants intend to pursue widely different strategies. Two applicants opt for market leadership (A4 and A5), two applicants opt for cost leadership (A3 and A6) and two applicants opt for a differentiation type of strategy (A1 and A2). Thus, the basic philosophies behind the applications are widely different. Such differences are to be further investigated in the next chapter, which sets out to summarise the results of the evaluation conducted.

4. The comparative evaluation of the applications

This chapter intends to provide a presentation of the results of the comparative evaluation. Each section deals with one of the identified aspects comprising an overview of the various dimensions attached to the aspect together with the assessment (marks awarded) of both the dimensions and the aspect.

In order to proceed systematically and consistently, each dimension has been broken down into so-called indicators, and sub-indicators have been used to further refine the assessment of the dimensions. The applications are described in relation to each dimension after the overview provided in each sector of this chapter. The assessment of the dimensions is based on factual information and the methodology described in appendices 2 and 3.

The results of the comparative evaluation presented in the following section, follows the same logical framework as used to structure the evaluation (aspects, dimensions, indicators and sub-indicators). This somewhat mechanistic approach has been necessary and adequate in order to treat the applications on an equal footing. The report, therefore, reflects the summarising results gained from the discussions in the 10 sub-groups - one for each dimension.

4.1 Marketing aspects

The dimensions of the marketing aspects are identified as market development, coverage, tariffs and international roaming plans. Coverage and international roaming plan both rank as less important as they have been lined up as number 5 and 6 indents of paragraph 19, respectively. All these dimensions are important for the customers, because they will influence the availability, range and quality of the GSM2 service.

Marketing aspects	A1	A2	A3	A4	A5	A6
1. Market development	C	C	B	C	A	C
2. Coverage	B	C	A	C	A	D
3. Tariffs	C	D	B	C	C	A
4. International roaming plan	A	D	C	C	C	C
Marketing aspects (subtotal)	**B**	**C**	**B**	**C**	**A/B**	**C**

Table 1. Marketing aspects: Award of marks

Clearly, A3 and A5 are the strongest applications on marketing aspects. A5 has the most elaborate approach to market development and is also strong within coverage but less strong within the tariff and roaming dimensions. The in-depth supplementary analyses have shown, however, that A5 indeed has a competitive approach to tariffing, and that A5 comes out more favourably from the comparative evaluation, when some of its appealing special offerings and the metering and billing principles are taken into consideration, see appendix 6. Therefore, the marketing aspect of the A5 application supports an ambitious market leader strategy in the Irish market.

Almost as strong as A5 comes A3, with a slightly more favourable approach to tariffing due to the cost leader type of strategy, but with a weaker approach to the market development. Next to A3 comes A1 with the highest overall marks of all within the roaming area. In addition, A1 is less favourable than A3 concerning market development, coverage and tariffs, but seems to consistently pursue the strategy of a differentiator.

All the other applications are assessed less favourably, for various reasons. A4 simply lacks high scores on any of the marketing dimensions. Although having comparatively low tariffs, A6 has less favourable performance on the other dimension, in particular the 'hard' dimension, coverage, which is to become a binding licence dimension. A2 has obtained the lowest marks of all applications.

4.1.1 Market development

Market demand forecasts are indeed essential in any mobile business case. Two obvious indicators of demand allow for some quantification. The first most commonly used is the projected number of SIM cards, i.e. subscribers, although such projections could turn out to be either too optimistic or pessimistic in real life.

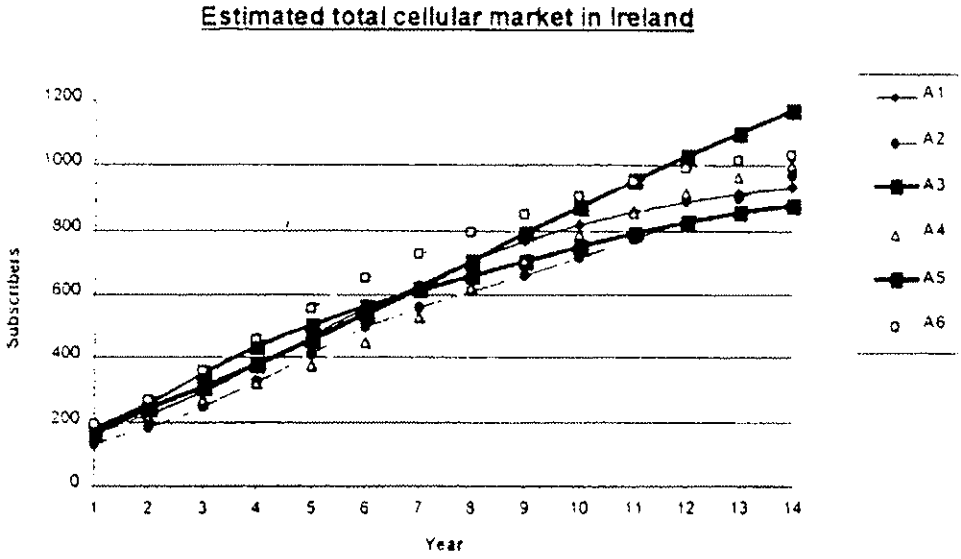


Figure 7. The estimated total cellular market in Ireland (x1000)

With the possible exception of A5, there is hardly any difference among the applications in relation to the projection of the total market. They all project around, or just below, 1 million subscribers in year 2009, which will be roughly equal to a degree of penetration of around 25%, i.e. close to the present level of penetration in for example Norway and Sweden. In the earlier part of the planning period, for example year 4, there is hardly any difference between the projections, when considering the uncertainty of forecasting the total GSM demand.

All applications take into consideration competition from other cellular systems than GSM1, e.g. TACS900, GSM3, and most likely, DCS1800. Most applications assume that the expansion of competition from a duopoly environment to an

industry structure with more than two operators will lower the tariffs and increase the penetration in Ireland. Conversely, if the duopoly remains intact throughout the planning period, it is indirectly concluded in some of the applications that these positive effects will not materialise.

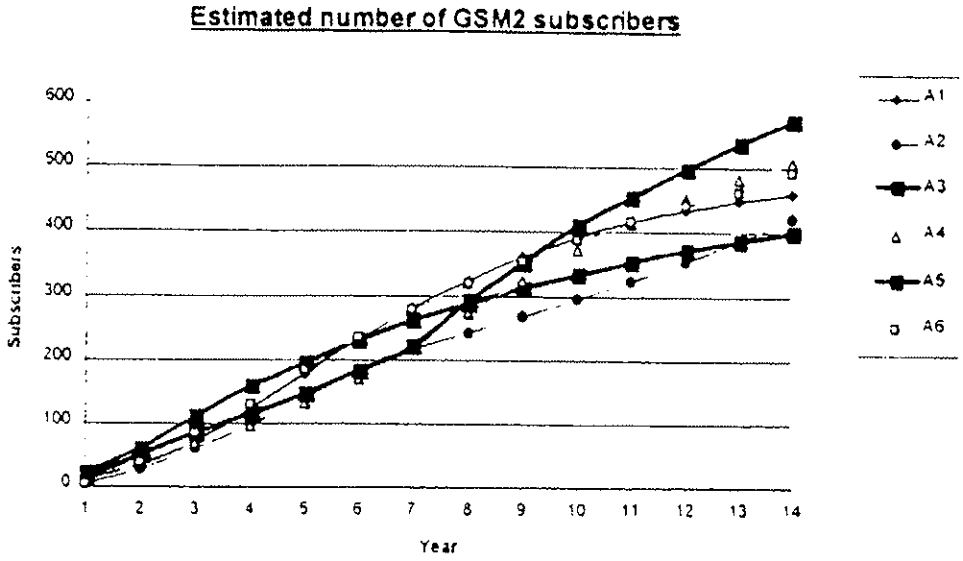


Figure 8. The estimated number of GSM2 subscribers (x1000) in the applicant's own network

As also seen from figure 8, the trend line illuminates a striking similarity among the projections concerning **the projected number of GSM2 subscribers in the applicant's own network**. Clearly, A5 has the highest long-range market penetration ambitions, whereas A3 quotes more modest projections with less than 70% of the projected subscriber base projected by A5 in year 2009. There is hardly any difference among the applicants, when the early years, for example year 4, are taken into consideration. A3, however, compares slightly better during the early years, including year 4.

Another demand indicator is the traffic generated. This indicator can be illuminated in various ways.

