

International Best Practices Report on Telecommunications Regulations

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1	Introduction	5
2	Licensing Regulation	7
2.1	Key overarching components of a licensing framework.....	7
2.1.1	Liberalized licensing framework	7
2.1.2	Technology and service neutrality	7
2.1.3	Flexible licensing framework	7
2.2	Licensing application process.....	14
2.2.1	Standardized process	14
2.2.2	Application Requirements	16
2.2.3	Timeframes	16
2.3	License terms and conditions	17
2.3.1	Transparency.....	17
2.3.2	Standardization	17
2.4	License administration	20
2.4.1	Monitoring	20
2.4.2	Enforcement.....	20
2.4.3	Dispute Resolution.....	21
2.5	Timing of new license awards in Myanmar	22
3	Competition Regulations	23
3.1	General Principles of Competition Law and Regulation	23
3.2	Definition of the framework for analysis.....	24
3.3	Market definition	25
3.4	Dominance determination.....	27
3.4.1	Assessment of dominance	27
3.4.2	Collective dominance.....	29
3.5	Abuse of dominance	30
3.5.1	Prohibition of abuse of dominance.....	30
3.5.2	Justifications of conduct	31
3.6	Anticompetitive agreements	31
3.6.1	Prohibition of Anticompetitive agreements	31
3.6.2	Definition of “hard core” cartels and their standard of review	32
3.6.3	Leniency	33
3.7	Remedies.....	33

3.7.1	Ex post remedies.....	33
3.7.2	Ex ante remedies.....	34
3.8	Merger review.....	34
3.9	Relationship between the future general competition law and sector-specific competition regulation.....	35
4	Spectrum Regulation	36
4.1	Spectrum Allocation.....	36
4.1.1	Spectrum Availability	36
4.1.2	Harmonization.....	36
4.2	National Table of Frequency Allocations	37
4.3	Unlicensed/license-exempt spectrum	37
4.4	Spectrum Planning	37
4.4.1	Inventory of Current Spectrum Use.....	37
4.4.2	Develop a Spectrum Plan	38
4.5	Spectrum Assignments (Licensing)	38
4.5.1	Award Mechanism	38
4.5.2	Post-award spectrum transfers.....	39
4.5.3	License term.....	40
4.5.4	License renewal.....	40
4.5.5	Spectrum fees	41
4.5.6	Non-discrimination	41
4.5.7	Coverage Obligations.....	41
4.5.8	Technology Neutrality.....	42
4.5.9	Compliance.....	43
4.6	Technical Standards	43
4.6.1	Standards development.....	43
4.6.2	Equipment Certification	43
4.6.3	Radio Frequency (“RF”) Emissions Standards.....	44
4.6.4	Compliance.....	44
5	Interconnection and Access Regulations	45
5.1	Introduction to Two-way and One-way Access	45
5.2	Obligation to Interconnect.....	45
5.2.1	Mandatory interconnection.....	45
5.3	Additional Interconnection Obligations for Dominant Service Providers	47



5.3.1	Symmetric and asymmetric regulation.....	47
5.4	Access Obligations Beyond Voice Interconnection.....	49
5.4.1	Case-by-case analysis for access obligations	49
5.5	Dispute resolution, and timeframe for interconnection and access	51
5.5.1	Clear, timely procedures with independent review	51
6	Access Price Regulation	53
6.1	Introduction	53
6.2	Compensation under two-way access – “LRIC or lower”	53
6.3	Compensation under one-way access – Cost-orientated pricing	56
7	Numbering	58
7.1	Numbering Plan structure.....	59
7.1.1	New geographic numbers	59
7.1.2	Mobile numbers.....	59
7.1.3	Specially tariffed numbers	60
7.1.4	Carrier selection codes.....	61
7.2	Overall numbering plan structures	61
7.3	Numbering capacity	62
7.4	Strategies for expanding capacity.....	63
7.5	Managing the numbering plan.....	65
7.6	Numbering management best practice goals.....	67
7.7	Numbering for the benefit of users	67
7.8	Structure of numbering regulations	68
7.9	Number Portability	69
8	Public Consultation.....	71

1 Introduction

This report, prepared by the consulting firm, Telecommunications Management Group, Inc. (TMG), on behalf of the World Bank, identifies the best practices now in use around the world related to telecommunications regulation and public consultation. The analysis is based on an extensive review of the frameworks, approaches and regulations that have been adopted by other countries as they have sought to liberalize their telecommunications sectors, improve competition, and promote the more rapid introduction and adoption of advanced telecommunications technologies and services.

The goal of this report is to identify those approaches and regulations that have proven successful in helping other countries realize their sector and economic development goals, and that could be appropriately adapted to apply to Myanmar's specific situation.

Where possible, examples have been used from countries with similar levels of development, demographics, or geography, as is appropriate for each policy and regulatory area, keeping in mind their applicability to Myanmar's regulatory restructuring and the priorities and goals indicated by Ministry of Communications and Information Technology (MCIT or Ministry).

This analysis focuses specifically on the following areas:

- licensing;
- competition;
- spectrum regulation;
- interconnection;
- access;
- tariffing; and
- numbering.

These areas are the fundamental building blocks of any telecommunications regulatory framework. Government authorities responsible for the regulation of the sector have all had to address these issues when initially developing their regulatory frameworks. In doing so, they have confronted issues such as: what is the appropriate licensing framework; what terms and conditions should be imposed on licensees; what mechanisms should be incorporated into a regulatory framework to foster competition and promote a level playing field; how should the spectrum resources of the country be managed; what is needed to ensure telecommunications operators are able to obtain the necessary interconnection and access to offer their services; and what is necessary to develop numbering plan regulations? An important point to keep in mind is that these regulations are not static; they must be continually reviewed, updated, and modernized to respond to new technologies, services, and market developments.

In analyzing best practices for telecommunications regulation, there is a basic set of principles that have been adopted at the international level that must be considered. In 1997, as part of the World Trade Organization (WTO) negotiations on the Agreement on Basic Telecommunications (ABT), many countries agreed to adhere to a series of telecommunications regulatory principles, or best practices, outlined in a

WTO-prepared Reference Paper.¹ The WTO Reference Paper was conceived as a necessary instrument for the removal of regulatory barriers to market access, and its implementation is aimed at preventing anticompetitive practices by major suppliers and opening the local telecommunications markets to new entrants.² Today, the WTO Reference Paper is viewed as a good starting point for consideration of the key issues necessary for developing sound telecommunications regulatory policy.

The Reference Paper contains the key regulatory policy principles that member countries must adhere to. For the purposes of this report, the relevant principles include:

- 1) preventing domestic telecommunication providers from engaging in anticompetitive practices;
- 2) providing interconnection upon request, under non-discriminatory terms and conditions, and at cost-orientated rates that are transparent and feasible;
- 3) making licensing criteria transparent and publicly available, including the time it will take to reach a decision on a license application; and
- 4) making fair and non-discriminatory use of scarce resources, such as spectrum.

Although Myanmar has not committed formally to the Reference Paper, it is clear from the draft Telecommunications Law that these principles are consistent with the approach the Government is taking with respect to telecommunications regulation. The WTO principles also represent the best practices adopted in the region as most ASEAN countries have committed to the Reference Paper, except Cambodia, Laos, and Vietnam.³ Our analysis indicates that the WTO principles, coupled with the specific best practices identified below, represent the most advanced thinking on how best to approach regulation of the telecommunications sector in today's competitive world.

In highlighting international best practices, the goal is not to imply that there is only one course of action that a government must follow in developing policies and regulations or one set of specific provisions that should be adopted. Experience has demonstrated that wholesale adoption of another country's regulatory framework is generally ill-advised given that each country has particular attributes and considerations that impact the design of their regulatory framework. Nevertheless, the experiences of other countries, and the widespread adoption of the WTO Reference Paper principles, are useful to demonstrate what has been shown to work in other countries. By adopting an approach that encompasses widely tested and accepted best practices, the Government of the Republic of the Union of Myanmar will maximize its ability to achieve its goals in a timely fashion.

¹ Originally, 55 countries signed on the WTO Reference Paper, but that number has now increased to 98. See http://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm.

² See <http://www.ictregulationtoolkit.org/en/section.1651.html>.

³ WTO, Telecommunications services: list of commitments and exemptions, http://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_commit_exempt_list_e.htm.

2 Licensing Regulation

The licensing framework for the establishment and provision of telecommunications networks and services serves as the foundation for the telecommunications sector. The underpinnings of the framework are typically grounded on a range of legal instruments, particularly the telecommunications law and its implementing regulations, guidelines and policies, as well as the licenses themselves. The telecommunications law typically provides a basic outline of the licensing framework, including specifying the regulator's authority in approving and administering licenses. The regulations generally build on the law by detailing the license categories, providing measures for issuing, modifying, and terminating licenses, as well as specifying the license rights, obligations, and fees, including references to obligations prescribed in complementary regulations. For example, the license regulation generally references the use of spectrum (particularly where the spectrum authorization is separate from the network/service license, as is planned in Myanmar), and addresses potential further obligations relating to specific rules on operators with market power, interconnection and access, numbering and/or universal service. As such, license regulations are subordinate to the telecommunications law and directly linked to other rights and obligations in complementary regulations.

The following sections draw on experiences from other countries to highlight provisions to be considered when drafting and implementing the license regulation. Beginning with a high-level focus on the adoption of a liberalized and technology-neutral framework, the license regulation should include transparent and standardized licensing application processes, non-discriminatory license terms and conditions, and provisions to promote effective and efficient license administration.

2.1 Key overarching components of a licensing framework

As addressed below, a liberalized and unified licensing framework are hallmarks of a licensing regime aligned with current international best practices. Key elements of such a framework include technology and service neutrality, as well as rules that afford regulatory certainty while remaining flexible enough to accommodate the dynamic telecommunications market.

2.1.1 Liberalized licensing framework

A liberalized framework allows the telecommunications sector to transition from a monopoly to a thriving, competitive market by facilitating new entry; thereby improving service quality and selection, reducing prices and increasing access to new and innovative services.

2.1.2 Technology and service neutrality

Incorporating technology-neutrality into a licensing framework allows operators to choose which type(s) of technology to deploy and use, while a service-neutral framework enables operators to offer any type of service to end users. Technology and service neutrality involves moving away from service-specific licenses in which an operator must hold a separate license for each type of network and/or service it offers. Today, most countries provide for technology neutrality and many countries also allow service neutrality.

