ODTR Radio Spectrum Management

- Planning for the Future

Response to the Consultation

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FOREWORD

Thank you to all those who responded to the consultation on "Radio Spectrum Management - Planning for the Future". My Office received nine detailed responses representing the views of current and potential spectrum users, consultants involved in advising spectrum users and international bodies representing specialist interests. The result is a broad range of comments and constructive viewpoints on the future requirements of spectrum users in Ireland and the role this Office must play in facilitating effective and efficient use of spectrum.

This paper summarises the issues presented, the responses received and the actions we are taking or considering. This consultation is part of a concerted approach to ensure that in the future Ireland has the necessary regulatory framework to maximise economic benefit from the radio spectrum, whilst protecting the needs of the wider community.

Many spectrum-using technologies and applications are changing or developing rapidly. As well as tracking key developments, we always welcome specific proposals from the industry or users of spectrum-based services.

Since our Consultation paper was issued, the ODTR has published the second edition of the Table of Frequency allocations for Ireland (ODTR document 01/23). It has responded publicly (ODTR document 01/07) to a review by the Department of Public Enterprise of legislation relating to the licensing and use of the radio spectrum. It has also issued a Consultation paper on its "Review of Licensing of Trunked On-Site and Local Area Business Radio in the 410-430 MHz Frequency Band" (ODTR document 01/25), and has issued a Report on its Consultation on Licensing Digital Terrestrial Television (ODTR document 01/17).

Etain Doyle

Director of Telecommunications Regulation

1 INTRODUCTION

This paper is the ODTR's response to the consultation based on our paper entitled "ODTR Radio Spectrum Management- Planning for the Future" (ODTR document 01/06 of February 2001).

The consultation paper resulted from a review of the market, economic, regulatory and technical factors likely to affect the use of radio spectrum in Ireland over the next ten years. The purpose of the review was to assist the ODTR in ensuring that Ireland has the necessary framework to maximise the benefit to the economy from the radio spectrum, whilst protecting the needs of the wider community.

Our aim in undertaking the review, the consultation, and the activities that will flow from them is to achieve a number of key objectives, including:

- maintaining efficient and effective use of radio spectrum in Ireland;
- assisting in creating further economic growth and social well-being across Ireland through spectrum use;
- providing a framework in which Irish consumers can get the best communications services in terms of price, quality and choice;
- enhancing Ireland's international competitiveness;
- ensuring consistency with the developing EU and wider international regulatory framework;
- reducing administrative burden.

The paper addressed two of the key market and technology developments currently affecting the use of radio spectrum in Ireland and internationally, namely:

- the increasing **convergence** between traditionally distinct sectors, such as fixed and mobile telephony, broadcasting and telecommunications, and information technology and communications;
- the increasingly rapid pace of **market and technology evolution**, as evidenced for example by the increasing ubiquity of the Internet and mobile communication devices, and the implications of this evolution for specific radiocommunication services and the future management of radio spectrum in Ireland.

The consultation also proposed the future publication of a Spectrum Strategy document and addressed a number of other specific issues related to spectrum management, including:

- the international role of the ODTR
- maintenance of an effective dialogue between the ODTR, industry and other interested parties
- likely areas of greatest spectrum demand
- how best to capitalise on Ireland's advantages in relation to use of spectrum
- dealing with spectrum congestion where it arises.

2 CONTENT OF THE PAPER

This document contains the following:

- each main theme discussed in the consultation paper is summarised;
- the views of respondents to the consultation questions are summarised; and
- where applicable, the actions the ODTR is taking, or the Director is considering, are presented.

3 LIST OF RESPONDENTS

The nine respondents to the consultation were:

- Connogue Ltd (Consultant)
- Crown Castle Ireland(Radio site operator)
- Esat Digifone (Network operator)
- Eircell (Network operator)
- eircom plc (Network operator) ESB (Utility)
- Mason Communications Ireland Ltd (Consultant)
- RTÉ (Broadcaster)
- Satellite Action Plan Regulatory Group (Industry group)

The Director wishes to express her thanks to everyone who contributed to the consultation. With the exception of material marked confidential, the written comments of respondents are available for inspection at the ODTR's office in Dublin.