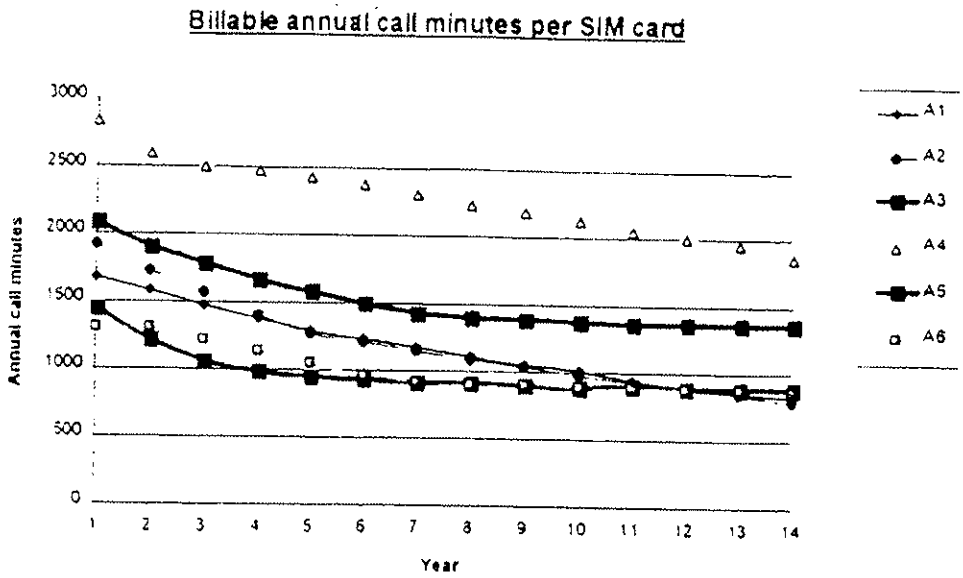


Figure 9. The projected billable annual call minutes per SIM card

As seen from figure 9, the projections on **the traffic generated in the GSM2 network** seem to be grouped around three categories. Most significantly, A4 has quoted the highest number of average call minutes per SIM card, whereas A1, A2, A3 and A6 all project the average traffic per subscriber to be approximately half of the traffic projected by A4. A5 is grouped somewhat in-between. However, all the applicants assumed a decrease in the development of the traffic, which mainly reflects the increased take-up of subscribers from the private consumer segment.

It is also noteworthy that A3, which has the highest penetration ambitions of all applicants during the early years as evidenced by figure 8, has the lowest ambitions concerning the traffic demand during the same years, see figure 9.

The evaluation of the market development has, however, not only taken the projected demand into consideration, but also a number of other indications which exert influence on the credibility of the approach to the development of the Irish market. Thus, also a number of other indicators will be described in the following sections, namely the relative consumer penetration, the degree to which the market and marketing plans are evidenced by market research in Ireland, the distribution strength, the segmentation, the dealer commissions/handset prices, the magnitude of the market share target, the communications planning, and the customer care and churn.

1. Market penetration (projected number of GSM2 subscribers in own network)	C	D	C	C	B	A
2. GSM market share (including traffic)	B	C	C	A	B	B
3. Consumer penetration	E	A	B	D	B	B
4. Market research	C	C	B	A	A	E
5. Distribution strength	C	D	B	C	A	E
6. Segmentation	D	E	A	C	B	B
7. Dealer commission handset prices	C	A	A	C	A	A
8. Marketing budget	A	C	D	E	A	A
9. Communications planning	D	E	B	C	A	D
10. Customer care and churn	C	C	B	E	A	B

Table 2. The award of marks concerning the dimension market development

The marks awarded under each indicator are summarised in Table 2. The demand projections are reflected in the first two indicators, where not only the long-term ambitions, but also the development during the early years, in particular year 4, has been taken into consideration (in accordance with the evaluation model outlined in appendix 3). The third indicator is the relative **consumer penetration** as expressed by the consumer/business subscriber partition. In the long run, A2 plans to take the largest proportion of private consumers (77%), followed equally by A5 and A6 (67%) and swiftly by A3 (comfortably above 50%). Consequently, these applicants have been awarded high marks concerning this indicator.

The fourth indicator, **market research**, has been found relevant insofar as the applicants have been requested to evidence and document their applications as much as possible. A4 and A5 have both carried out several types of market studies in Ireland, which warrants an A. A6, on the contrary, has explicitly dissociated itself from market analyses in the Irish market prior to licence award.

The fifth indicator is the **distribution strength**. A5 has here been awarded an A because it has the most elaborate distribution concept building on impressive preparatory work such that the risk of distribution failure is almost non-existing. A3 has been awarded a favourable mark (a B), since A3 in a convincing way has opted for the establishment of its own, wholly-owned service provider. A6 has not paid attention to the specific Irish environment, but seems to rely entirely on the transferability of experience in particular from the Swedish market.

The sixth indicator is **segmentation**. A3 has here been awarded the highest mark, since a convincing segmentation of the Irish market into 5 archetypes of customers has been developed and is consistently used in the application. A2 has here been awarded the lowest mark (an E), since it only provides a usage type of segmentation, which is not assessed as a true segmentation, the distinguishing criteria between segments are not specifically identified needs. A5 and A6 both

Dimension: Market Development	A1	A2	A3	A4	A5	A6
1 Market penetration (projected number of GSM2 subscribers in own network)	C	D	C	C	B	A
2. GSM market share (including traffic)	B	C	C	A	B	B
3. Consumer penetration	E	A	B	D	B	B
4. Market research	C	C	B	A	A	E
5. Distribution strength	C	D	B	C	A	E
6. Segmentation	D	E	A	C	B	B
7. Dealer commission handset prices	C	A	A	C	A	A
8. Marketing budget	A	C	D	E	A	A
9. Communications planning	D	E	B	C	A	D
10. Customer care and churn	C	C	B	E	A	B
Market development (subtotal)	**C**	**C**	**B**	**C**	**A**	**C**

provide some analysis, differentiating between light/heavy business segments as well as the light/heavy consumer segments.

The dealer commissions and the handset prices have also been taken into consideration as an indicator relevant to market development, since commissions and similar incentives are important vehicles to lower the entrance barriers to the GSM market. A number of applicants (A2, A3, A5 and A6) expose strong incentives to lower the entry barriers.

The size of the marketing budget in the hands of the operator has been assessed separately as an indicator in order to primarily reflect the ambitions of prospective operators to effectively build up the awareness in the Irish market. A5 has allocated most money to this budgetary item, followed by A3.

The communications planning prior to the closing date has also been evaluated as an indicator. As one extreme, A5 presents an elaborate market communications plan supported by advertisements and television commercials. As another extreme, A2 seems largely unprepared in this respect.

The tenth and last indicator assessed is **the customer care and churn**. Churn is a relevant indicator to take into consideration in addition to the customer care, because mobile customers have a higher propensity to disconnect and reconnect that have customers in the fixed network. In the detailed evaluation of this indicator a distinction has been made between 'brand churn' (disconnects from the GSM2 operator and connect to another operator) and 'other churn' (disconnects for various reasons). Again, A5 has presented the most detailed and customer-friendly care, including performance standards and quality control, leading forward to high and sustained focus on churn, including brand churn. A4, on the contrary has only presented a short, general description of customer care and has presented an exceptional level of churn during the initial years (25%), expressing low confidence in its ability to maintain its subscriber base from the outset.

Summarising across all the indicators considered, A5 has provided the most elaborate and consistent approach to market development which leaves no doubt that A5 will give a substantial contribution as a driver of market development in Ireland. A3 has a number of strong points, but is assessed as weaker than A5, and therefore A3 warrants a B. All the other applicants have fewer strong points and a number of weaker points, and they have subsequently been awarded a C.

4.1.2 Coverage

The coverage of a mobile telephone network is a fundamental quality directly understandable and measurable by all customers: *Will it be possible to initiate and complete a call from my immediate geographic position?*

A good coverage is necessary for a successful market introduction of any GSM operation and, hence, a thorough evaluation of this dimension is an important contribution to the assessment of the different applicants. The subject of 'coverage' has been included in the marketing aspects for obvious reasons, but it is also a product of the technical construction of the network. Consequently, a mix of market-related and technical indicators/subindicators has been applied in order to reflect the composite nature of this matter.

The obvious indicator of coverage is the roll-out plan which displays the applicant's intended speed and completeness in providing coverage.