2.1.3 Flexible licensing framework

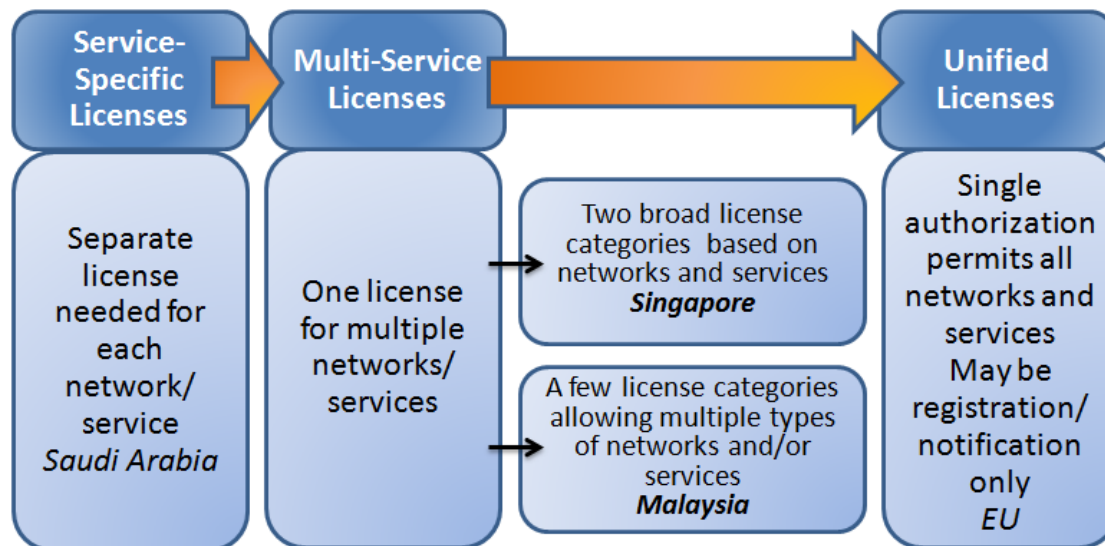
Alongside the introduction of technology and service neutrality, regulators are streamlining their licensing frameworks and allowing for unified licensing which permits operators to offer all services – or at least a broad range of services – under a single license.

Unified (or integrated) licensing both simplifies the licensing process to promote new entry and competition, as well as enables existing operators to more easily expand their service offerings by eliminating the need to obtain a new license for each new service added to the network, which significantly delays the roll-out of new and innovative technologies and services.

2.1.3.1 Multi-service telecommunications licensing approach

As shown in Figure 1, a multi-service licensing approach provides an intermediate step between service-specific licensing and a fully unified licensing regime or general authorization. Unlike with a service-specific regime, a multi-service licensing framework allows providers to offer multiple services under the umbrella of a single authorization, using any type of communications infrastructure and technology capable of delivering the services in question. As such, multi-service licenses are technology- and service-neutral within the designated set of authorized services. However, a multi-service approach is not as streamlined as the general authorization framework, which provides the greatest ease of entry, is fully technology- and service-neutral and is often subject to simple registration or notification processes. For example, Member States of the European Union transitioned from service-specific licensing regimes to a general authorization regime in 2002.⁴ Member States were required to amend their laws to facilitate entry and innovation through the least onerous authorization system possible. This was seen to be best achieved by general authorization of all types of electronic communications networks and services without requiring prior permission from the regulator – procedural requirements are registration/notification only.

Figure 1: From Service-Specific to Unified Licenses



Note: In this context, “license” refers to the regulatory authorization needed to provide telecommunications networks and/or services.

Source: TMG, Inc.

Multi-service licensing frameworks can be established in several ways. The framework adopted in Singapore, for example, represents a highly streamlined multi-service licensing regime in which there are two main categories of licenses – facilities-based and services-based.

⁴ EU, Common regulatory framework for electronic communications networks and services (Framework Directive) of 2002, 2002, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0033:0033:EN:PDF>.



Pursuant to Singapore’s Telecommunications Act (Cap. 323), the Infocommunications Development Authority (“IDA”) adopted a simplified telecommunications licensing framework based on whether an applicant seeks to provide facilities-based operations (FBO) or services-based operations (SBO).⁵ The framework is hierarchical so that licensees hold only one type of license (i.e., FBO license allows the provision of all networks and services, while SBO is limited to service provision only). Licenses are technology-neutral within their respective categories.⁶

An FBO license is required to build, maintain, and/or operate telecommunications network infrastructure or facilities for the purpose of providing telecommunications services to third parties. The types of facilities include base stations and towers for mobile networks, as well as switches, ducts, and cable systems for fixed line networks. An SBO license is required to lease telecommunications network elements, such as transmission capacity and switching services. The SBO licensee may resell this leased capacity to other licensed operators or provide telecommunications services to end users. As shown in Table 1 below, there are two sub-categories of the SBO license: Individual and Class. The distinction between SBO (Individual) and SBO (Class) licensing is whether international services are provided (i.e., class licensing permits domestic traffic only).

Table 1: Overview of Singapore’s licensing framework

	FBO	SBO
Individual	Construct, maintain, and/or operate telecommunications network infrastructure for the purpose of providing telecommunications services to third parties.	Provide services to third parties by leasing capacity from FBO or other SBO (Individual) licensees. Required to lease international transmission capacity and is subject to an application and approval process. Examples of permitted services are international simple resale, resale of leased circuits, public Internet access services and Internet exchange services
Class	None.	Subject only to registration with the IDA rather than an application approval process. Examples of the services permitted under the SBO (Class) license are Internet-based voice and data services

Source: IDA, *Guidelines on Submission of Application for a Facilities-Based Operator Licence*.

Jordan has also implemented significant reforms to liberalize the telecommunications sector, including licensing reforms initiated in 2005. At that time, the Telecommunications Regulatory Commission (TRC) of Jordan established its current *Integrated Regime of Licensing and Regulation* (“Integrated Regime”) that sets out two license categories for telecommunications – Individual and Class – based on whether access to scarce resources is required, including spectrum and public rights-of-way (see Table 2).⁷

⁵ Telecommunications Act (Cap 323), 2000, <http://www.ida.gov.sg/Policies-and-Regulations/Acts-and-Regulations>.

⁶ IDA, *Guidelines on Submission of Application for a Facilities-Based Operator Licence*, <http://www.ida.gov.sg/~media/Files/PCDG/Licensees/Licensing/Framework%20and%20Guidelines/GuidelinesLicensingSch/FBOGuidelines.pdf>.

⁷ TRC, *Information Memorandum Related to a Program of Licensing within the Fixed Telecommunications*, 2004, http://www.trc.gov.jo/images/stories/pdf/Infomem_Final-%207-12-2004.pdf?lang=english.

Notably, the TRC specifically exempts several types of scarce resources from the individual licensing requirement. These include spectrum used for VSAT services and spectrum used on a secondary or non-interference basis (such as is typically used for Wi-Fi). Overall, the framework is highly simplified and provides a streamlined process for licensing of telecommunications networks and services in Jordan.

Table 2: Overview of Jordan’s licensing framework

Individual	Class
Required to provide public telecommunications services and/or operate public telecommunications networks requiring scarce resources that have not been specifically exempted by the TRC from an Individual License requirement.	Required to provide public telecommunications services and/or operate public telecommunications networks (i) not requiring the use of scarce resources or (ii) requiring the use of scarce resources that have been specifically exempted by the TRC from an Individual License requirement.

Source: TRC, Information Memorandum Related to a Program of Licensing within the Fixed Telecommunications, 2004.

The Electronic Communications Act in South Africa also liberalized and streamlined the previous service-specific licensing framework by creating two main license categories – Electronic Communications Network Service (ECNS) and Electronic Communications Services (ECS).⁸ ECNS is a facilities-based license that permits the licensee to build, operate, and maintain the network infrastructure. ECS is a services-based license that allows the licensee to use capacity leased from an ECNS licensee to provide electronic communications services to third parties, including end users. ECS licensees do not own or operate the underlying infrastructure and would include ISPs.

The framework is technology-neutral whereby an ECNS licensee is permitted to deploy any type of fixed line or mobile network technology. Spectrum authorizations are assigned separately, and an ECNS licensee must also obtain an ECS license in order to offer services over its network infrastructure (and is therefore not hierarchical as in Singapore). ECNS and ECS licenses are each divided into Individual and Class licenses, as set out below:

Table 3: Overview of South Africa’s licensing framework

	ECNS	ECS
Individual	Construct, operate, and maintain network on a nationwide basis.	Provide services by leasing capacity from ECNS licensee (i.e., prohibited from constructing, operating or maintaining network infrastructure). May provide voice/VoIP (including access to numbering), Internet access, and value-added services.
Class	Construct, operate, and maintain network within a district or local municipality. Subject to simple registration process rather	All services may be provided, except for those requiring numbers from the national numbering plan. However, a Class ECS licensee may enter into a commercial

⁸ Electronic Communications Act, 2005, No. 36 of 2005, <https://www.icasa.org.za/Portals/0/Acts/Electronic%20Communications%20Act/Electronic%20Communications%20Act,%202005.pdf>.

	ECNS	ECS
	than more stringent application process.	agreement with an Individual ECS licensee to obtain numbers. Subject to simple registration process rather than more stringent application process.

Source: *Electronic Communications Act, 2005, No. 36 of 2005.*

In many countries, there has also been a trend to decrease the number of license categories. For example, prior to the enactment of the Malaysia Communications and Multimedia Act 1998 (CMA), there were 31 different telecommunications licenses under the previous service-specific regime.⁹ Malaysia’s model currently has four license categories divided into Individual and Class licenses, as set out below.¹⁰ The reduction of license categories makes the framework more efficient than the previous service-specific regime containing 31 separate licenses. However, the framework is not hierarchical – a provider holding an NFP license must obtain the other licenses in order to offer those services. This makes the model not as streamlined as in certain other countries.

Table 4: Overview of Malaysia’s licensing framework

	Network Facilities Provider	Network Service Provider	Application Service Provider	Content Application Service Provider
Individual	Own and operate network facilities infrastructure such as cables, towers, satellite earth stations, broadband fiber optic cables, and telecom lines and exchanges.	Provide services over networks. NSPs are generally NFPs, although they may opt to just lease and resell capacity from NFPs.	No individual license – class licensed and exempt/unlicensed only.	Deliver television and radio broadcast services, as well as pay TV services.
Class	Limited purpose network facilities only.	Niched customer access and niched connection services.	Functions delivered to end users, such as voice services, data services, and Internet access.	Content targeted to specific groups, such as for distance learning or sporting events.
Exempt/Unlicensed	Broadcasting and production studios; incidental network facilities; and private network facilities.	LAN services and private network services.	Electronic transaction service; interactive transaction service; networked advertising boards	Internet content is explicitly exempt from any licensing obligations.

⁹ infoDev, Simplification of Authorizations, Practice Note, ICT Regulation Toolkit, <http://www.ictregulationtoolkit.org/en/PracticeNote.aspx?id=3121>.

¹⁰ MCMC, Licence Application Procedure and Licensing Criteria, <http://www.skmm.gov.my/skmmgovmy/files/attachments/LicensingGuideBook.pdf>.



	Network Facilities Provider	Network Service Provider	Application Service Provider	Content Application Service Provider
			and Cineplex; or web hosting or client server.	

Source: MCMC, Licence Application Procedure and Licensing Criteria.

2.1.3.2 Treatment of content licensing and regulation

Notably, it is critical that the licensing framework does not extend the regulator’s authority beyond its jurisdictional responsibilities. For example, it is explicitly within the jurisdictional authority of a multimedia regulator, such as Malaysia’s, to issue and administer telecommunications licenses and content licenses associated with television and radio broadcasting. However, in countries with separate entities responsible for regulating telecommunications and content, such as in Singapore, it is generally not within the telecommunications regulator’s jurisdictional authority to issue and administer content licenses. In Singapore, the IDA regulates telecommunications while the Media Development Authority (“MDA”) regulates content.