A number of the responses focussed on the core business of the respondent. So, for example, some companies involved in mobile and fixed services did not comment on broadcasting issues and *vice versa*. Not all respondents replied to each and every question and a number felt it advantageous to respond in general to some issues and not detail a point by point analysis and response of each issue raised in the paper. As far as possible, all the issues raised have been considered in preparing this response.

4 MAIN THEMES

4.1 Future demand for radiocommunication services and spectrum (Question 1)

4.1.1 Summary of the Consultation Topic

The consultation document considered the potential future demand for broadcast, fixed, mobile, satellite and other radiocommunication applications under a number of hypothetical future scenarios, and the implications for spectrum management. Views were sought on the ODTR's analyses and in particular relating to future provision of Digital Audio Broadcasting (DAB) services in Ireland.

4.1.2 Views of Respondents

There was a broad consensus that demand for fixed service spectrum would increase, particularly for point-to-point links and mainly as a result of mobile operators rolling out 2.5G/3G mobile networks. One of the network operators who responded thought that demand for additional Fixed Wireless Access (FWA) spectrum may be more muted as indicated by the lack of demand in the second round competition for FWA licences, however another suggested that FWA could be used to provide mobile network infrastructure links to remote sites, complementing point-to-point links.

There was a similar consensus that there will be significant growth in demand for mobile services, with the exception of one respondent who thought the prospects for 3G may be overstated. All respondents agreed that "un-tethered" radio technologies, generally known as short-range devices (SRDs), such as Bluetooth, wireless local area networks (wireless LANs), and radio frequency identification (RFID)[1] will be increasingly important.

On DAB, the responses reflected a range of views from all respondents. The cost of DAB rollout was seen to be a significant issue for the broadcasting community, both for infrastructure and receivers – one respondent involved in broadcast transmission noted that in the UK it is only considered cost effective for a T-DAB transmitter to serve a population of 500,000 or more. Another respondent argued that receivers need to cost not much more than existing FM receivers.

The data capabilities of DAB were emphasised by one of the consultant respondents, suggesting this might even be comparable to 3G mobile in some instances, whilst a further respondent argued strongly for satellite DAB services to be considered, citing their particular suitability for countries like Ireland, with a relatively dispersed population. Other points raised by respondents in relation to DAB included:

- Ford's announcement that DAB receivers will be fitted to all of its cars in the UK from 2004 may be the impetus to get DAB receivers into mass production;
- DAB is not as flexible as FM in providing the local or regional services which are a significant part of the radio market in Ireland;
- At a planning conference which is scheduled for June 2002, the question of a further frequency block in L-Band (1467.5 – 1492 MHz) will arise for Ireland, which may be useful in this context.

4.1.3 Position of the Director

[1] RFID applications typically include tagging, building entry/exit control systems, barcode replacement systems, etc.

4.1.3.1 Fixed

The Office has continued to develop a licensing regime for fixed point to point links which is designed to meet the needs of industry whilst ensuring the optimum use of the frequency spectrum. Following a recent consultation[2], a new guidelines document (Document ODTR 98/14R) and a new application form (Document ODTR 98/15R) has been issued. In addition, the ODTR has implemented a sophisticated computer system to handle performance predictions, co-ordinate frequency assignments and ensure efficient use is made of the allocated frequency spectrum. The number of point-to-point link licences issued each year has continued to increase. As an illustration of this, at the end of April 2000 there were 2780 licensed links and at the same time this year there were 4407 licensed links. On-line electronic applications for fixed link frequency assignments and licences are expected to be available by the end of 2001.

Considering the current and projected demand for fixed service spectrum the majority of bands set aside have sufficient capacity in the medium term. Where congestion is anticipated in specific bands or at specific locations, consideration is being given to administrative pricing strategies to encourage the use of alternative media, frequency bands or technologies (see section 4.8).

Once 3G networks begin to roll out it is expected that there will be significant demand for fixed link frequency assignments, particularly in bands above 30 GHz, as infrastructure support for macro/micro/pico cell deployment.

Despite the lack of response to the FWA competition last year there appears to be an underlying demand for narrowband and broadband FWA applications. The Director is currently reviewing the situation and intends to announce her views on this matter shortly.

4.1.3.2 Mobile

A major development in mobile communications for Ireland will be the forthcoming introduction of third generation (3G) services. The Office expects shortly to issue the tender documents for 3G licences in Ireland. Licences will be awarded by means of a comparative selection or "beauty contest" process. Licences must be issued by the end of this year. The availability of 3G services will be essential to the continued development and attractiveness of Ireland's telecommunication infrastructure.