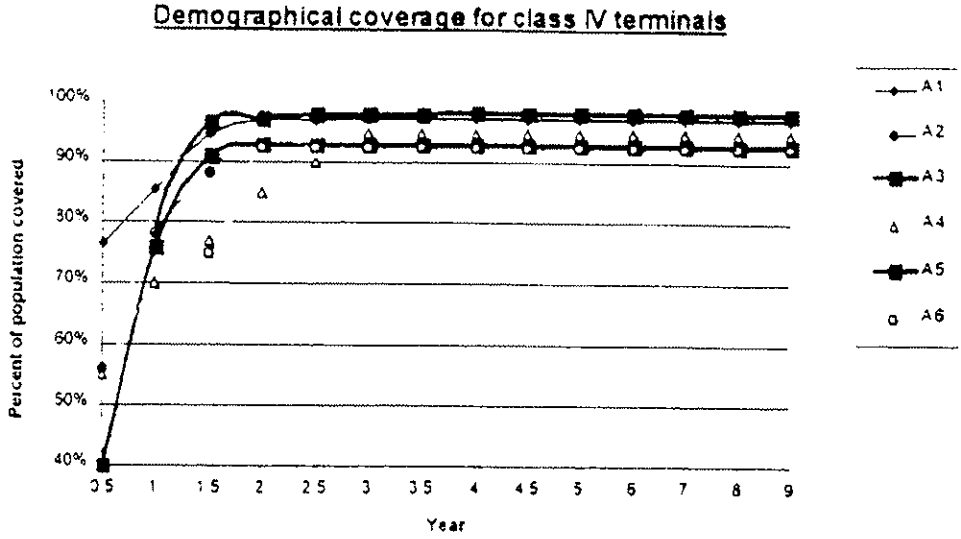


Figure 10. Offered coverage in percent of the Irish population (class IV terminals, outdoor)

Figure 10 is based on the mandatory tables provided by the applicants. It shows that all applicants in due time intend to provide a comprehensive coverage serving more than 90% of the population in less than 4 years. The minimum requirement of the RFP document is thus fulfilled, but from a market-introduction point-of-view, it is furthermore important to focus on coverage during the first years of operation when the new business must build up the confidence of its customers. Detailed information on this subject is found in the text sections of the applications.

A1, A3, and A4 commit themselves to launch commercial operations by mid-96 with an initial coverage of 56%, 40%, and 55% of the population, respectively. A2 and A5 postpone the launch until the beginning of fourth quarter of 1996, but A5 makes use of this extra time to establish coverage for 80% of the population at launch. A6 has the latest launch of operations with a start in December 1996. The launch information should be related to information about the point in time when 90% coverage of the Irish population has been obtained. This point is reached by A1, A3, and A5 in June 1997, with A1 as the first-comer, while A2 and A6 take a further half year and A4 a full year to reach the same level.

In terms of **the planned roll-out,** A1 and A5 are given the highest marks (A) due to A1 providing an early and reasonably high demographic coverage at launch and A5 offering a remarkably higher launch coverage slightly later. A3 is rated a little lower (B) primarily because of the relatively low coverage at launch (40%) which is considered somewhat questionable for customer acceptance.

The evaluation of the coverage dimension has been further influenced by 3 other indicators which serve to substantiate the roll-out plan from a technical and a logistic point of view and furthermore demonstrate the applicants' understanding and willingness to take special precautions where extraordinary coverage needs could be expected. In total, the viability of the projected coverage is assessed with an equal

weighting of the roll-out plan (as described above) and the applicants' radio link budget assumptions, site acquisition preparations, and special coverage provisions.

1. Roll-out plan	A	C	B	C	A	C
2. Radio link budget	A	A	A	B	A	B
3. Site acquisition	C	B	A	B	A	D
4. Special coverage	B	D	A	D	A	E

Table 3. The award of marks concerning the dimension coverage

The summary of the marks, as presented in Table 3 shows that the indicators 2, 3, and 4 slightly influence the picture provided by the marks of the roll-out plan. A3 is raised to the highest rating (where also A5 remains) due to an excellent performance on the other indicators, while A1 only warranted a B primarily due to an unconvincing site acquisition preparations.

The indicator **radio link budget assumptions** was included for establishing the technical credibility of the postulated coverage. The indicator encompasses a control of the applicants' radio link budget calculations with design parameters as BTS transmitter power level, applied outdoor field strength, and isotropic path loss, all of which are relevant for assessing the probability of having coverage within the area of a radio cell. Also the assumed building penetration losses have been investigated in order to justify the claimed in-door coverage. In general, all applicants have provided complete and adequate information on these subjects, but A4 and A6 did not verify that this information was actually valid for Ireland, whereas the other applicants A1, A2, A3, and A5 have documented local efforts concerning drive tests and field measurements to substantiate their design assumptions.

The third indicator concerning **site acquisition preparations** is particularly important for those applicants claiming the earliest launch of commercial operation. Preparations must include actions to overcome the Irish planning permission procedures as well as documented access to identified sites, which in turn should lead to considerations of environmental constraints. In this respect, A5 has completed an unusually comprehensive study and due to the assets of the consortium partners also A3 has an excellent background for launching the service at the planned time.

The fourth indicator in which the applicants provisions for **special coverage** are evaluated, is composed of subindicators concerning coverage of railway lines, road/street traffic hotspots, border regions, and other areas outside usual traffic demand as well as provisions for maritime coverage. In addition, special attention has been paid to coverage in the Dublin area. A3 and A5 (and to a slightly minor degree A1) have demonstrated the experience obtained from their activities elsewhere in Europe by providing adequate plans and information on these subjects. A6 did not at all address these subjects in the application, hence an E was awarded.

4.1.3 Tariffs

The evaluation has also paid considerable attention to the tariff dimension, since this dimension is visible for the customers. In addition to the price for the terminal

Dimension: Coverage	A1	A2	A3	A4	A5	A6
1. Roll-out plan	A	C	B	C	A	C
2. Radio link budget	A	A	A	B	A	B
3. Site acquisition	C	B	A	B	A	D
4. Special coverage	B	D	A	D	A	E
Coverage (subtotal)	**B**	**C**	**A**	**C**	**A**	**D**

equipment, the costs for the customers typically include call charges, initial charges, subscription charges as well as charges for supplementary and value added services.

The proposed tariff schemes vary markedly among the applicants, and they are furthermore influenced by metering and billing principles, discounts, special packages, off-peak reductions, free minutes and similar offers. In addition, there is considerable variation in the amount of extra services and features, the customers get for an ordinary subscription. Although one should be cautious when comparing single indicators of often complex tariff and service packages, the evaluators decided to proceed indicator by indicator, and supplemented afterwards by analyses in order to identify potentially distorting effects in such a methodology.

One of the indicators defined prior to the closing date is the OECD-like basket, comprising 1/3 of the initial charge corresponding a 3 year amortisation period, one yearly subscription and 1500 outgoing call minutes during peak hours.

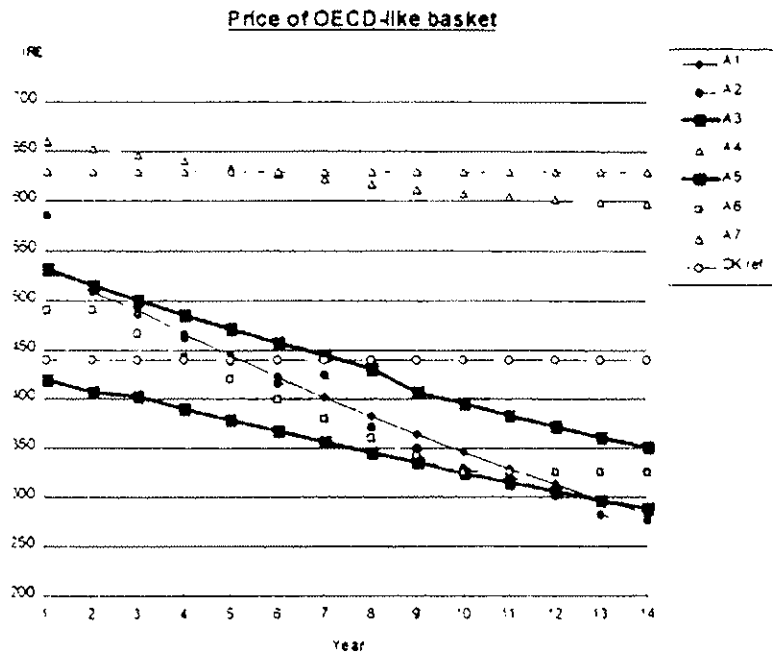


Figure 11. Tariff comparison on the basis of the OECD-like basket

The most significant information provided in figure 11 is that the applicants in general foresee a level of tariffs comfortably below the existing tariff level of Eircell (symbolised by the acronym A7) and at the same tariff level as one of the cheapest EU countries (Denmark, symbolised by the acronym DK ref). This picture, which only represents one package, can be further refined by looking at call volume impact on the tariff, with the fixed part of OECD-like basket (1/3 of the initial charge and one yearly subscription) as the starting point.