Under Myanmar’s current laws, the MCIT is not responsible for the licensing of content, which falls within the jurisdiction of other ministries. The most recent version of the Draft Telecommunications Law (which has been submitted to the legislature) would permit the MCIT to issue rules and regulations on the provision of content,¹¹ provided that (i) the Union Government has approved such rules and (ii) the rules are subject to public consultation.¹² If content regulation provisions are included in the enacted Telecommunications Law, then the MCIT should coordinate with the Ministry of Information and other governmental bodies responsible for content regulation prior to issuing such rules.

It is also important to recognize the issues that can arise when requiring content licenses along with licenses for telecommunications networks and services. In particular, the processes for licensing telecommunications networks and services should be transparent, objective, neutral, and as free from politicization as possible. In contrast, the regulation and licensing of content are political functions. Combining content licensing with telecommunications licensing can undermine the objectivity, transparency, and neutrality of the MCIT’s regulatory functions.

Finally, it is important to note that where content is regulated to some degree, content licensing does not generally extend to Internet content, but to television broadcasting, radio broadcasting, and pay TV services. For example, both Malaysia and Singapore exempt Internet content and applications from licensing obligations and instead have adopted general codes of conduct for Internet content. In Malaysia, the multimedia regulator administers the code while the MDA administers the code in Singapore, in line with its jurisdictional authority (see Box 1).

¹¹ The Draft Telecommunications Law broadly defines content as meaning “text, sound, still or moving picture , or other audio-visual representation, tactile representation, or any combination of the preceding which can be created, manipulated, stored, retrieved, or communicated electronically.”

¹² See Draft Telecommunications Law (17 March 2013), Chapter 4, Article 11.

Box 1. Internet Code of Practice in Singapore

In Singapore, the Internet Code of Practice¹³ is intended only “to limit public access to some high-impact illegal sites as a statement of Singapore’s social values.”¹⁴ The Code of Practice applies to Internet Service Providers (ISPs) and certain website content providers called Internet Content Providers (ICPs). Importantly, Internet content is not pre-censored and ISPs are not required to monitor the Internet. ICPs include business websites and websites for religious or political purposes, but do not include personal websites, news wire services, and software developers. The obligations on entities subject to the Code of Practice are minimal. They must exercise judgment regarding content posted on the Internet and are generally considered to be in compliance with the Code of Practice when they deny access to prohibited material, as directed by the MDA.¹⁵ The types of content that the MDA prohibits are narrow in scope—pornography and material to incite racial or religious hatred. The MDA explicitly takes a light-touch regulatory approach, including in relation to enforcement. For example, an ISP or ICP found to breach the Code of Practice is afforded the opportunity to remedy the breach prior to the MDA taking any enforcement action. Mechanisms also are in place for content providers to dispute that certain materials should be prohibited.

2.1.3.3 Licensing framework trends

Regardless of the specific model adopted, the trend towards liberalized and technology-neutral licensing frameworks began decades ago, with many countries around the world having now adopted some degree of unified licensing, such as all EU Member States, Canada, Jordan, Kenya, Korea (Rep.), Nigeria, Thailand, Uganda and the United States, in addition to Singapore, South Africa and Malaysia.

While the precise mechanism that is implemented varies from country to country, there is a general trend in developing licensing frameworks that follow most, if not all, of the elements described below:

- The more unified the framework, the greater the ease of entry and deployment of new and innovative services. As such, the simplest licensing framework should be adopted, to the extent permitted by law. Unified frameworks still generally require separate authorizations for the use of scarce resources, particularly access to spectrum.
- There should be a clear explanation of how – and to what extent – the licensing framework is technology-neutral and facilitates new market entry.
- There should be no pre-determined cap on the number of licensees in order to facilitate market entry. Referred to as “open entry,” any applicant that satisfies the application criteria should be granted a service/operating license. However, the grant of a service/operating license does not guarantee access to scarce resources, such as spectrum, which are generally obtained through a competitive bidding mechanism.

¹³ MDA, Internet Code of Practice, http://www.mda.gov.sg/Documents/PDF/licences/mobi.981.Internet_Code_of_Practice.pdf.

¹⁴ MDA, Internet regulatory framework: FAQs, http://www.ifaq.gov.sg/mda/apps/fcd_faqmain.aspx.

¹⁵ MDA, Internet Industry Guidelines, http://www.mda.gov.sg/Documents/PDF/Policies/PoliciesandContentGuidelines_Internet_InternetIndustryGuidelines1.pdf.

- Any grant of exclusivity or limitation on the number of licenses issued should be well-reasoned and of limited duration.
- Differentiation between license categories should be clearly defined and based on objective factors, such as a facilities-based/services-based distinction or a distinction based on whether access to scarce resources is needed.
- Where there is differentiation between individual and class licenses, the framework should be hierarchical (i.e., the individual license allows the licensee to offer each type of service specified in both the individual and class licenses).
- In transitioning to a more unified licensing regime, existing service-specific licenses should be examined to determine whether, based on current objectives, such services should still be licensed separately or as part of a unified regime, be subject to registration/notification only, or be exempt from licensing.

2.2 Licensing application process

In addition to a more simplified licensing framework, the processes for granting licenses and authorizations should be published, streamlined and standardized, in line with the WTO Reference Paper (which requires publication of licensing criteria, the period of time to issue a decision on license applications and the reasons for denial).¹⁶ This includes publishing a standard application with instructions for completing and submitting the application.

2.2.1 Standardized process

A standard application means that all applicants for a certain license category use the same application with the same information requirements, unless there is an objective reason for differentiation, in order to ensure parity and transparency. In Jordan, for example, the government introduced an Integrated Regime as part of the liberalization of the telecommunication sector, promoting competition through open entry, minimal regulatory intervention, and standardized processes, including licensing application procedures. The Jordanian telecommunications regulator, recognized the “need for an objective and transparent application and qualification process” to allow it to objectively decide whether applicants meet the specific legal, financial, technical and administrative requirements for the application they are submitting and, if necessary, whether they are qualified to make appropriate use of scarce resources. The regime does not seek to determine whether a potential entrant will be successful or unsuccessful in the market.¹⁷

The Instructions contain the submission requirements and evaluation criteria for both individual and class licenses, and are applied equally to each applicant. An application must be completed for either an individual or a class license (licenses are hierarchical, so only a single license may be held). The application forms are also included as annexes to the Instructions, with all potential and existing licensees held to the same requirements. The applications are “fill-in-the-box” and the questions are

¹⁶ World Trade Organization, Telecommunications Services: Reference Paper, 24 April 1996, http://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm.

¹⁷ The application process was detailed in the *Instructions regarding the Application Procedures and Criteria for the Award of Public Telecommunications Individual and Class Licenses* (“Instructions”). TRC, *Instructions Regarding the Application Procedures and Criteria for the Award of Public Telecommunications Individual and Class Licenses*, 2008, http://www.trc.gov.jo/images/stories/pdf/licensing_instructions_en.pdf?lang=english.

concise to make them clear and simple to complete, and include a checklist for all of the supporting documentation to be submitted with the application.

Similarly, in 2007, the Economic Community of West African States (“ECOWAS”), seeking to streamline its application process, issued the *Legal Regime Applicable to Network Operators and Service Providers*. This requires Member States, when intending to grant individual licenses, to “grant the licenses according to open, non-discriminatory and transparent procedures, and, for this purpose, all candidates shall be subject to the same procedures unless there is an objective reason for subjecting them to different treatment.”¹⁸

Tanzania provides another example of a relatively simplified application process through the use of a “check-the-box” application. In 2005, the Tanzania Communications Regulatory Authority (“TCRA”) introduced a converged licensing framework as part of the process to end the state-owned operator’s monopoly in the telecommunications sector and liberalize the market.¹⁹ As a converged regulator with jurisdictional authority over both telecommunications and broadcasting/content, TCRA established four main license categories similar to those adopted in Malaysia – Network Facilities, Network Service, Applications Service, and Content Services.

All four licenses use the same “check-the-box” application that, at just three pages long, is concise while ensuring that the TCRA receives all of the information necessary to make an informed decision.²⁰ See Box 2 for an overview of the information required in the license application. Notably, some distinction in the treatment of individual and class licensees may be preferred. For example, it is often not necessary for class license applicants to submit a business plan with technical specifications and network rollout.

Box 2: Overview of Tanzania’s Application for Network and Service Licenses

The first part of the application is in a checklist format identifying the set of documents that the applicant must attach when submitting the application, including:

- Certified copies of certificate of Incorporation or Registration and the Company’s Memorandum of Association
- Business plan containing: technical specifications, network rollout plan and configurations, services to be offered and prices, customer care strategies, projected financial statements, etc.

The applicant must identify the type of license(s) for which it is applying and answer 14 questions (the last of which is a declaration that the information provided is accurate), including:

- Name and contact information
- Share capital
- Citizenship of shareholders/directors

¹⁸ ECOWAS, Supplementary Act A/SA.3/01/07 on the Legal Regime Applicable to Network Operators and Service Providers, 2007, http://www.ecowas.int/publications/en/actes_add_telecoms/ICT_Policy_ECOWAS_Engl.pdf.

¹⁹ TCRA, Guidelines and Procedures for Licensing Electronic and Postal Communications in Tanzania, January 2005, <http://www.tcra.go.tz/images/documents/licensing%20information/ANNEX%2013%20-%20LICENSING%20GUIDELINES.pdf>.

²⁰ TCRA, Application for a Licence to Provide Communications Networks and Services, <http://www.tcra.go.tz/images/documents/licensing%20information/application-forms/ApplicationFormFSA-CLF.pdf>.

- Intended area to be covered (national, regional or district)
- Estimated cost of investment
- Intention to use spectrum resources (if yes, provide the network diagram)
- Present and future staff members and qualifications
- Staff training programs (if any)
- Expected date of commencement of operations
- Future plans
- Any other relevant information

Source: TCRA, *Application for a Licence to Provide Communications Networks and Services*.

2.2.2 Application Requirements

The amount and type of information to be provided by applicants should be proportionate to the type of license sought. For example, proof of financial or technical expertise is generally not warranted for class licenses, whereas a facilities-based individual license would likely require the applicant to demonstrate financial and technical capabilities. Extensive administrative procedures are costly to both applicants and the regulator, requiring more resources and longer timeframes.

In Jordan, both individual and class license applications require demonstrating a satisfactory level of financial, managerial and technical experience, although class applicants are held to a lower standard (such as not being required to submit a business plan).