The Office continues to license traditional PMR services such as taxi and courier services. For the medium term the ODTR believes that there is adequate spectrum available in most areas to meet the predicted demand.

In 2000, the Office invited tenders for a national digital trunked radio licence but received no compliant applications. The Gardai and other emergency services are investigating the establishment of a national digital radio network for their specific requirements. This may stimulate growth and enhance the business case for the development of PAMR services. Meanwhile the ODTR has launched a consultation document, (ODTR Document 01/25). The purpose of this consultation is to gauge the demand for trunked private and public access mobile radio (PMR and PAMR) in the

[2] A review of Document 98/14 "Guidelines for Applicants for Point to Point Radio Link Licences in Spectrum Above 1 GHz." (ODTR00/69– September 2000) and response to consultation (ODTR 00/93)

410 - 430 MHz band, and to consult on the introduction of a consolidated licensing regime for trunked radio systems to cater for both PMR and PAMR applications. The introduction of new regulations are proposed to cover both trunked PMR and PAMR radio systems and to provide greater flexibility in the number of radio channels that may be assigned to trunked radio systems.

Market projections for Short Range Device (SRD) applications in Europe, e.g. from the Detailed Spectrum Investigation Phase III carried out by the European Radiocommunications Office, all indicate impressive growth trends as technologies mature, whether it be for alarm systems (> 10 million), Radio Frequency Identification devices (billions of tags and millions of readers), wireless audio (> 20 million), multimedia audio and video (> 18 million), or home & building electronic systems (>50 million). The ODTR is closely monitoring trends in Europe to support, where possible, harmonisation of frequency bands and equipment usage throughout Europe.

There is increasing interest in the use of untethered technologies to provide local access to public telecommunication services (e.g. short-range wireless internet connections). This is currently under consideration, and key issues will be dealt with in the Spectrum Strategy document referred to in 4.4.

4.1.3.3 Broadcasting:

Regulations are in place for key elements of broadcasting including analogue TV and radio, multipoint microwave distribution systems (MMDS) and deflectors.

Regarding Digital Terrestrial Television (DTT), following on the enactment of the Broadcasting Act 2001 the ODTR has published a paper outlining the licensing regime for national DTT (ODTR document 01/17). Regulations which will require the consent of the Minister for Public Enterprise are in preparation to enable the introduction of licensing for the operation of the six national multiplexes and for the operation of the national digital transmission network. The parties to whom these licences are to be issued are expected to be designated by the Minister for Arts, Heritage, Gaeltacht and the Islands in the Autumn of this year. The Office is currently considering its policy in relation to the deployment of DTT on a sub-national or regional basis and intends to issue a consultation paper on its proposals in June.

The current regulatory procedures in relation to independent sound broadcasting in Ireland tasks the Independent Radio and Television Commission (IRTC) with the role of granting sound broadcasting contracts subsequent to confirmation from the Director that frequencies are available. Prior to the coming on air of a new transmitter the Director adds the frequency assignment particulars to the IRTC licence. The Office continues to make frequency assignments available for new analogue FM services that are being licensed by the IRTC. Due to the demand experienced in Licence competitions, the Office expects to continue to do so in the foreseeable future. The Broadcasting Act 2001 expands the functions of the current IRTC to include programme content licensing on new digital platforms. As part of this process the IRTC will be renamed the Broadcasting Commission of Ireland (BCI).

It is not clear if DAB will be cost effective for local radio and may only be feasible when used for national and regional services. While local services could be carried on the multiplex established for national services, it is premature to consider the

possibility of closing down analogue sound broadcasting services and retrieving spectrum for other uses. As was stated in the consultation document, spectrum has been allocated in the upper part of VHF Band III for terrestrial BAB (T-DAB) in Ireland. The Director will continue to assess the demand for spectrum for T-DAB services in order to facilitate the timely development of such services in conjunction with the IRTC, and expects to issue an Information Notice in June 2001.

A number of Satellite DAB (S-DAB) services have been developed internationally and testing is underway on the use of hybrid satellite / terrestrial systems. However, to date initiatives to develop S-DAB or hybrid services have not met with significant market success.