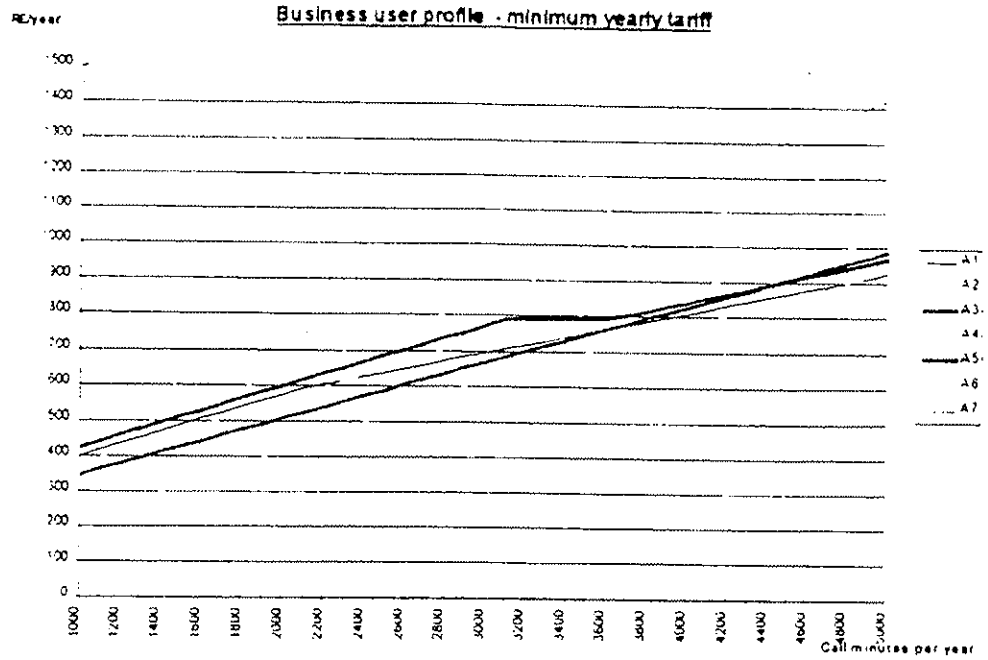


Figure 12. Basket comparison of a business user profile

A basket of an Irish business user profile as presented in figure 12 roughly confirms the general picture exposed from the OECD-like basket. The same appears to be the case with a basket comprising a consumer type of profile as presented in figure 13.

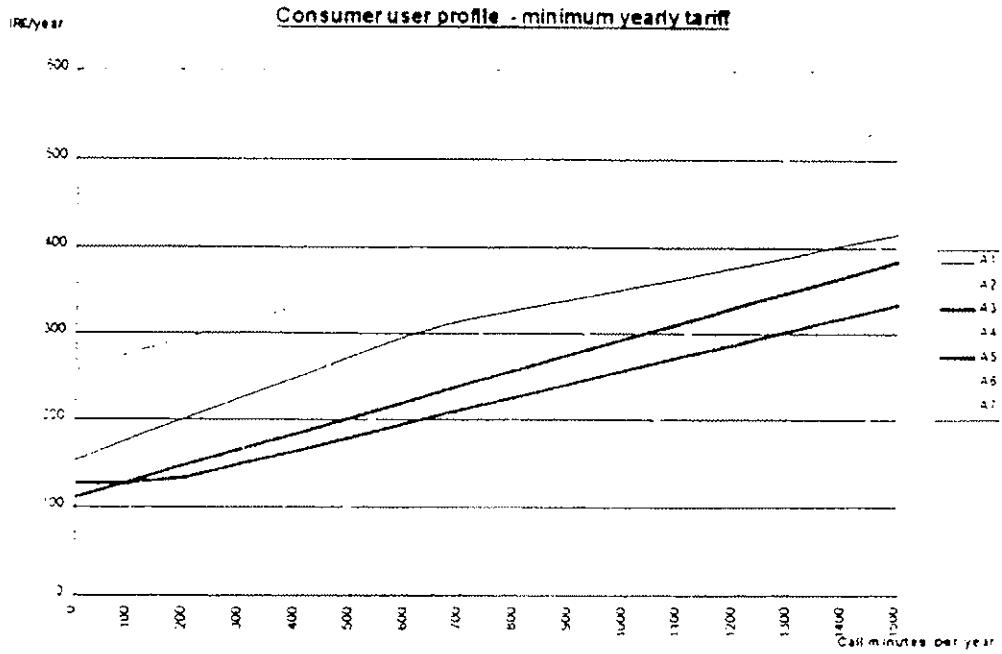


Figure 13. Basket comparison of a consumer user profile

Both refinements of the OECD-like basket come out with A6 as the cheapest and A2 as the most expensive operator. One should, however, be cautious when comparing these tariffs for a specific basket, because the actual bill may be influenced by for example the metering and billing principles and by discounts.

In order to award the specific marks to the applications, the following indicators have been defined: The initial charge, the basket comparison of a consumer user profile, the basket comparison of a business user profile, the definitions of the peak and off-peak periods, the metering and billing principles suggested, special tariff offers, international roaming surcharge, international call charges and the OECD-like tariff basket.

When the evaluation and the award of marks to these 10 indicators had taken place, several supplementary analyses were conducted, and the results are summarised in appendix 6. The main conclusion to be drawn from this is that applications with time-true metering principles and special offerings, such as discounts, are in fact disadvantaged by the hard quantitative basket comparisons. This is particularly the case of A5 and to a lesser extent A1, A3, and A6.

1. Initial charges	B	B	A	B	C	B
2. Consumer graph	E	E	B	C	C	A
3. Business graph	C	E	B	C	D	A
4. Peak period	B	C	A	C	A	A
5. Metering and billing principles	A	C	C	C	B	A
6. Special offering	B	C	A	C	A	B
7. International roaming surcharges	B	D	B	B	B	B
8. International call charges	C	E	A	C	A	C
9. OECD-like basket	D	D	B	C	D	A

Table 4. The award of marks concerning the dimension tariffs

The award of marks is summarised in Table 4 including the marks awarded to each indicator under the tariff dimension. In general, A6 proposes the lowest tariffs waiving the subscription charge due to a certain consumption of traffic minutes, whereas A2 proposes the highest tariffs.

A1, A3, A4 and A5 all propose moderate tariffs below the present level of Eircell. However, in particular A3 and A5 have a number of appealing special tariffs, which in practice will benefit many customers such that the actual bill will be cheaper than presented in figures 11, 12 and 13.

The difference between A3 and A5 is quite small, which has been confirmed by a supplementary analysis (see appendix 6). It could be questioned whether the low tariffs proposed by A6 is consistent with for example its revenue projections and an IRR at an appropriate level. The answer to these questions, however, has been transferred to the risk analysis presented in chapter 4.

Dimension: Tariffs	A1	A2	A3	A4	A5	A6
1. Initial charges	B	B	A	B	C	B
2. Consumer graph	E	E	B	C	C	A
3. Business graph	C	E	B	C	D	A
4. Peak period	B	C	A	C	A	A
5. Metering and billing principles	A	C	C	C	B	A
6. Special offering	B	C	A	C	A	B
7. International roaming surcharges	B	D	B	B	B	B
8. International call charges	C	E	A	C	A	C
9. OECD-like basket	D	D	B	C	D	A
Tariffs (subtotal)	**C**	**D**	**B**	**C**	**C**	**A**

The initial charges are evaluated at launch. Clearly, A3 has low initial charges, which are waived for the first 2 years, and has thus received an A. A5 has the same standard initial charge, which is among the highest, probably related to the variety of included start-up services. The other applicants have several package dependent initial charges.

For **consumers**, the **graph** presented in figure 13, is mainly relevant for up to 1200 outgoing call minutes per year. A6, generally the applicant with the lowest tariffs, has a kinked graph, which is mainly due to special circumstances in the structure of packages. A6 has received an A for the very low tariffs for consumers generating between 400 and 1200 minutes a year. Clearly, A1 and A2 have the highest tariffs and consequently they have been awarded the mark E. A3, A4 and A5 lie in-between these brackets.

The more **business oriented graph** presented in figure 12, reveals similar comparative positions to those in the consumer oriented graph for A2 and A6. Focusing on business user ranging from 1500 to 3000 yearly minutes, the remaining applications have received marks between the A of A6 and the E of A2. The fact that A5 improves its position for high volume business users above 3000 year minutes of use has not been taken into consideration.