2.2.3 Timeframes

License processes should also promote efficiency by including timeframes for the regulator to make a decision and requirements for the regulator to provide written reasons for refusing to grant a license. In Jordan, the timeframe for evaluating a completed individual license application is 40 working days and 30 working days for a class license application, with an additional 15-day public comment period for both. The Instructions set forth the possible reasons for rejection of an application, such as prior non-compliance with the telecommunications laws and regulations, failure to pay previous fees or lack of financial or technical capabilities. Any rejection must be provided to the applicant in writing with the reasons for rejection clearly stated. The TRC publishes all approved licenses. Member States in ECOWAS must also “inform the applicant of its decision as soon as possible, and at the latest six weeks following receipt of request.”²¹

Overall, best practices in the license application process include:

- Establish objective, non-discriminatory application processes that enable the regulator to decide whether to grant an application.
- For transparency and ease-of-entry purposes, make all licensing criteria publicly available, preferably on the regulator’s website.
- For class licenses, use a simple registration form, or even just a notification process that does not require prior regulatory approval for the provider to begin offering services.

²¹ *Id.*

- For individual licenses, permit applicants to apply for the full range of activities within a particular license category in the same application. For example, the license application may include a “check the box” list or allow the applicant to identify the types of facilities and/or services it seeks to offer. Tanzania, as described in more detail below, uses a “check-the-box” application used for the four main license categories that, at just three pages long, is concise while ensuring that the TCRA receives all of the information necessary to make an informed decision.
- Where licenses are subject to open entry (i.e., no limit on the number of licensees), applications should be granted provided the applicant satisfies the relevant application criteria.
- When existing licensees seek to expand their activities within the same license category (for example, if a fixed line operator wants to offer mobile services), the procedures should involve a notification or simplified application process (in addition to any spectrum-specific licensing requirements).
- Set a timeframe for the regulatory authority to issue a decision on license applications, and require the regulator to provide a written, reasoned response in cases where a license application is denied.

2.3 License terms and conditions

2.3.1 Transparency

As noted in the *infoDev* ICT Regulation Toolkit, there is “no standard set of conditions for unified or multi-service authorizations. The conditions attached to these authorizations vary from one country to another as they are the products of the individual circumstances and the regulatory framework in each country.”²² However, there are general principles that license terms and conditions should follow. In particular, the WTO Reference Paper requires license terms and conditions to be made publicly available to promote transparency. The publication of license terms and conditions is essential for ensuring transparency, as well as for monitoring competition. Transparency is the key to providing regulatory certainty that encourages compliance with rules and regulations and minimizes the need for regulatory intervention.

2.3.2 Standardization

While transparency is essential, other aspects that create an effective framework in line with best practices include license conditions that are reasonable, proportionate to the type of networks/services to be offered, non-discriminatory (i.e., applied equally to similarly situated licensees) and cost-effective for both the provider and the regulator. Many countries achieve these best practices by including the bulk of (or even all) license conditions and terms within the licensing regulations themselves and/or creating a license template that requires simply filling in the licensee’s information and date of award. This is practiced in the United States, Singapore and throughout Europe.

²² *infoDev*, ICT Regulation Toolkit, Module 3, <http://www.ictregulationtoolkit.org/en/Section.3329.html>.

Box 3: HIPCAR Model Licensing Guidelines

In 2008, the International Telecommunication Union (“ITU”) and the European Commission (“EC”) joined with the Caribbean Telecommunications Union (“CTU”) and Caribbean Community (“CARICOM”) to launch an initiative on Harmonization of ICT Policies, Legislation, and Regulatory Procedures in the Caribbean (“HIPCAR”). One of the key outputs of this initiative was the publication of Licensing: Model Policy Guidelines and Legislative Text (“Model Licensing”). The Model Licensing texts were developed over a two-year period with the assistance of ITU consultants and were reviewed, finalized and adopted by CARICOM Member States in two consultation workshops in 2009 and 2010. As such, the guidelines and model legal text provide key elements of best practices for licensing regulations, including technology-neutral rules, simplified licensing processes, uniform license conditions, and transparent license administration.

The Model Licensing documents are based on a two-tiered, hierarchical, multi-service licensing framework based on individual license and class license categories. The HIPCAR texts can therefore benefit the licensing regulations developed by the MCIT, as Myanmar also moves towards a multi-service licensing framework and competitive telecommunications market. The following outlines several of the best practices cited in the Model Licensing Guidelines while an outline of the relevant portions of the Model Licensing Legislative Text is set out in Annex A: HIPCAR Outline of Model Legislative Text – Licensing (Parts I-III).

- The detail of the legal and regulatory text is not copied verbatim in the licenses – i.e., the licenses refer to the relevant legal provisions without copying text of regulations.
- License conditions are justified, proportionate, non-discriminatory, cost efficient and transparent.
- The objective is that costs imposed on licensees should be transparent and proportionate in relation to the cost of regulating the sector.
- The legal framework reflects a gradation of rights and obligations according to the specific situation (e.g., obligations just applicable for dominant operators/operators with significant market power, specific obligations linked to use of numbers or spectrum).
- There is provision in the licenses to allow an operator to apply to the regulator for forbearance from regulation. Where such forbearance has been granted, the determination shall be clear and published.
- Over time a build-up of dated regulation has the potential to hinder sector development. Licensing objectives are to minimize the regulatory burden imposed on licensees.
- The regulator should provide for license conditions to be reviewed periodically and if necessary removed or modified.
- Procedures to amend a license must be transparent.
- Timeframes required for modifications to a license must be reasonable.
- The license must provide for termination rights and renewal that are appropriate to each party.

Source: ITU, Licensing: Model Policy Guidelines and Legislative Text, 2010.

Part of achieving standardized licenses is to ensure that all similarly situated operators have substantially similar licenses, and are therefore subject to the same license terms and conditions. This helps to ensure that licensees are treated in a non-discriminatory, transparent, and objective manner by the regulatory authority.

While license conditions should generally be uniform, the framework should also allow for a gradation of rights and obligations, based on market realities. For example, while conditions should generally be standardized and applied equally to all licensees, the licensing process should also be able to account for situations where certain obligations are only applied to operators found to hold market power, or specific obligations linked to assignment of numbers or spectrum. Additionally, licenses (or the license regulation) may include provisions whereby the licensee may seek forbearance from certain terms and conditions.

In addition to those stated above, the following elements are typically included in the license terms and conditions:

- Background, definitions, and governing law to clarify how the license will be interpreted.
- For a multi-service licensing framework as planned in Myanmar, include a detailed explanation of the types of permitted networks and/or services under the license. The specific networks and services that may be provided should be identified, with the caveat that the regulator may add new networks and services as the market develops. For clarity, there may also be mention of what is not authorized under the license. The license categories should build off the relevant law and clarify elements that may be ambiguous in the law.
- Explicitly acknowledge that the license is technology- and service-neutral (within the range of networks and services that may be offered under the relevant license) to minimize entry barriers and facilitate convergence, thereby benefiting consumers through lower prices and a wider range of innovative services.
- Recognize that the license does not guarantee access to spectrum, numbering, or other scarce resources. The terms should be clear that such resources must be applied for and awarded separately. Reference numbering, spectrum and other relevant regulations.
- Specify whether licenses are hierarchical (e.g., an individual license is considered higher than a class license and permits the individual license holder to offer the services included in the class license, but not vice-versa).
- Identify the effective date of the license and processes regarding license duration, renewal, transfer, amendment, and suspension/termination.
- Identify and detail the relevant fees, ensuring they are reasonable (often cost-based) and applied in a non-discriminatory manner to all similarly situated licensees.
- Identify the specific rights and obligations imposed on operators found to hold market power, such as submission of tariffs. Include references to relevant regulations, such as tariff or competition regulations.
- Identify the rights and obligations imposed on operators offering certain types of services, such as public telecommunications services. Include references to other relevant regulations, such as interconnection or numbering regulations.

- Identify whether infrastructure sharing is permitted or mandated, referencing relevant regulations as necessary.
- State transitional provisions, including a timeframe for migration of the existing licensees and explanation of how the existing licenses will be incorporated into the new framework.

2.4 License administration

The regulator's role and responsibilities should be detailed in the telecommunications law and include authority to monitor the activities of licensees, enforce the license obligations, issue penalties where a licensee is found to have contravened the license obligations and decide disputes between licensees in a non-discriminatory manner. The license regulations should reference and implement the telecommunications law and clarify these duties, as needed, to provide guidance to all existing and potential licensees.

2.4.1 Monitoring

Monitoring of telecommunications activities includes ensuring that licensees are in compliance with telecommunications laws, regulations and license conditions and the authority to investigate alleged misconduct. Mechanisms to protect confidential information in the course of investigations should also be included. In particular, it is generally within the competency of the regulatory authority to gather and obtain information from licensees on both a regular basis (such as through annual reporting requirements), as well as on an "as-needed" basis with reasonable notice. Licensees should be required to provide such information as is reasonably requested. It is also recommended that the regulator use data (subject to protection of confidentiality) to publish statistics and reviews of the telecommunications sector on a regular basis.

For example, the licensing regulation in Tanzania explicitly permits the regulator to monitor the licensee's activities within reasonable parameters.²³ This includes the provision of information, which requires the licensee to furnish to the TCRA, upon request, "documents, accounts, financial data, estimates returns, reports, or any other information" as needed for the regulator to exercise its functions under the law. The TCRA may also at "reasonable times" enter a licensee's premises where telecommunications equipment is installed.

2.4.2 Enforcement

Enforcement procedures should be transparent and licensees should be afforded sufficient time to present their views and to remedy any situation before the imposition of penalties. The licensing regulations should clarify how licensees can appeal enforcement decisions, with the appellate body being independent from the regulator. The liberalized and streamlined licensing framework adopted in South Africa included the issuance of regulations by the regulator establishing the standard terms and conditions for both individual and class licenses, including penalties for non-compliance. The regulations provide for the imposition of fines based on the severity of non-compliance with license conditions.²⁴ The regulations reference the ICASA Act for procedures to determine non-compliance through a neutral committee.

²³ TCRA, The Electronic and Postal Communications (Licensing) Regulations, 2011, <http://www.tcra.go.tz/images/documents/regulations/licensing.pdf>.

²⁴ ICASA, Standard Terms and Conditions for Individual Licenses and Class Licenses, 2007, <https://www.icasa.org.za/LegislationRegulations/ExistingRegulations/MiscellaneousRegulations/STDTermsConditionsforClassLicenses/IndividualLicenses/tabid/126/Default.aspx>.

In addition to the above, other best practices for enforcement of telecommunications license obligations include:²⁵

- The license or legal framework includes specific enforcement provisions.
- The regulatory authority must give the licensee notice of any suspected or alleged license violations that come to the attention of the regulatory authority. If so, the timeframe for the licensee to investigate and take corrective action shall be clear and proportionate.
- The licensee should be provided with an opportunity to present his views before an enforcement action is taken.
- There should be a transparent appeals process against any licensing decision of the regulator.
- Licensees can appeal against all fines imposed by the regulator to a body independent of the regulator.
- Sanctions and fines are gradated and proportionate to infringement and the reality in the market.