Any transmitters operating on Irish territory require a wireless telegraphy licence from the ODTR and the radio station content must be regulated by the IRTC. For example, a satellite uplink which originates on Irish territory and/or a satellite network which is Irish based (i.e. Ireland was responsible for co-ordinating it) would require a wireless telegraphy licence from the ODTR whilst the programme content would be regulated by the IRTC.

The ODTR is actively participating in the CEPT Frequency Management Working Group (WGFM) and its Project Team (PT FM 24) which is working on Digital Video Broadcasting and PT FM 32 which is preparing for a T-DAB planning meeting which will focus on L-band.

The ODTR also participates in the National DAB forum, which includes representatives of the Department of Arts, Heritage, Gaeltacht and the Islands, the Department of Public Enterprise, the IRTC, RTE, Today FM and the Independent Broadcasters of Ireland.

4.2 Satellite service opportunities (Question 2)

4.2.1 Summary of Consultation Topic

The consultation document sought views on potential satellite service opportunities that might be appropriate for the Irish market in future.

4.2.2 Views of respondents

Responses on this issue were broadly split between supporters of satellite technology and those who viewed it less positively, reflecting the industry base of the various respondents. Satellite proponents were very positive about the prospects for satellite service delivery in Ireland, particularly with regard to S-DAB and satellite multimedia services. Ireland's dispersed rural population was cited as a factor favouring satellite provision. One of the network operators who responded suggested that satellites could support cellular infrastructure, e.g. by providing temporary base stations at special events. However a number of respondents not involved in the satellite sector felt that satellite delivery would be too expensive to compete effectively against terrestrial offerings.

Respondents indicated no difficulties with the current regimes, but one respondent identified a need to make spectrum available in the High Density Fixed Satellite Service (HDFSS) bands for future mass-market satellite services.

4.2.3 Position of the Director

The Office was one of the first three regulators in Europe to sign up to the CEPT One-Stop-Shopping initiative (OSS) for satellite licences and authorisations, the objective of which is to enable an applicant to file an application with a single point of contact (the OSS office) which in turn would circulate the application to all countries in which the applicant seeks a licence.

To date the ODTR has licensed approximately 200 VSAT terminals, the majority involving data transfer. The Director is keen to encourage the use of satellite technology, as it can offer a number of advantages especially for rural applications.

New regulations have recently been issued to facilitate the installation of large "teleport" installations in Ireland, with a view to encouraging further investment and development of Ireland's telecommunications infrastructure, (Wireless Telegraphy (Teleport facility) Regulations, 2001 (S.I. no.18 of 2001)).

The introduction of HDFSS services in Ireland would be likely to have implications for existing terrestrial network operators who currently operate a large number of customer access links in part of the spectrum identified for these services. Whilst there is some scope for the HDFSS and fixed services to co-exist, this requires careful evaluation, both of the technical issues involved and the likely future demand for both services. The Director has identified this as one of the issues to be raised in her proposed Spectrum Strategy document (see section 4.4).

4.3 International Priorities (Question 3)

4.3.1 Summary of Consultation topic

The ODTR needs to be aware of developments in technology affecting the use of the spectrum well in advance of such developments receiving spectrum allocations. This is accomplished through participation in the relevant international bodies, in particular the CEPT, the ITU and its World Radiocommunication Conferences and relevant committees of the EU. The consultation document sought views on the priorities that the ODTR should pursue internationally and whether there are other activities or developments that it should specifically address.

4.3.2 Views of respondents

There was general agreement with the priorities identified in the consultation document, although issues such as 3G, 4G (4^{th} Generation) mobile and EMC (electromagnetic compatibility) were also highlighted as issues to be dealt with.

4.3.3 Position of the Director

It is a priority within the Office that the interests of spectrum users are protected and that Ireland's interests as a whole are promoted and protected, to ensure the availability of appropriate spectrum to match the needs of the radio services. Three key priorities in this area for the current year are mobile frequencies, the new EC

Framework Directives and development of international relationships with other bodies.

The ODTR continues to monitor and review trends in Europe and actively participates in meetings concerning relevant services, working with Government and other agencies to influence the debate in Europe through active participation in CEPT, ITU, IRG and EU meetings where policies are developed and discussed.