The consumer graph was designed with 80% of the traffic in off-peak and 20% in peak hours, whereas the business graph was designed with 80% of the traffic in peak hours and 20% in off-peak hours. However, **the definition of the peak and off-peak periods** has an impact on the deal for the customers. It appears from the applications and the answers to the written questions that A3, A5 and A6 have the most attractive definition of peak hours seen from the customers' point of view (corresponding to 8 am to 6 pm, Monday to Friday), whereas A2 and A4 have less attractive definitions (8 am to 8 pm).

The next modifying indicator to the general comparisons made is **the metering and billing principles**. Seen from the customers' point of view, A1 and A6 are the best with pure per-second-billing, thus deserving an A. No one of the applications assumes call set-up charges. The other applications assume billing in 10 seconds increments and the charging of a minimum of 30 seconds per call, and they have consequently been awarded the mark C, except for A5. A5 has expressed an intention of changing to per second billing, leaving out the 10 second units and the minimum of 30 seconds, as well as A5 states that the business case is based on per second billing.

In practice, the operators behind the applications will supply a number of **special offerings**, which will modify or even change the basis for the comparison of the applications. Thus, special tariffs have been used as an indicator. A3 has 40% reductions to certain foreign countries, a special home town tariff package, volume discounts, a package with half rates for calls within a group of 5 persons and the possibility of calling 5 other pre-identified subscribers at 5 pence per off-peak minute. A5 matches these offerings with for example discounts for corporate subscribers, special home town tariff package, a family package including extra SIM cards with restricted call possibilities at low costs, as well as discounted call charges between nominated family members, plus affinity group calls at reduced rates. Furthermore, A5 plans to make special features and to launch a number of special tariff promotions. Consequently, both A3 and A5 have been awarded an A.

Except for A2 and partly A4, which have been awarded a C, the remaining applications all provide some special offerings.

As a specific tariff element, attention has also been paid to the **international roaming surcharges**. All applications, with the exception of A2, project a 15% surcharge on the roaming abroad tariffs, and have been awarded a B. A2 suggests a fixed amount, which will normally be more expensive than the 15%, and consequently, A2 has been awarded a D. It could be added that the projected tariffing of A2 is not in accordance with the view of the signatories to the GSM MoU in relation to roaming.

Another international tariff element is **the international call charges**. Concerning this indicator, A5 will only charge Telecom Éireann's fixed international call charges without any mark-up, and this deserves an A. A3 has quoted proprietary tariffs close to the tariffs of Telecom Éireann and this has been assessed as almost as favourably as A5. A1, A4 and A6 will add their national airtime charge to the international call charges of Telecom Éireann, and they have all received a C. Like A3, A2 has quoted proprietary tariff, but A2's tariffs generally exceed the international call charges of Telecom Éireann to such an extent that an E has been awarded.

The **OECD-like basket** defined in the tender specifications has been used as the last indicator with the quoted tariffs in year 4 as the basis for comparison. A4 and A6 did not quote their most advantageous tariffs for the defined OECD-like basket, but Andersen Management International have re-calculated their baskets, which leads to a more favourable result than these applicants deserve, based on their own quotations. Consistent with the graphs of figure 11, A6 has been awarded an A, A3 a B, A1, A4 and A5 all have been awarded a C, whereas A2 has come out with a D concerning this indicator.

This concludes the so-called indicator-based evaluation of the tariff dimension. However, reference is also made to the risk/credibility issues dealt with in chapter 5 of this report and the supplementary analyses summarised in appendices 6 and 7.

4.1.4 International roaming plans

The plans for international roaming, the innovative GSM feature that may extend the service when Irish GSM customers are abroad and when foreign GSM communicators visit Ireland, have been described in the applications in such a widely different way that it has not been possible to carry through a quantitative comparison of the applications. Admittedly, the applicants face a number of imponderables prior to the closing date, and it is impossible to conclude a substantial amount of roaming agreements without having status as a licensee.

The evaluation of this dimension has therefore been carried out as an entirely qualitative evaluation with focus on the degree of creativity and commitments in the applications by way of the following indicators: The understanding of GSM roaming issues, the commitment of European GSM roaming, and additional roaming features.

1. Understanding of GSM roaming issues	A	E	C	E	B	D
2. Commitment to European GSM roaming	A	D	A	B	B	A
3. Additional roaming features	A	D	D	B	D	D

Table 5. The award of marks to the dimension international roaming plans

A significant difference appears between the applications concerning this dimension, with A1 as the best and A2 as the least satisfactory application. The other applications, i.e. A3, A4, A5 and A6, all have received moderate marks.

The first indicator, **the understanding of GSM roaming issues**, has been scored on the basis on what has been reflected in the various applications only. A1 shows by far the most understanding, with a considerable amount of details contained in both the technical and marketing volumes of the application. A1 therefore deserves an A. A2 and A4 show no understanding of the complexity of the negotiating process necessary to set up international roaming, and they have therefore received Es. A5 displays a good level of understanding gained from relevant experience and allows for a time-frame for concluding roaming agreements which has demonstrably turned out to be realistic. A3 also displays good understanding but seems to rely on an extremely tight time frame in order to conclude roaming agreements. While A6 displays considerable knowledge of the technical requirements for the establishment of roaming, no mention is made of the timetable to allow for the conclusion of roaming agreements.

The next indicator, **the commitment to European GSM roaming**, focuses on how the applications reflect commitments as well as a careful evaluation of the perceived ability to conclude the number of outlined agreements. A1, A3 and A6 commit to a given number of European countries at launch and demonstrate enough capability in the applications to give comfort that the promised levels of roaming will be achieved, thereby being awarded an A. A2 has no particular focus on Europe and does not demonstrate the needed capability in the application, obtaining not more than a D. While naming a number of European GSM countries at launch, A4 does not adequately demonstrate the necessary capability to reach its targets. A5 has prioritised European countries at launch, although it mentions only one country explicitly, and the application provides evidence that the consortium has the needed capability.

As the last indicator, it has been investigated whether additional international roaming features are offered. A2, A3, A5 and A6 only discuss the standard GSM roaming provisions, therefore, they have been awarded a D. A1, however, has committed itself to extensive services to facilitate or substitute roaming, for example with roaming arrangements with non-GSM networks world-wide and with rental of equipment, and A1 has thus received an A. A4 provides some general details of arrangements for roaming on non-GSM networks and has thus received a B.

Dimension: International roaming plans	A1	A2	A3	A4	A5	A6
1. Understanding of GSM roaming issues	A	E	C	E	B	D
2. Commitment to European GSM roaming	A	D	A	B	B	A
3. Additional roaming features	A	D	D	B	D	D
International roaming plans (subtotal)	**A**	**D**	**C**	**C**	**C**	**C**

4.2 Technical aspects

The dimensions of the technical aspects are identified as radio network architecture, network capacity, performance guarantees, and frequency efficiency. Also the subject of 'blocking and drop-out rates' was originally considered as an ingredient in the technical evaluation, but with the applicants using incomparable calculation methods for these parameters it was decided to omit direct comparison of the submitted figures. Instead blocking and drop-out rates have been subject to a supplementary analysis, cf. appendix 5.

The applied 4 dimensions are related to different criteria mentioned in paragraph 19 of the RFP document. Radio network architecture and network capacity form part of 'indent 2' while the two other dimensions are related to indents 7 and 8, respectively. For this reason it was decided that the marks awarded under the different dimensions should not contribute with the same weight to the calculation of the final marks of the technical aspects.

Technical aspects	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**
1. Radio network architecture	C	C	B	B	A	D
2. Network capacity	C	D	C	B	A	C
3. Performance guarantees	D	E	C	B	A	C
4. Frequency efficiency	A	C	A	A	A	A
Technical aspects (subtotal)	**C**	**D**	**B**	**B**	**A**	**C**

Table 6. Technical aspects: Award of marks

A5 provides a technical solution of quality and is considered as the strongest of the applications with the award maximum marks in all dimensions. A3 and A4 have both been awarded a B.

A3's solution has been awarded low marks in overall network capacity as has the capacity of A1, A2 and A6. A1, A2 and A6 furthermore lack high scores on the definitive dimension of radio network architecture. It should be emphasised that these ratings are also a reflection of the information level actually provided by each applicant on the different indicators.

The licence conditions for the finally selected applicant should be made up to reflect the technical solution upon which the marks were awarded.

4.2.1 Radio network architecture

The design and the construction of the radio network is the obvious foundation for the entire mobile communications operation in terms of coverage, capacity, and quality. An essential part of the network design is the applied structure of radio-cells covering the service area and, hence, important indicators of the architecture are the number of antenna sites and the number of cells.