2.4.3 Dispute Resolution

The licensing regulations should also address processes for resolving disputes as they may arise between the licensee and regulator, between licensees, or between licensees and consumers (although reference to other relevant regulations or laws is sufficient to avoid duplication or inconsistency). The regulations should include specific timeframes for resolving disputes, and it is also important for penalties to be reasonable and proportionate to the infraction. It is essential for licensees to be aware of the dispute resolution process prior to a dispute arising. In Jordan, the regulation on the Integrated Regime required the TRC to issue a regulation on Dispute Resolution Procedures, subject to public consultation, in order to “ensure mechanisms for exercise of rights of challenge that have been sought by respondents.”²⁶ The Integrated Regime regulation also set out a timeframe for the introduction of regulations on the Dispute Resolution Process to establish mechanisms to resolve disputes in a “timely and cost effective fashion” between licensees, between licensees and the TRC and between licensees and consumers.²⁷ There is also a timeframe for a regulation on Enforcement Provisions related to “sanctions, and procedures for their imposition, by means of which the TRC may fulfill its obligations under the Law when a licensee or other party is in breach of any license or other relevant condition of law...”²⁸

There are several best practices for dispute resolution relating to telecommunications licensing, including:²⁹

- The legal framework should provide for an effective dispute resolution process with clear, specific time periods for resolution.

²⁵ ITU, Licensing: Model Policy Guidelines and Legislative Text, 2010, http://www.itu.int/ITU-D/projects/ITU_EC_ACP/hipcar/reports/wg2/docs/HIPCAR_2-3-B_Model-Policy-Guidelines-and-Legislative-Text_Licensing.pdf.

²⁶ TRC, Information Memorandum Related to a Program of Licensing within the Fixed Telecommunications, 2004, p. 24.

²⁷ *Id.* at 41.

²⁸ *Id.*

²⁹ ITU, Licensing: Model Policy Guidelines and Legislative Text, 2010, http://www.itu.int/ITU-D/projects/ITU_EC_ACP/hipcar/reports/wg2/docs/HIPCAR_2-3-B_Model-Policy-Guidelines-and-Legislative-Text_Licensing.pdf.

- All parties must be clear on the process.
- Licensees should be able to appeal the regulator's decision to an impartial body.
- The license or legal framework relating to licensing should include dispute resolution mechanisms such as for example mediation, arbitration, and adjudication, as appropriate.

2.5 Timing of new license awards in Myanmar

As a final note on best practices for licensing regulations, most countries issue telecommunications licenses according to requirements and procedures that have previously been set out in an established legal and regulatory regime. However, due to the timing of the telecommunications reforms in Myanmar, two new telecommunications licenses have been subject to a tender process prior to the enactment of the Telecommunications Law. Although the Telecommunications Law is expected to pass prior to the actual award of the licenses, the proposed licenses have already been drafted and provided for review to the qualifying applicants. Additionally, the regulations implementing essential elements of the Telecommunications Law, including licensing regulations, have not yet been drafted.

This situation is rare, but there are examples from around the world, including in Afghanistan, Egypt, and Tonga, in which licenses have been issued while the telecommunications laws and regulations were in various states of transition or development. In such cases, the license document included language making it clear that the terms and conditions of the license could change as a result of the passage of the law and/or the approval of the implementing regulations. In Myanmar, it is essential that any licenses issued to the licensees prior to the enactment of the Telecommunications Act and implementing regulations include such language.

3 Competition Regulations

3.1 General Principles of Competition Law and Regulation

The general goals of competition policy are to protect the process of competition, maximize consumer welfare, and promote innovation and economic growth. In broad terms, competition is the process of rivalry between firms that endeavor to attract customers’ business and preferences in the marketplace on the merits of the products or services they provide. In this process, firms have incentives to innovate and be more efficient in order to reduce costs and pass savings on to consumers. This struggle for superiority may result in competitors that deliver lower value to consumers in terms of price, choice, quality, and innovation exiting the market. If the competitive process is not impaired, exit from the market should not generally be of concern for competition policy. Instead, competition policy should be concerned with identifying and sanctioning practices that are harmful to the competitive process and to consumers. Such practices generally include: (i) abuse of dominance; (ii) anticompetitive agreements; and (iii) mergers and other forms of consolidations that may lessen competition. This type of regulation is generally referred to as *ex post* regulation, meaning that it is adopted once the conduct or agreement has occurred, that is, “after the fact.” Its goal is to investigate and remedy, where appropriate, anticompetitive conduct or agreements.

In parallel, sector-specific competitive safeguards are often imposed to usher in effective competition in the various regulated sectors, such as telecommunications. These safeguards are critical to facilitate efficient entry in markets typically characterized by high entry barriers and to control for incumbent providers’ first mover advantages, thus ensuring a transition toward competitive markets. This type of regulation is generally referred to as *ex ante* regulation, meaning that it is adopted “before the fact.” Its goal is to preempt practices that may restrict, limit or obstruct competition until the market becomes effectively competitive (i.e., no single entity or group holds a dominant position in the specific relevant market). Until that time, *ex ante* regulation would apply asymmetrically, that is, imposing more burdensome requirements on the dominant operator(s). Once the market is effectively competitive, *ex ante* regulation should be rolled-back, relying on *ex post* regulation to achieve the benefits of the process of competition.

Table 5: Comparison of *ex ante* and *ex post* regulation

	<i>Ex post</i> regulation	<i>Ex ante</i> regulation
Enforcement Authority	Competition Authority and on occasion shared with Sector Regulator	Sector Regulator
Analysis	After the fact/backward-looking	Before the fact/forward-looking
Intervention	Finding of anticompetitive conduct required (i.e., abuse of dominance, anticompetitive agreement or merger)	Finding of dominance or significant market power (SMP) is sufficient

It is our understanding that under the draft Telecommunications Law of Myanmar (the “Draft Law”) the regulator will be charged with monitoring the state of competition in the various communications

markets and, where warranted, taking specific actions to ensure that they are effectively competitive.³⁰ To do so, the regulator is expected to be assigned a dual role:

- *Ex ante* regulation: the regulator “may issue directives” prohibiting “anticompetitive practices including but not limited to specific rules which would only apply to licensees who are in a dominant position in a telecommunications market.”³¹
- *Ex post* regulation: the regulator will also be charged with acting as the competition authority for the communications sector.³² Specifically, “[i]f a Licensee engages in anticompetitive conduct in the telecommunications market (...) the Regulator may, subject to the approval of the Ministry, direct a licensee in writing to cease such conduct.”³³ Similarly, if a licensee “fails to comply with the decision made by the Regulator with regard to anticompetitive practices” the regulator may issue a warning, suspend the license for a certain period, impose a fine, and terminate a license.³⁴

Both types of regulation are grounded on the same general principles of competition law and policy. Therefore, to promote effective competition, the regulator in Myanmar will have to assess whether *ex ante* or *ex post* intervention is warranted to achieve its statutory duties and what type of regulatory measures or remedies are optimal at the various stages of market development. These determinations will directly impact investment and commercial decisions of the various market participants and shape the new competitive landscape in Myanmar.

Based on generally accepted international best practices, the regulations developed in accordance with the Telecommunications Law are to be directed at establishing clear and transparent principles to be applied by the regulator to promote effective competition in Myanmar. Their goal is to provide market participants with certainty and predictability and give the regulator the necessary tools to assess competition in the market and adopt both *ex ante* and *ex post* regulation.

3.2 Definition of the framework for analysis

In assessing anticompetitive conduct, regulatory and competition authorities typically follow a series of sequential steps. As shown in Figure 2, both *ex ante* and *ex post* analysis starts by: (i) defining the relevant market; and (ii) assessing dominance. The inquiry ends at this point in the case of *ex ante* regulation. In the case of *ex post* regulation a further step is needed to determine whether the conduct is anticompetitive.³⁵ This general framework for analysis, or slight variations of it, is applied for the enforcement of competition rules in many countries around the world. For example, in the United

³⁰ To date, Myanmar has yet to enact general competition legislation and there currently is no general competition authority in the country. Nevertheless, based on discussions with representatives from the Ministry of Commerce we understand that a draft competition law has been developed and was recently submitted for comments to the Attorney General. Once the Attorney General approves the text, this draft law will be submitted by the Government to the Parliament. The current expectation is that the law will be passed by mid 2014.

³¹ Draft Law, §49(1).

³² The Draft Law bars conduct which “has the purpose or effect of substantially lessening competition in the telecommunications market” (Draft Law, §45), anticompetitive agreements (Draft Law, §45), and mergers and acquisitions “which may have the effect of the substantially lessening of competition in the telecommunications sector” (Draft Law, §49(2)).

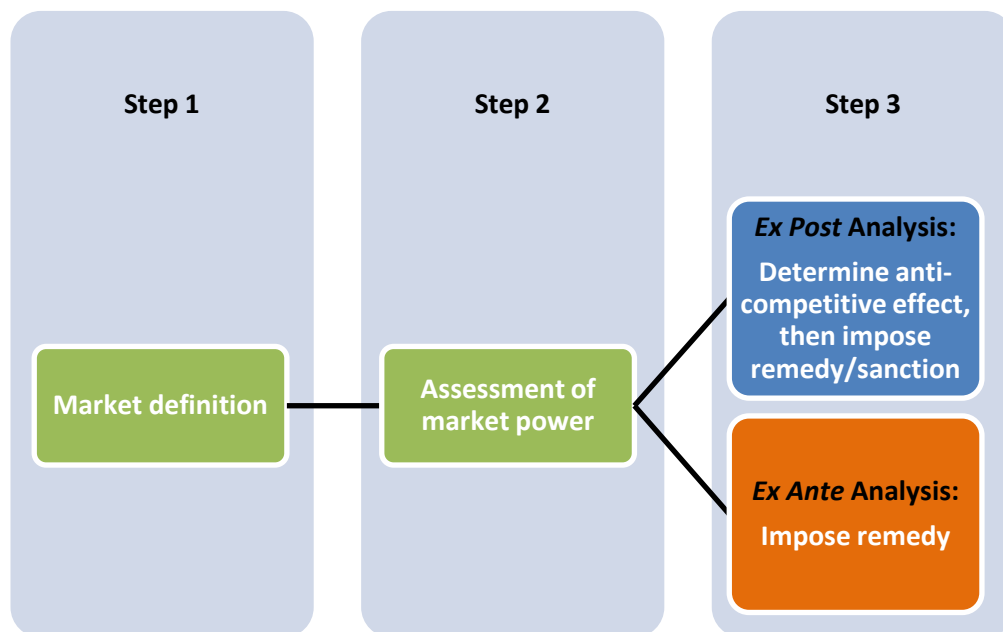
³³ Draft Law, § 48.

³⁴ Draft Law, § 65.

³⁵ This excludes cases of anticompetitive agreements (hard core cartels) generally treated as *per se* illegal which do not require a finding of competitive harm as further discussed in section 3.6.2.

Kingdom the *ex post* inquiry into anticompetitive conduct requires a finding of “whether an undertaking is dominant in a relevant market; and, if so, whether it is abusing that dominant position.”³⁶

Figure 2: General competition analysis framework



Source: TMG

3.3 Market definition

Market definition is an analytical tool to identify and define the boundaries of competition between firms.³⁷ It provides an initial framework for competition analysis and is a key first step used to determine whether a firm, or group of firms, are dominant. The relevant market is generally defined over two dimensions:³⁸ (i) the product market³⁹ and (ii) the geographic market.