Despite its small size, Ireland and the ODTR continue to play an important role in international spectrum management activities through participation in appropriate CEPT and ITU fora. For example ODTR staff currently chair the European Radiocommunications Committee (ERC) of CEPT, the Council of the European Radiocommunications Office, the presidency of the Independent Regulators Group (IRG), and chair the ERC project team (ERC/PT1), which is leading European preparations on 3G mobile communications (UMTS/IMT-2000) for the next World Radio Conference in 2003.

The Director intends to build on this established foundation of international activities and, recognising the resource implications, the ODTR will continue to focus on key themes of particular relevance to Ireland.

4.4 Spectrum Strategy Document (Question 4)

4.4.1 Summary of Consultation topic

The consultation sought views on a proposal to publish a Spectrum Strategy document and on what issues should be addressed by such a document.

4.4.2 Views of respondents

There was universal agreement with the proposal to develop a Spectrum Strategy Document, though views differed on the details of what it should address. Amongst the issues recommended for inclusion were:

- Addressing where possible, defence and national security use as well as civil / government use;
- Updates on spectrum activities, both national and international, which could also be included with the Regulator's quarterly report;
- Summary of usage trends, such as fixed link transmission capacity, which services or technologies are growing in importance, and who are the principal users of different parts of the spectrum;
- Early indications of developments in spectrum, in order to facilitate preparatory work by operators. An example of this would be the reservation of spectrum for future mobile use and possible implications this may have on existing spectrum usage;
- Strategies for the re-location of existing users, where it is deemed necessary to free up frequency bands for new services;
- Give advance notice of future ODTR consultations.

4.4.3 Position of the Director

The Director is encouraged by the strong consensus in support of the development of a Spectrum Strategy document. The consultation paper outlined the role this document would play.

Spectrum is an important resource in terms of the development of the telecommunications sector. Technological development will lead to new spectrum-using applications, and will also in coming years significantly increase the carrying capacity of spectrum, in effect making spectrum a more plentiful resource relative to demand. It is very important that spectrum continues to be made available for new applications and this will involve the retrieval and reissue of spectrum from time to time. The key consideration for the ODTR is ensuring the maximum benefit for Ireland, increasing competition and ensuring the provision of spectrum is governed with a view to innovation and competition rather than the protection of existing technologies or market positions.

The ODTR needs to be flexible and pro-active in facilitating the market to cope with technological developments and changes, and has been keeping under review developments in other countries. It notes that experience to date with spectrum trading in Australia and the USA has been disappointing, as it would appear that the commercial incentive to deprive others of the use of spectrum is more significant than any income to be gained from trading.

The Director intends to proceed with the development of a Spectrum Strategy document, with a view to launching a draft for consultation in September 2001. Consideration is being given to what the document should contain, but it is expected that it will include:

- the development of a broad regulatory strategy with a view to facilitating long-term planning by the ODTR and spectrum users in Ireland;
- a review of new technological and market developments, including significant R&D initiatives, to help spectrum users, the ODTR and other interested parties anticipate how spectrum use might evolve;
- brief analysis of new spectrum developments deemed to be of particular potential interest to Ireland, with a view to stimulating further analysis by spectrum users and others, and perhaps new spectrum-related economic activity;
- a summary of the ODTR's recent spectrum-related activities, to provide interested parties with a further opportunity to familiarise themselves with our work in this area.

4.5 Maintaining an effective dialogue (Question 5)

4.5.1 Summary of Consultation topic

The ODTR already engages in dialogue with spectrum users and other interested parties on specific aspects of spectrum use. The consultation sought views on how an active dialogue on spectrum strategy might best be maintained in the future.

4.5.2 Views of respondents

There was general agreement that an open forum would be the best way to achieve this, though views differed on the precise form it should take. Suggestions ranged from industry led committees, spectrum user fora or workshops, through to a "Standing Committee" chaired by the ODTR. Several respondents commented favourably on the value of the ODTR web site as a source of information.

4.5.3 Position of the Director

The ODTR already consults extensively and relies on consultation responses to address relevant issues in an effective and timely manner. The ODTR also makes extensive use of its website, press releases, meetings and newspaper advertisements, to inform the public of its activities and processes. It is however always looking for ways to maintain and improve dialogue with interested parties in an open and transparent manner.