The number of antenna sites provides information on the minimum number of cells to be deployed and thereby the potential density of coverage. Also, this indicator has a strong influence on the total investment in network equipment.

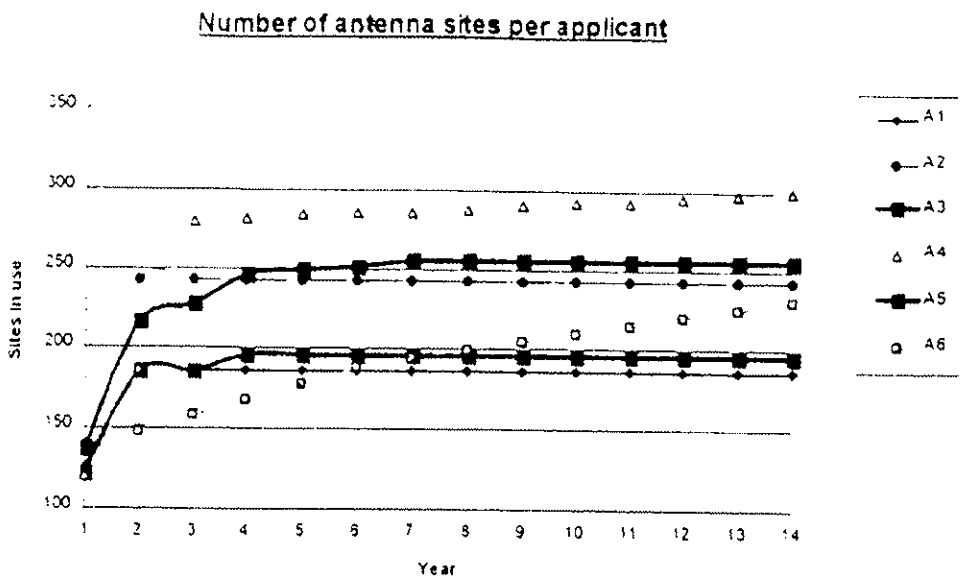


Figure 14. The number of antenna sites per applicant

Evidently the applicants have different architectural approaches in terms of this indicator with A4 as the strongest. Awarding an A to A4 leads subsequently to awarding a B to A2 and A5, and a C to the remaining applicants. Five of the applicants obtain within a few years a stable situation, while A6 keeps adding new sites throughout the observation period.

The second indicator **number of cells** is of course depending on the first indicator, but provides further information on the planned use of sectorised antennas and thereby on network quality and capacity. For this indicator A5 is awarded the highest mark with A4 as a close second and A3 as number three. A2 and A6 are both awarded Ds. Specifically A1 has a very low number of cells in the mature network. This is considered a weakness in their solution leading to the award of only an E.

1. Number of antenna sites	C	B	C	A	B	C
2. Number of cells	E	D	C	B	A	D
3. Cell planning	A	A	A	A	A	B
4. POI	B	A	A	A	A	B
5. Redundancy	A	C	A	B	A	D
6. Dublin area	A	D	A	D	B	E

Table 7 The award of marks concerning the dimension radio network architecture

The marks awarded under each indicator are summarised in Table 7. Further to the two first indicators the third indicator **cell planning** reflects the professionalism

Dimension: Radio network architecture	A1	A2	A3	A4	A5	A6
1. Number of antenna sites	C	B	C	A	B	C
2. Number of cells	E	D	C	B	A	D
3. Cell planning	A	A	A	A	A	B
4. POI	B	A	A	A	A	B
5. Redundancy	A	C	A	B	A	D
6. Dublin area	A	D	A	D	B	E
Radio network architecture (subtotal)	**C**	**C**	**B**	**B**	**A**	**D**

with which each applicant has planned his cell structure. As it appears all applicants have demonstrated a high degree of professionalism making use of state-of-the-art cell planning techniques and tools. Only A6 is rated a little lower, mainly due to limitations in the contents of the application.

The fourth indicator **Points of interconnect (POI)** reflects the approach and the philosophy applied in connecting the GSM network with the PSTN. Again the applicants are almost considered equal, however, with A1 and A6 rated a little lower due to very brief treatment of the subject in their applications.

The redundancy indicator shows the applicants' consideration of backbone network design and traffic routing capabilities with emphasis on the possibility of alternative routing in case of line errors or congestion. A1, A3 and A5 all have described competent and safe solutions and are awarded an A. A4's solution seems reasonable, but is not described in much detail, whereas the suggestions of A2 and A6 are comparatively weaker.

The sixth and the last indicator places special attention on the radio network deployed in the **Dublin area** where the most critical conditions are expected. Design of this part of the architecture requires local knowledge of adequate site positions and hotspots which not all applicants seem to have investigated. A1 and A3 have made a well documented and comprehensive planning of this part of the network closely followed by A5. A2 and A4 have made very little in this area, and A6 has provided nothing at all.

4.2.2 Network capacity

The network capacity is, besides the coverage, of greatest importance for the perceived customer satisfaction with the service. By adding extra capacity the operator makes his network less sensitive to fluctuations in number of customers and traffic level, but on the other hand capacity costs investments. All applicants will provide surplus capacity in the early years of operation, but as the customer base and the traffic volume increases it is especially important to provide sufficient capacity where it is mostly needed, i.e. in the Dublin downtown area (cf. indicator no 6 in section 3.2.1).

The following capacity considerations make use of 4 indicators all based on average, overall capacity calculations .

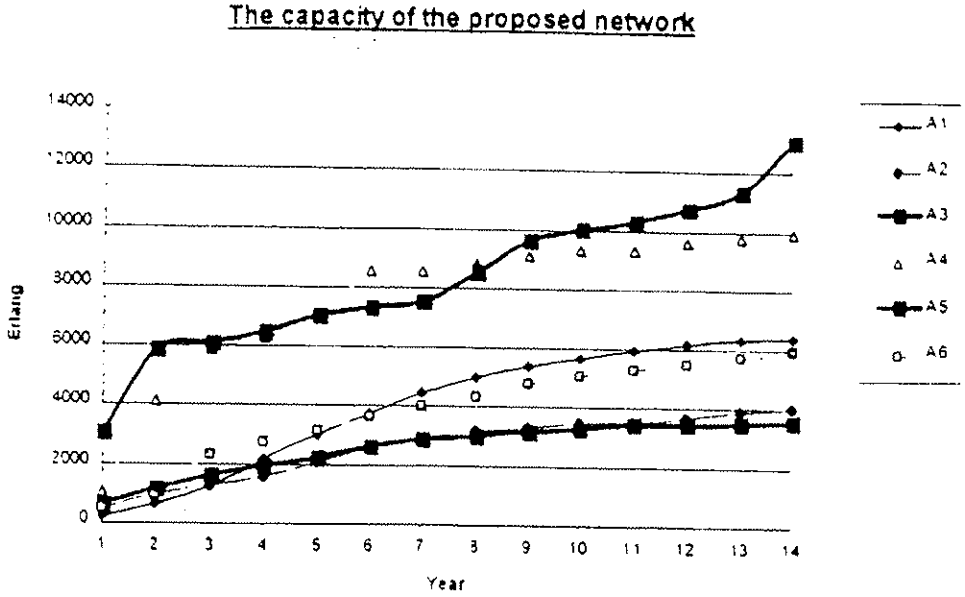


Figure 15. Capacity (in the radio part) of the proposed network (Erlangs)

The capacity of the radio network is planned in order to respond to the traffic demand in busy hour. It is a highly customer-relevant quality of the solution and especially business users would require the capacity to always be sufficient. As it appears, A5 has designed a network with a considerable capacity closely followed by A4 and with the other applicants at lower capacity levels. However, the offered capacity must be assessed in relation to the size of the projected customer base. This is accomplished by calculating the capacity per subscriber and the spare capacity (based on the projected usage per subscriber).

Evaluation of the average capacity per subscriber still points to A5 as the best performer with A4 as the second. The figures decrease over the planning period for all applicants and especially A2 and A3 become very low in year 2009. The same trend is repeated in the calculated spare capacity, where A4 and A5 have provided an abundant capacity all through the planning period and with also A6 offering a network with a good spare capacity. A1, A2 and A3 have suggested a spare capacity to the low side, and in particular A1 has constantly the same low value all through the planning period. Special attention has been paid to this indicator in the assessment of the dimension.