This analysis typically begins by defining the boundaries of the relevant product market. This is done by identifying the closest substitutes to the product that is the focus of the investigation from the perspective of buyers (demand-side substitution) and of suppliers (supply-side substitution). Two related and complementary tests are generally applied in the identification of the relevant product market. First, a “reasonable interchangeability of use” test is employed, which asks whether or not the end use of the product and its substitutes are essentially the same, or whether the physical characteristics (or technical qualities) are similar enough to allow customers to switch easily from one to another.

³⁶ Office of Fair Trade (OFT), Abuse of a dominant position guidelines (2004), ¶ 2.3.

³⁷ To be clear, it is also possible to assess anticompetitive conduct using other analytical tools than relevant market definition. For example, this can be done by assessing diversion ratios – the fraction of unit sales lost by one product due to an increase in its price that would be diverted to another product. In practice, these tools are currently being used in some countries such as the United States in conjunction with market definition in certain cases. However, market definition is still the most widely used tool for competition assessment at this time.

³⁸ In some cases other dimensions are also reviewed, including a temporal dimension.

³⁹ We use the term “product” in this document for simplicity and note that it should be understood to encompass goods and services.

Second, the “hypothetical monopolist” or the “small but significant, non-transitory increase in price” (“SSNIP”) test is used as the standard methodology to define the relevant market. The SSNIP test can be generally described as follows:

1. The authority starts by assuming a hypothetical monopolist of the product under investigation;
2. It then asks whether the hypothetical monopolist may profitably sustain a small but significant increase in the price of such product (typically around 5-10%) above the competitive price.⁴⁰ This is generally done by assessing whether consumers can shift their demand in sufficiently large numbers to other substitute products (demand-side substitution) or whether other producers may begin offering the product in a relative short period of time (e.g., one year) without incurring in significant sunk costs;⁴¹
3. If the answer is “yes,” then the test is complete and the product market is defined; if the answer is “no,” then the process is repeated, but assuming the hypothetical monopolist is offering the larger set of products (i.e., including the product under investigation and its closest substitute products);
4. The authority again asks whether the hypothetical monopolist of the larger set of products could profitably sustain prices 5-10% above competitive levels. If so, the test is complete and the relevant product market is generally defined as the product under investigation and its closest substitute. If not, the authority now assumes that the hypothetical monopolist also controls the second closest substitute to the product under investigation and then repeats the process as many times as it is necessary until it finds a group of products for which it is profitable for the hypothetical monopolist to sustain prices around 10% above competitive levels (i.e., adding the next best substitute in every iteration).

The same general process is undertaken to define the geographic scope of the market. In this case, the inquiry focuses on determining whether a SSNIP by the hypothetical monopolist of the product under investigation is profitable in a specific geographic area. Depending on the circumstances of the case, the starting point can be the location of the supplier or the location of the customer.

The SSNIP test is the most commonly used methodology by regulatory and competition authorities around the world to define relevant markets both for *ex ante* and *ex post* regulation. This includes agencies in countries such as the United States,⁴² the United Kingdom⁴³ and in developing economies such as Bahrain,⁴⁴ Kenya,⁴⁵ Malaysia,⁴⁶ or Nigeria.⁴⁷ The European Commission also uses this test to

⁴⁰ Note that in some cases the prevailing market price may not be the competitive price, as a firm with market power may have already raised prices above the competitive level. If so, a SSNIP above the prevailing price would not be profitable as consumers would switch to other products. However, these products did not prevent the firm from raising prices above the competitive level and it would be inappropriate to include them in the relevant market.

⁴¹ Some authorities opt for defining market solely from the demand- side perspective and leaving supply- side analysis for assessing new entry and its impact on market power. Both approaches are valid and can be expected to result in the same conclusions regarding the existence of dominance in a specific case.

⁴² A review of the recent U.S. case law is provided in OECD, Market Definition (Oct., 2012), p. 321.

⁴³ OFT, Market definition guidelines (2004), ¶¶ 2.5-2.13.

⁴⁴ Telecommunications Regulatory Authority (TRA), Competition Guidelines (2010), p.9.

⁴⁵ Kenya Information and Communications (Fair Competition and Equality of Treatment) Regulations, 2010, § 6.

⁴⁶ MCMC, Guideline on Substantial Lessening of Competition, RG/SLC/1/00(1), §7.2.

⁴⁷ Nigeria Communications Law - Competition Practices Regulations (2007), § 19.

define relevant markets to assess *ex post* anticompetitive conduct⁴⁸ and to adopt *ex ante* regulation.⁴⁹ Furthermore, the methodology is endorsed by the ASEAN Economic Community,⁵⁰ the International Competition Network (ICN),⁵¹ and the OECD.⁵²

3.4 Dominance determination

3.4.1 Assessment of dominance

In economic terms, market power is typically considered as the power over price and output.⁵³ Market power is a matter of degree and all firms in differentiated product markets have some level of market power. Dominance, on the other hand, is a legal concept and is generally understood to exist when a firm holds significant market power (SMP), that is, a high degree of market power. The main characteristic of a dominant firm (or a firm in a dominant position) in a relevant market is its ability to act to a significant extent independently of its competitors, customers and ultimately of its consumers. This frees the dominant firm from the pressures that normally shape a firm's conduct in an effectively competitive market.

In assessing dominance, competition and regulatory authorities typically consider a combination of factors:

- Market share: these are often used as a proxy for market power.⁵⁴ In early stages of liberalization, market share has sometimes been used to set bright line rules to determine dominance (i.e., a firm will be deemed dominant if it holds more than a specific percentage of the market).⁵⁵ As markets mature, market share information alone increasingly becomes insufficient to establish a presumption of dominance and regulatory authorities typically consider the strength of other competitive constraints as well. In addition, market share can be used to establish safe-harbors (i.e., a firm will be presumed non-dominant if it holds less than a specific percentage of the market).
- Other competitive constraints: these are generally seen as market factors that prevent firms from profitably sustaining prices above competitive levels including: (i) constraints from existing competitors; (ii) constraints from potential competitors; (iii) barriers to entry and expansion in the relevant market; and (iv) the degree of countervailing buyer power.
- Evidence on behavior and performance: it is also relevant to look at the evidence regarding the actual effects of competitive constraints in the relevant market. This includes reviewing

⁴⁸ Commission Notice on definition of relevant market for the purposes of Community competition law (1997).

⁴⁹ Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002).

⁵⁰ ASEAN, Regional Guidelines on Competition Policy (2010), §3.2.3.2.

⁵¹ ICN, Unilateral Conduct Workbook, Chapter 3: Assessment of Dominance, ¶ 24. The ICN is an informal network that groups 104 competition agencies from around the world, with the common aim of addressing practical antitrust enforcement and policy issues.

⁵² OECD, Market Definition (Oct., 2012), p. 11.

⁵³ To be clear, market power can be exercised to affect other variables of competition, such as reducing quality, raising rival's costs, erecting entry barriers, and limiting innovation, among others.

⁵⁴ Note, however, that market share in itself does not determine whether a firm has market power and additional factors, such as competitive constraints discussed below, should also be considered.

⁵⁵ This does not mean that other factors could not be considered in the analysis, but simply that laws or regulation establish presumptions of dominance based on market share.

historical price and profit fluctuations to assess whether they comport to what would be expected in an effectively competitive market.

An *ex ante* assessment of dominance or SMP is aimed not only at reviewing the level of competition in the market at the time of the analysis, but also at assessing whether the market will become competitive within a specific timeframe. This entails a prospective or forward-looking analysis which requires assessing, for instance, if changes in the marketplace can reasonably be expected to improve competition over the timeframe of the analysis. In addition, to avoid circularity when assessing dominance from an *ex ante* perspective, regulatory authorities perform their analysis assuming that no *ex ante* regulation is in place.⁵⁶

In the European Union, at the early stages of the liberalization process the definition of SMP for *ex ante* regulation in the telecommunications market was established at 30% market share.⁵⁷ This definition was adopted to usher in the liberalization process and was later substituted by a definition under which SMP is equivalent to the concept of dominance under competition law. This requires a more detailed analysis of a broad list of competitive constraints in the market.⁵⁸ Similarly, EU courts have established presumptions of dominance based on market shares for the purpose of *ex post* regulation. For example, a legal presumption exists that a 50% or more market share results in dominance.⁵⁹ Some countries establish safe harbors (i.e., thresholds below which a dominance finding is unlikely) based on market share. For instance, in the United Kingdom if a firm’s market share is below 40% the OFT considers it “unlikely” that such firm is dominant.⁶⁰

A review of competition laws in the ASEAN countries shows that some form of presumption of dominance based on market share is used for *ex post* enforcement in the majority of members that have enacted competition laws regulations. As shown in Table 6, the specific threshold for single firm dominance varies widely, ranging from 30% in Vietnam to 60% in Singapore (the higher the threshold, the laxer the standard to assess dominance).

Table 6: Presumption of dominance based on market share in ASEAN countries

	Dominance	Joint Dominance
Brunei Darussalam	N/A	N/A
Cambodia	N/A	N/A
Indonesia	Market share over 50%	Two or three enterprises jointly hold 75% or more share
Malaysia	No presumption of dominance	No presumption of dominance

⁵⁶ This is sometimes referred to as the “Modified Greenfield Approach.” Its goal is to ensure that from an *ex ante* perspective the absence of dominance is only found and regulation only rolled back where markets have become sustainably competitive, and not where the absence of SMP is precisely the result of the regulation in place.

⁵⁷ Article 4(3) of the Directive 97/33/EC of the European Parliament and of the Council of 30 June 1997 on interconnection in telecommunications with regard to ensuring universal service and interoperability through application of the principles of open network provision (ONP).

⁵⁸ See Framework Directive, ¶ 25.

⁵⁹ See Case -62/86 *Azko Chemie v Commission* (1991).

⁶⁰ OFT, Abuse of a dominant position guidelines (2004), ¶ 4.18.

Myanmar	N/A	N/A
Philippines	No presumption of dominance*	No presumption of dominance*
Singapore	Market share over 60%	
Thailand	Market share over 50% and a revenue threshold	Top three enterprises jointly hold 75% or more share and a revenue threshold
Vietnam	Market share over 30%	Two enterprises jointly hold 50% or more share Three enterprises jointly hold 65% or more share Four enterprises jointly hold 75% or more share

* In the Philippines the term dominance is not used in the applicable legislation. Instead the term monopoly is employed.

Source: based on ASEAN, *Competition Handbook, Country Annexes*.

The ICN also supports the approach towards assessing dominance, noting that while “[l]aws differ in the way dominance/substantial market power is defined [m]ost jurisdictions find that a rigorous assessment of whether a firm possesses dominance/substantial market power, going well beyond market shares, is highly desirable.”⁶¹ ICN further adds that “[i]n jurisdictions with a more formalistic definition of dominance based on market shares, it is recommended that agencies be particularly rigorous in their analysis of the conduct at issue.”⁶²

3.4.2 Collective dominance

A dominant position may also be held jointly when two or more legally independent firms are linked in such a way that they are able to align their behavior and adopt a common policy on the market. While the specific scope of this concept is still developing for the purpose of abuse of dominance, it is often used in *ex ante* regulation and in merger review. An example of this is sometimes called tacit collusion, where due to the nature of the market, firms may be able to coordinate their pricing policy without explicitly agreeing on price. For this to happen, the firms must be able to (i) monitor each other’s compliance with the common policy; (ii) coordination must be sustainable over time; and (iii) existing and potential competitors must not be able to successfully challenge the common policy.