The Director considers the publication of the Spectrum Strategy document as a good opportunity to further enhance dialogue and is considering holding a workshop in September to address the issues raised in the draft version, (see section 4.4). The appropriate format for such an event will be addressed as part of the process of developing the draft document.

4.6 Areas of greatest spectrum demand (Question 6)

4.6.1 Summary of Consultation topic

The consultation document sought views on where spectrum demand was likely to be greatest and, in particular, whether there was likely to be any significant change in spectrum demand for services or applications other than those mentioned in the document.

4.6.2 Views of respondents

There was broad agreement with the ODTR assessment, with individual respondents tending to focus on their own area of activity.

4.6.3 Position of the Director

The Director's position with regard to specific services is presented in section 4.1.

4.7 How to capitalise on Ireland's advantages (Question 7)

4.7.1 Summary of Consultation topic

The consultation document sought views on initiatives that might enable Ireland to capitalise on its comparative advantages in respect of spectrum-using technologies and services.

4.7.2 Views of respondents

There was a general feeling that there was scope to help foster innovation by minor modifications to the existing regime, e.g. by relaxing the test licence regime, rather than the introduction of radical changes.

4.7.3 Position of the Director

The Director is committed to providing an efficient and professional service to users of the radio spectrum. Processes are reviewed periodically to streamline procedures with a view to reducing administrative cost, burden and time taken to process applications.

The comparative absence of spectrum congestion, the high skill levels amongst the workforce, the existing strong ICT industry and Ireland's linguistic and geographic characteristics combine to make Ireland well placed to promote innovation in spectrum-using technologies and services. Indeed the strengths indicated above are ideal to encourage the research, development and testing of innovative new products. An ODTR team is currently examining options for encouraging the development of innovative radio-based services and applications and hence investment in Ireland. We intend to report on progress with this in the draft Spectrum Strategy document in September.

4.8 Dealing with Congestion (Question 8)

4.8.1 Summary of Consultation topic

The ODTR already uses administrative tools, such as link length policies for fixed links, to promote the most efficient use of spectrum. In other countries, spectrum managers are considering the use of a range of market mechanisms to provide users with incentives to use spectrum more efficiently and where appropriate to provide users with incentives to consider the use of alternative technologies or frequency bands.

The consultation document sought views on whether mechanisms to allow access to spectrum in congested areas should have regard to spectrum efficiency and alternative technologies.

4.8.2 Views of respondents

There was general agreement with incentives to use spectrum more efficiently in congested areas, including support for administrative pricing so long as this does not lead to excessive increases in the overall cost of using spectrum.

4.8.3 Position of the Director

A number of options are open to the Director when dealing with congestion, including:

- Ensuring that spectrum-efficient technology is utilised;
- Closing the affected bands or locations to prohibit further congestion;
- Allocating additional spectrum to the affected services;

- Migrating some users to other bands;
- Implementing administrative pricing to encourage more efficient use of the spectrum, (e.g. by encouraging spectrum users to consider alternative technologies such as fibre optics in appropriate cases).

Congestion is not a serious problem in most geographical areas in Ireland but where it does occur, administrative pricing is likely to provide an effective means of managing it. This would need to take regard of the availability of and demand for spectrum for the service in question and the desirability of promoting spectrum efficiency, economic benefits, innovation and competition. Pricing would also take into account factors such as congestion in specific bands or geographic areas and the degree of exclusivity of spectrum assignments. The Director considers it would be useful to prepare a paper and to seek views before proceeding further. This paper is expected to be issued by Autumn 2002.

5 CONCLUSIONS

The review and consultation have already stimulated constructive dialogue and helpful suggestions regarding the ODTR's approach to radio spectrum management, and how this can best meet the needs of the user community and contribute to Ireland's economic success.

Useful comments have been received in specific areas, such as fixed and mobile services, DAB, satellite communications and FWA, which will help the ODTR's deliberations in these areas. Similarly satellite systems may have a role to play in complementing terrestrial provision of telecommunications and broadcast services, but this raises issues of how to facilitate sharing with existing terrestrial services, particularly in the HDFSS bands.

While we will as indicated be consulting on these areas, we always welcome specific proposals from the industry or users of the services.

We were pleased to see the responses to the proposals in the consultation document, particularly the key proposal to develop a Spectrum Strategy document. We shall publish a draft of this in September 2001 and look forward to an ongoing dialogue with interested parties.