1. Capacity of the (radio) network	C	C	C	A	A	A
2. Capacity of own infrastructure	A	C	A	C	B	E
3. Capacity of interconnect	B	D	B	A	A	C
4. Capacity of central components	A	B	A	B	A	C

Table 8. The award of marks concerning the dimension network capacity

Dimension: Network capacity	A1	A2	A3	A4	A5	A6
1. Capacity of the (radio) network	C	C	C	A	A	A
2. Capacity of own infrastructure	A	C	A	C	B	E
3. Capacity of interconnect	B	D	B	A	A	C
4. Capacity of central components	A	B	A	B	A	C
Network capacity (subtotal)	**C**	**D**	**C**	**B**	**A**	**C**

In general A5 plans a solution of high **capacity of radio network** throughout the different network elements. This solution is furthermore well substantiated and is here awarded an A. A4's solution is weaker on own infrastructure capacity, hence a B, and the other applicants have lower performance. A2 is lowest which is due to lack of factual information in the application.

The indicator **capacity of own infrastructure** is not easily quantifiable. It has been assessed from the applicants' own presentations of the dimensioning procedures applied in the network design and from the viability of the approach to establish their own infrastructure. Some of the applicants have furthermore indicated the number of interconnecting 2MB/sec. lines between their network components. A1 and A3 have presented the most convincing design, including discussion of as well traffic capacity as signalling capacity. A5's solution is almost as good, but seems to prefer construction of a new infrastructure rather than making use of existing facilities. This is considered slightly less favourable from a timing perspective.

The third indicator is the **capacity of the interconnect** to PSTN. This has been assessed by extracting the number of POIs, the number of interconnecting 2 MB/sec lines through the POIs, and the average number of subscribers per interconnecting line. A4 and A5 have planned a remarkably high capacity at this interface leading to the award of an A. Also A1 and A3 have described a thorough solution, however with a more limited capacity, while A2 and A6 have not provided sufficient information. This indicator has been given a low weight in the aggregated scoring of the dimension.

The fourth and the last indicator was originally intended as an assessment of the **capacity of the central components** in terms of the number of subscribers that could be served. This information was, however, not readily available from any of the applicants so instead the mere number of main network elements has been assessed. A1, A3 an A5 have all suggested a well balanced and a well deployed network with A2 and A4 almost as good. A6 has suggested a network with a remarkably low number of BSCs without any further explanation. This indicator has been given a low weight in the aggregated scoring of the dimension.

4.2.3 Performance guarantees

The RFP document indicates that the idea of including this dimension is to give the applicants an opportunity to emphasise how strongly they intend to honour the 'promises' (or design objectives) presented in their applications. This could e.g. be demonstrated by issuing relevant performance guarantees, however, leaving it to the inventiveness of each applicant to suggest the relevant guarantee conditions.

The assessment of this dimension is not directly quantifiable even if some of the applicants have suggested penalty-amounts in case of non-compliance. Instead the subject has been covered by investigating the applicants' general dealing with the concept of 'performance guarantees' as well as procedures indicated to remedy non-complying, guaranteed performance targets.

Also the nature of the committed performance targets has been studied as well as the offered (legally binding) penalties to be suffered by the applicant in case of non-compliance.

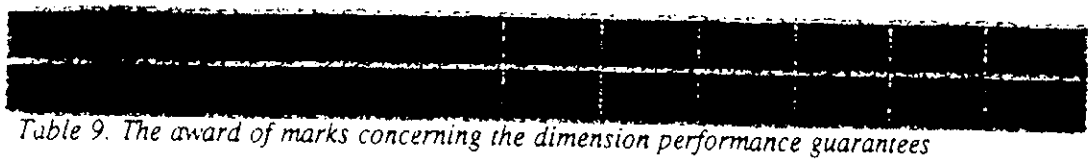


Table 9. The award of marks concerning the dimension performance guarantees

A4 and A5 have as the only applications suggested a legally binding guarantee with built-in penalties. A5 has provided comprehensive and satisfying information on all indicators incl. a penalty clause in case of non-compliance with coverage/roll-out milestones and the guaranteed performance level Hence the rating A

A4 has provided a brief information on the different indicators incl. a penalty clause in case of non-compliance with coverage/roll-out milestones The penalty amounts are considerably lower than those of A5 Hence the rating B

A3 has not presented any guarantee obligations, but suggests a number of "technical" action-plans (which may invoke expenses) in case of proved non-compliance. This is considered poorer than A4, and hence the rating C is decided

A6 has not presented any guarantee obligations, but realises the nature of the "guarantee requirement" by suggesting co-operation with the Department to develop a suitable guarantee structure so that A6's performance can be measured on a regular basis. This is considered poorer than A4, but not below A3 Hence the rating C

A1 has addressed the concept of performance guarantees by listing a number of network design target-values without indicating remedial procedures in case of non-compliance Consequently, the applied heading "performance guarantee" is misleading and should rather be "design objectives" This is considered poorer than A3 and A6, and hence the rating D is decided.

A2 has not addressed the concept of performance guarantees (e g. in a dedicated section of the application), and the applied network design target-values must be extracted (by the reader) from a variety of positions in different parts of the application Hence the rating E.

4.2.4 Frequency efficiency

The frequencies allocated for the Irish GSM2 service are limited in number and should in principle be exploited efficiently. Good frequency planning is a demanding discipline which calls for experience as well as consideration of local details in the radio propagation patterns. Also, good planning will result in an increased capacity of the network as well as in a better quality of communication as perceived by the customers.

Avoiding that a considerable part of the allocated spectrum is used only occasionally during busy hour is one example of good frequency use. An effective traffic and network planning should tend to obtain an evenly distributed traffic throughout the day by means of market/traffic regulation and by a good network design. A quantifiable indicator in this respect is **the peak/mean traffic ratio** which separates the applicants in 3 classes. A3 and A4 obtain a value between 2 and 3 of the indicator which is awarded an A. A5 and A6 come out with a value between 3 and 4, good for a B, while A1 and A2 stay above 4.

Dimension: Performance guarantees	A1	A2	A3	A4	A5	A6
Performance guarantees (subtotal)	D	E	C	B	A	C

1. Peak/mean traffic ratio	C	C	A	A	B	B
2. Number of 200 kHz channels	A	B	B	B	B	A
3. Frequency economy factor	A	C	C	B	B	B
4. Cells per site	C	C	B	C	A	C

Table 10. The award of marks concerning the dimension frequency efficiency

The marks awarded under each indicator are summarised in Table 10. Even if the different indicators display a certain variety in the scorings, it was during the qualitative evaluation understood that the applicants in general showed a very efficient use of the allocated frequencies and that consequently the majority of applicants should be awarded an A. Only A2 were found to have a generally poorer performance and, hence, was awarded a C in the summary.

The second indicator is **the number of 200 kHz channels** actually called for in each application, and figure 16 provides an overview of these demands.

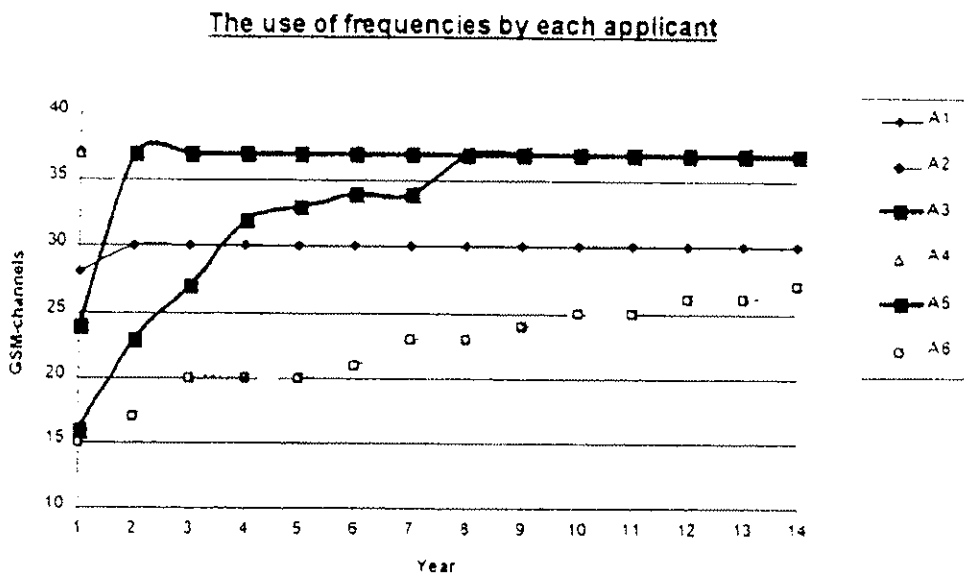


Figure 16. The use of frequencies by each applicant

Obviously, A1 has opted for a solution in which only 30 frequencies are needed. This is awarded an A in this indicator, which is also the result of A6 due to the generally low usage of frequencies. A2, which had misunderstood the required information in the mandatory tables on frequencies as the number of 200 MHz channels were interpreted as the total number of installed TRXs, has stated in a written answer that no more than the allocated frequencies are required. The other applications project some time in the planning period to make use of all the allocated 37 channels.