Collective dominance is a concept widely included in competition regulations both for *ex ante* and *ex post* enforcement purposes. It is generally included in the statutes or regulations using the following language: “Any abuse by one or more undertakings of a dominant position...”⁶³ This formulation, or a variation thereof, is included in the competition laws of the United Kingdom,⁶⁴ Malaysia,⁶⁵ and

⁶¹ ICN, *Dominance/Substantial Market Power Analysis Pursuant to Unilateral Conduct Laws, Recommended Practices*, p.1

⁶² *Id.*

⁶³ Treaty on the Functioning of the European Union, art. 102.

⁶⁴ Competition Act (1998), §18(1).

⁶⁵ Competition Act (2010), §2.

Singapore,⁶⁶ among many others. Furthermore, the recognition of joint dominance is endorsed by the ASEAN Competition Guidelines.⁶⁷

3.5 Abuse of dominance

3.5.1 Prohibition of abuse of dominance

Holding a dominant position is not an offense; it is the abuse of such dominance that is the concern of *ex post* competition policy.⁶⁸ It is not only legitimate, but desirable for a firm to attempt to capture a dominant share of the market based on the merits of its products or services and its business acumen. In the telecommunications sector, firms may often need to become large to realize economies of scale and achieve lower production costs, especially considering the significant sunk costs associated with network deployment.

Ex post competition policy is concerned with cases where a firm, or group of firms, abuses its dominant position in a way that harms competition. While there is no overarching definition of what constitutes abuse, there are some guiding principles: (i) behavior is only abusive where it causes or is likely to cause clear and demonstrable harm to consumers; (ii) competition law should not be used to protect competitors as consumer welfare is not enhanced with the protection of inefficient firms; and (iii) the law of abuse should not focus on the short term.

Furthermore, abusive conduct generally falls into one or both of the following categories: (i) conduct which exploits customers or suppliers (e.g., excessively high prices), or (ii) conduct which amounts to exclusionary behavior, because it removes or weakens competition from existing competitors, or establishes or strengthens entry barriers, thereby removing or weakening potential competition.

This general categorization of anticompetitive abuse of dominance is typically included in most competition legislation, including the ASEAN Competition Guidelines.⁶⁹ Similarly, they have also been identified as anticompetitive abuses under the EU law.⁷⁰

Specific practices that are generally considered as an abuse of dominance include the following:

- **Exclusive dealing:** A dominant firm may try to foreclose its competitors by hindering them from selling to customers through the use of exclusive purchasing obligations or rebates, together referred to as exclusive dealing. Exclusive dealing that generally is cause for concern includes exclusive purchasing and conditional rebates.
- **Tying and bundling:** Tying usually refers to a practice where customers of one product, the tying product, are required to also buy a second product, the tied product, from a dominant firm. Bundling is closely related and consists of the sale of two products as a single package.

⁶⁶ Competition Act (2006), §47(1).

⁶⁷ ASEAN Competition Guidelines, p. 10. As shown in Table 6 some ASEAN countries have also set market share threshold to assess joint dominance within their jurisdictions.

⁶⁸ Note that *ex ante* regulation seeks to preempt anticompetitive conduct. Hence, the mere existence of dominance or SMP is sufficient to trigger regulatory action and no specific abuse needs to be proven.

⁶⁹ ASEAN Competition Guidelines, p. 10.

⁷⁰ See EC, Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (2009), ¶ 32-90.

- **Predatory pricing:** Predatory pricing is a strategy whereby a firm deliberately incurs short term losses (by selling below a relevant measure of costs) so as to eliminate a competitor and then be able to charge excessive prices in the future.
- **Refusals to supply:**⁷¹ The concept of refusal to supply covers a broad range of practices, including refusals to supply products to existing or new customers, or refusal to grant access to an essential facility or a network.
- **Margin squeeze:** A vertically integrated firm that is dominant in an upstream market (input market) charges a price for the product in the upstream market which, compared to the price it charges in the downstream market, does not allow even an as efficient competitor to trade profitably in the downstream market on a lasting basis.
- **Cross-subsidization:** This involves a firm using the profit that it receives from services or facilities it provides in markets where it is dominant to reduce the prices of services or facilities that it provides in markets that are subject to a greater degree of competition.

3.5.2 Justifications of conduct

A dominant firm may justify its conduct and the regulator should examine such claims. Specifically, the dominant firm may demonstrate that its conduct is objectively necessary or that its conduct produces substantial efficiencies which outweigh any effects on competition and consumer welfare in the affected markets. In this context, the regulator should assess whether the conduct in question is indispensable and proportionate to the goal allegedly pursued by the dominant firm.

Incorporating the analysis of such justification is a key component of competition enforcement around the world. As competition policy has evolved, regulators and competition authorities rely on case-specific and fact-driven reviews of business conduct to assess their competitive impact. This is the practice, for instance, in countries such as Canada⁷² and United Kingdom,⁷³ among others. Also, this approach is consistent with the European Commission guidelines on assessment of dominance⁷⁴ as well as the ASEAN competition guidelines.⁷⁵

3.6 Anticompetitive agreements

3.6.1 Prohibition of Anticompetitive agreements

Competition regulations should clearly define under what circumstances agreements⁷⁶ between firms are deemed anticompetitive and illegal. In broad terms, an anticompetitive agreement or cartel is an agreement between firms not to compete with each other. Because consumers directly benefit from

⁷¹ Note that the general starting point is that any firm, whether dominant or not, should have the right to choose its trading partners and dispose freely of its property. Imposing a duty to supply from an *ex post* perspective, even for a fair remuneration, may undermine firms' incentives to invest and innovate and, thereby, possibly harm consumers.

⁷² Competition Bureau Canada, *The Abuse of Dominance Provisions Enforcement Guidelines* (2012), p. 11.

⁷³ OFT, *Abuse of a dominant position*, § 5.3.

⁷⁴ Communication from the Commission – Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (2009).

⁷⁵ ASEAN Competition Guidelines, p. 10.

⁷⁶ We use the agreement in this document for simplicity and note that it should be understood to encompass other arrangements and concerted practices that have anticompetitive effects.

competition (e.g., with lower prices, better products and services, etc.), when competitors agree to forgo competition, consumers lose those benefits. Three elements are relevant in defining cartels:

- Agreements that form a cartel do not need to be formal or written. In fact, in most cases cartels are secret and parties to such agreements go to great lengths to keep them as such. In some cases, agreements may be tacit;
- Agreements may be between firms that operate in the same level of the economy, or horizontal (e.g., manufacturers, distributors, or retailers), or between firms that operate in different levels of the economy, or vertical (e.g., between a manufacturer and its distributors); and
- Agreements must harm competition, and agreements entered into in the normal course of business or that do not substantially lessen competition should not be prohibited.

3.6.2 Definition of “hard core” cartels and their standard of review

Some agreements are so egregious to competition that they are generally understood not to have any redeeming value. These types of agreements are termed “hardcore cartels” and the following conduct is commonly included in this category:

- Price fixing: agreements to raise, fix or maintain prices, to set discounts or establish a range outside which prices are not to move;
- Bid-rigging: an agreement may involve cover bidding to help one firm in winning the tender;
- Output restrictions: an agreements on production volumes, sales volumes, or percentages of market growth
- Market allocation: agreements to divide and share markets, whether by territory, type, or size of customer, or in some other ways.

Competition regulations typically address whether specific types of agreements should be treated as *per se* illegal or analyzed under an effects test. A *per se* rule focuses exclusively on whether a specific conduct occurred and does not require proof of harm to competition. Hence, no efficiency defenses are allowed. Hard core cartels such as price fixing agreements, for example, are typically presumed to have no redeeming values and therefore are considered *per se* illegal. The abovementioned categories of agreements are deemed to be *per se* illicit in the majority of countries around the world. This is the case, for instance, in Malaysia,⁷⁷ United Kingdom,⁷⁸ Singapore,⁷⁹ and the United States.⁸⁰ The ASEAN Competition Guidelines,⁸¹ the ICN,⁸² and the OECD also support this categorization.⁸³

On the other hand, if parties to an agreement are not dominant and dominance would not arise as a result of the agreement, anticompetitive effects should be assessed in the relevant market. In addition, in cases other than “hard core cartels,” the regulator may also determine the pro-competitive benefits produced by the agreement and assess whether these pro-competitive effects outweigh any potential

⁷⁷ Competition Act (2010), § 4(2).

⁷⁸ OFT, Cartels and the Competition Act 1998 (2005).

⁷⁹ Competition Act (2006), § 34(2).

⁸⁰ Department of Justice and Federal Trade Commission, Antitrust Guidelines for Collaborations Among Competitors (2000), § 3.4.

⁸¹ ASEAN Competition Guidelines, p. 8.

⁸² ICN, Building Blocks for Effective Anti-Cartel Regimes, p. 10.

⁸³ OECD, Recommendation of the Council Concerning Effective Action Against Hard Core Cartels (1998).

anticompetitive effects. Similarly, individual and block exemptions for certain types of agreements are also used to better focus anti-cartel enforcement efforts.

3.6.3 Leniency

Leniency programs are designed to break the code of silence and secrecy among cartel conspirators. To maximize the incentive for defection and encourage cartels to break down more quickly, it is important not only that the first to confess receive the “best deal,” but also that the terms of the deal be as clear as possible at the outset. A general offer to reduce penalties in exchange for information may not be good enough to encourage firms to come forward, as the benefits of remaining in the cartel may appear larger and more certain than the unknown reward that would result from confessing.

Leniency programs have been implemented in many countries including the United States,⁸⁴ the United Kingdom,⁸⁵ and Singapore,⁸⁶ among others. Leniency policies are also supported by the ASEAN Competition Guidelines,⁸⁷ the OECD,⁸⁸ and the European Commission.⁸⁹

3.7 Remedies

3.7.1 Ex post remedies

Once a finding of competitive harm has been made, competition authorities should choose the type of remedy or sanction that is best suited to restore effective competition and deter similar anticompetitive conduct in the future. To this end, competition authorities are generally given a broad set of potential actions to choose from, including:

- Fines: these are the most widely used tool to punish anticompetitive conduct, although they may not always be an effective remedy for restoring competition. Fines are often based on a percentage of the annual revenues of the company concerned (e.g., up to 10% of annual revenues) or on a maximum monetary amount. Fines should be balanced such that they are high enough to create the desired deterrent effect, but not so high as to result in the bankruptcy of the offending firm (which could paradoxically lead to less competition in the market).
- Remedies: two broad categories of remedies are normally employed to restore competition in the market.
 - Structural remedies involve mandating a change in market structure, such as breaking up a firm. When feasible, these types of remedies are often the preferred choice as they produce an immediate and durable change to the market structure. However, structural remedies may be costly for the firm affected and may not directly address the factors that facilitated the anticompetitive conduct. Hence it is critical for these factors to be assessed when considering structural remedies, and especially such remedy may make restoring competition in the market more likely;

⁸⁴ DOJ, Corporate Leniency Guidelines (1993) and DOJ, Individual Leniency Guidelines (1994).