Dimension: Frequency efficiency	A1	A2	A3	A4	A5	A6
1. Peak/mean traffic ratio	C	C	A	A	B	B
2. Number of 200 kHz channels	A	B	B	B	B	A
3. Frequency economy factor	A	C	C	B	B	B
4. Cells per site	C	C	B	C	A	C
Frequency efficiency (subtotal)	**A**	**C**	**A**	**A**	**A**	**A**

The third indicator is the calculated **frequency economy factor** which reflects also the way the available frequencies are turned into useful network capacity.

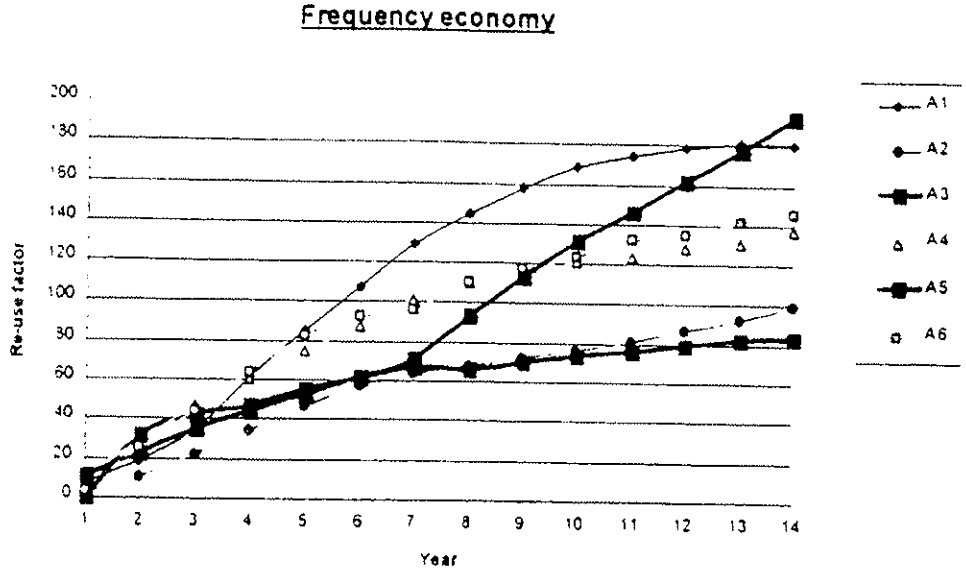


Figure 17. Frequency economy

A1 has for the majority of the planning period the highest value of this factor (see figure 17) due to the lower number of applied frequencies (see figure 16). This results in the award of an A, whereas A4, A5, and A6, all having good values, are awarded a B. Particularly A5 shows at the end of the planning period a value even higher than A1's due to the offered higher network capacity. A2 and A3 are in time separated out as those applicants with the lowest frequency economy.

The fourth and the last indictor is the average number of **cells per site** which reflects the ability of the applicants to apply sectorisation and thereby an intensified frequency reuse. A5 has clearly the highest value (2.5) of this indicator, which is awarded an A. A3 obtains a B for the value 1.8 while the remaining applicants stay at lower values (1.4 - 1.6).

4.3 Management aspects

The management aspects have been evaluated by just one dimension, namely the experience of the applicant. The award of marks to this dimension and to the subtotal of the management aspects will therefore be identical.

Management aspects	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**
1. Experience of the applicant	C	D	A	C	B	C
Management aspects (subtotal)	**C**	**D**	**A**	**C**	**B**	**C**

Table 11. Management aspects: Award of marks

A3 comes out with the best results of this part of the evaluation as shown in Table 11. A5 is also assessed positive, but not to the extent of A3. A3 has more GSM occurrences in OECD-member countries than any other applicant, and A3 already has a strong presence in Ireland, covering both part of the cellular market and the billing and subscription experience to the mass market through one of its consortium members. Subsequently, A3 has been awarded an A.

A5 does not have the broad national and international GSM experience of A3, but still retains a growing foothold on the Irish fixed telecommunications market with the service provision related activities of Esat. In addition, Telenor is a recognised cellular operator, although a niche player in the international market. In addition, A5 seems to have a fully fledged organisation and management to undertake the GSM2 operations.

A1, A4 and A6 have also been assessed positively, but not to the extent of A3 and A5, since they have all some weaker points and not compensating stronger points. Among this group, A1 clearly has the strongest points.

A2 is the least satisfactory application in relation to management aspects. The degree of experience and preparedness is low, and the consortium has no practical GSM experience.

4.3.1 Experience of the applicant

The award of marks under this dimension is based on information which is identified in the applications. Most of the evaluation is based on qualitative information, although it has also been possible to compile some quantitative information.

A3 has considerable quantity of cellular experience with its principals being involved in four GSM1 networks and five other cellular networks in OECD member countries. A1 is similarly strong with its principals having a combined experience of 1 GSM2 network, 2 GSM1 networks and 3 other cellular networks. A6 has experience of two GSM2 networks and one other cellular network. A4 and A2 have no GSM experience but do have experience of other cellular networks. A5, however, has GSM1 experience in a competitive market.

This kind of experience has been taken into consideration, but in order to retain mainly a qualitative perspective on the evaluation of the experience dimension, the following 4 indicators have been defined: Experience and preparedness of the proposed management team, relevant experience of the applicant in the Irish market, sufficient experience of the applicant as a GSM operator in an European market and finally the mentioned quantitative experience of the applicant as a cellular operator in OECD member countries.

1. Management team[2]	C	E	B	C	A	D
2. Experience of Irish market	C	C	A	B	B	E
3. Experience of European market	A	D	A	C	A	A
4. Experience as cellular operator	B	E	A	D	C	B

Table 12. The award of marks concerning the dimension experience of the applicant

In the case of A2, the application does not provide information relevant to the indicator **experience and preparedness of the proposed management team** at all, which has lead to an E. A5 has conversely described the company structure in details and has allocated the key person to join the top level management of the operating entity. A number of the necessary constituents for success is present, and A5 has thus obtained the highest mark. A3 has described the composition of the management team in some detail, but the cellular experience among the top-level management is less hands-on than is the case of A5, and A3 has thus been awarded a B. Both A1 and A4 provide detailed account of the organisational structure and the division of responsibilities, but they have neither identified nor allocated named persons among the top level management. Consequently, they have both been awarded a C. A6, however, provides even fewer details and has accordingly been awarded one mark lower.

The experience of the applicant in the Irish market has also been evaluated as an indicator of experience in general. With Motorola, ESB and Sigma as the consortia members, A3 has a strong and relevant Irish market experience, both with cellular products and with the billing, subscriptions and customer care of the mass market. Consequently, A3 has been awarded an A. Both A4 and A5 have "operating" telecommunications experience in Ireland - A5 through Esat and A4 through AT&T and even more through the MMDS and cable operations of Princes Holdings. They have both been awarded a B, as the experience does not have the communality with cellular communications as is the case of A3. A1 and A2 have a similar degree of experience in the Irish market - A1 through the 3 individual members and A2 through the Irish members of the consortium. In both cases, the Irish market experience is not directly and relevantly mirrored in the applications, and thus a C has been awarded to both applicants. The application of A6 is the least satisfactory in relation to this indicator as A6 has no local representation presently, except for the potential consortium membership of CIE.

Another indicator is whether **sufficient experience of the applicant as a GSM operator** in a European market is present. This is clearly the case with A1, A3, A5 and A6, which have all gained As. A2 however, has no GSM experience and lacks operating presence in Europe, but because of the US experience with non-GSM cellular systems, A2 has been awarded the second-lowest mark (a D). A4 has been awarded a C, because through McCaw AT&T appears to have a broader base of experience. The possibility that A2, A4 and to an extent A6 may have some shortcomings in relation to European standardisation and the EU procurement rules

[2] Experience and preparedness of the proposed management team

Dimension: Experience of the applicant	A1	A2	A3	A4	A5	A6
1. Management team[2]	C	E	B	C	A	D
2. Experience of Irish market	C	C	A	B	B	E
3. Experience of European market	A	D	A	C	A	A
4. Experience as cellular operator	B	E	A	D	C	B
Experience of the applicant (subtotal)	**C**	**D**	**A**	**C**	**B**	**C**

[2] Experience and preparedness of the proposed management team