⁸⁵ Leniency and no-action, OFT'sOFT's guidance note on the handling of applications (2008).

⁸⁶ Competition Commission Singapore (CCS), Guidelines on Lenient Treatment for Undertakings Coming Forward with Information on Cartel Activity Cases (2009).

⁸⁷ ASEAN, Competition Guidelines, p. 22.

⁸⁸ OECD, Using Leniency to Fight Hard Core Cartels (2001).

⁸⁹ Commission Notice on Immunity from fines and reduction of fines in cartel cases (2006).

- Behavioral remedies consist in imposing affirmative or negative duties, such as “cease-and-desist” orders or obligations to provide access to a network. These are also widely used, with “cease-and-desist” orders the most common means used to stop ongoing competition violations. However, these types of remedies are often costly for the competition authority as they entail continued monitoring of the affected firm’s actions.
- Compensation: competition authorities often attempt to force violators to return unlawful profits. For example, in cartel cases, this could be estimated as the amount charged in excess of the competitive price. While these amounts may be difficult to calculate, reasonable estimates may be based on the costs and profits of the cartel members and comparisons with other companies in the same or another comparable country.
- Settlements and commitment: to facilitate adoption of remedies and sanctions, competition authorities often consider negotiated solutions. This facilitates swift conclusion of investigations, reducing the enforcement costs for the authorities. Also, such commitments may serve to set up rules on how violators should implement and comply with structural and behavioral remedies imposed by the authority.

3.7.2 Ex ante remedies

A finding of dominance (single or collective) triggers the adoption of *ex ante* remedies by the regulator. These should be appropriate and proportionate to address the specific circumstances of the case at hand. *Ex ante* remedies can conceptually be applied both at that retail and wholesale market levels. However, whenever possible any observed market failure at the retail level should be addressed first by regulating its wholesale input market. Moreover, in order to adjust regulation over time, market reviews should be conducted periodically (every 2 to 3 years if warranted). If after conducting a market review process, the authority finds that a previously regulated market is now effectively competitive (i.e., that no firm, or group of firms, is in a dominant position), then *ex ante* regulation should be withdrawn or amended.

In general the following broad set of *ex ante* remedies are used internationally:⁹⁰ (i) transparency (e.g., in the form of publishing reference offers); (ii) non-discrimination; (iii) accounting separation; (iv) obligations for access to and use of specific network facilities; (v) price control and cost accounting obligations; (vi) functional separation measures; (vii) carrier selection and pre-selection; and (viii) number portability. This set of remedies is consistent with the European regulatory framework for electronic communications and is applied by EU member states.⁹¹

3.8 Merger review

A review of the competitive impact of mergers is commonly performed by competition authorities and/or sector regulators around the world. This includes countries such as Singapore,⁹² the United States,⁹³ and the United Kingdom,⁹⁴ among others. The term merger when used in competition policy includes a broad range of corporate transactions. For example:

⁹⁰ Note that this is not an exhaustive list.

⁹¹ Article 5 and Articles 9 to 13 of Directive 2002/19/EC (Access Directive), and Article 17 of Directive 2002/22/EC (Universal Service Directive).

⁹² CCS, Guidelines on Merger Procedures (2012).

⁹³ DOJ and FTC, Horizontal Merger Guidelines (2010).

⁹⁴ OFT, Merger Assessment Guidelines (2010).

1. Where A acquires all, or the majority of, the shares in B, this would be a merger if A is able to control the affairs of B;
2. Even if A acquires a minority stake in B, it can be described as a merger, if A is able to control B;
3. The acquisition of assets can also amount to a merger; and
4. The combination of parts of two firms into a joint venture can amount to a merger.

As such, the essential question is whether previously independent businesses have come or will come under common control, with the consequence that, in the future, the market will be less competitive.

Most mergers do not harm competition; some may be pro-competitive because they benefit consumers by lowering costs and/or increasing innovation. Many others are competitively neutral, for example because post-merger competition will remain and continue to discipline the merged firm and its rivals.

However, some mergers can lead to markets being less competitive in the future. Merger control is directed at preventing mergers that would be likely to deprive customers of the benefits of competition by significantly increasing the market power of firms. Concentrations that would significantly impede effective competition in the market, in particular as a result of the creation or strengthening of a dominant position, are generally deemed unlawful.

A central concept of merger review is therefore a comparison of competition with and without the merger. The competitive situation without the merger is sometimes referred to as the counterfactual. In most cases, the best starting point for the counterfactual is prevailing conditions of competition, i.e., the conditions of competition existing before the merger. It is also necessary to take into account likely and imminent changes in the nature of competition in order to reflect, as accurately as possible, the nature of rivalry without the merger.

There are typically three main types of mergers:

- Horizontal mergers: involve actual or potential competitors in the same relevant market.
- Vertical mergers: involve companies operating at different levels of the supply chain.
- Conglomerate mergers: involve firms that are in a relationship that is neither horizontal (as competitors in the same relevant market) nor vertical (as suppliers or customers).

3.9 Relationship between the future general competition law and sector-specific competition regulation

As noted above, we understand that a general competition law will be enacted in Myanmar by mid 2014 and that this law will establish a general competition authority. In this context, it is critical that the competition rules set forth under the Telecommunications Act and those established pursuant to the general competition legislation be consistent. As such, sector specific competition rules should be based on the general competition framework and principles, with the latter taking precedence. In addition, it is also relevant that the authority responsible for enforcing competition law in the telecommunications sector be clearly defined to avoid overlaps, uncertainty or contradictory decisions. In countries where there are both a general competition authority and a sector regulator with powers to review competition cases, it is critical for mechanisms to be put in place to avoid the above-mentioned problems. This can be done by assigning exclusive oversight authority to a single entity, either to (i) the competition agency (e.g., in the United States) or (ii) the sector regulator (e.g., Singapore and Hong Kong). Alternatively, if concurrent authority is assigned to the competition and regulatory agency, then rules must be adopted to coordinate their actions (e.g., EU Framework).

4 Spectrum Regulation

Regulations should be designed to ensure that the spectrum is put to its highest economic and social use, and that it can support the overarching goals of the Myanmar ICT Development Master Plan (2011-2015). To meet these general goals, the regulations must be clear, non-discriminatory, and convey certainty to inspire confidence among investors, while also providing the flexibility needed to accommodate rapid advances in technology and changing user demands. Licensing procedures should be consistent with the overall framework noted in section 1, while accounting for the fact that spectrum is a limited public resource. The regulations also must promote the most efficient and interference-free use of frequencies as possible.

4.1 Spectrum Allocation

4.1.1 Spectrum Availability

To support healthy competition and foster the introduction of advanced services, adequate spectrum should be made available. Most countries around the world now are engaged in a process to identify additional spectrum, particularly for mobile broadband use. Spectrum is the key component underlying wireless services. Without adequate spectrum, licensees cannot provide the services demanded by consumers, businesses and government users, or they may be able to do so only with limited capacity or low quality of service. In addition, limited spectrum may constrain how many companies can enter the market. It is critical for adequate spectrum to be available across multiple bands to allow licensees to use lower bands for covering rural and other areas, while higher frequencies can be used to ensure coverage and capacity in more urban areas. Making spectrum available according to a clear plan or schedule will help current and prospective licensees plan better for the future. Policy makers around the world are increasingly examining ways to free up spectrum resources and facilitate more effective use of spectrum for mobile services, particularly mobile broadband. They are using a variety of mechanisms, including reallocating spectrum bands to mobile services (e.g., digital dividend), releasing government use of spectrum to commercial use, permitting spectrum refarming, and facilitating spectrum sharing. Many regulators carry out periodic reviews to determine spectrum needs and the potential availability of specific spectrum bands for future use (see also section 4.4.1). Ofcom in the United Kingdom, for example, recently consulted on the future demand for mobile broadband spectrum⁹⁵ and the future use of the 700 MHz band.⁹⁶

4.1.2 Harmonization

National spectrum allocations and use (channelization plans) should be harmonized, to the greatest extent possible, with both regional and international allocations. There are many benefits of harmonization. First, use of spectrum and a band plan that is consistent with international use allows a country to realize the benefits associated with economies of scale, including lower costs for equipment built for world markets (as opposed to a single country or region) and access to the most up to date equipment (manufacturers develop equipment for the largest markets first). This benefits consumers and businesses alike. Second, harmonization minimizes cross-border interference and makes resolution of any interference that does occur much easier. Conversely, spectrum use that does not conform to regional or international plans risks causing interference in border areas.

⁹⁵ See <http://stakeholders.ofcom.org.uk/consultations/cfi-mobile-bb/>

⁹⁶ See <http://stakeholders.ofcom.org.uk/consultations/700mhz-cfi/>

The ITU is responsible for allocations at the international level. ITU World Radiocommunication Conferences make changes to the allocations contained in the International Table of Frequency Allocations, which also contain broad regional allocations. Likewise, regional bodies, such as the European Union⁹⁷ and the Asia-Pacific Telecommunity (APT)⁹⁸ have made harmonization of frequency allocations a fundamental component of their spectrum policy.

4.2 National Table of Frequency Allocations

The Ministry or Regulator should create and regularly update (i.e., typically five years) a comprehensive, publicly available Table of Frequency Allocations for the country. These tables show what frequencies have been allocated for use by which radiocommunication services. Often, such tables are tied to the specific regulations that govern the use of each band/service or are part of the regulations themselves. Maintaining an up-to-date allocation table allows policymakers, licensees, and potential spectrum users to see which frequencies are allocated to which services, giving an accurate picture of how spectrum is being used. National tables also sometimes show the relevant international allocations as well, allowing users to see where national use is consistent with international use – and where it is not. Updates should be based on public consultations.

Many countries maintain such tables in various forms. Many follow the table format of the ITU, such as the United States,⁹⁹ while graphic charts are also used, as in Malaysia and Singapore.¹⁰⁰

4.3 Unlicensed/license-exempt spectrum

Spectrum should be set aside for use by devices that are unlicensed (license-exempt). Some of the most innovative use of spectrum over the last two decades has come in bands that are set aside for use by devices or services that do not require a license. The most common example is the use of the 2.4 GHz band for Wi-Fi, which is now ubiquitous around the world, but a wide range of devices operate using unlicensed spectrum, including cordless phones, baby monitors, etc. In fact, most countries around the world have set aside common bands of frequencies, including at 900 MHz, 2.4 GHz, and 5 GHz, for use of these devices. The key characteristics of these devices and the spectrum they use are that they are generally low power, must accept any interference from a licensed source, and cannot cause interference to any licensed source. Unlicensed does not mean unregulated, however. Regulations are needed to specify what spectrum can be used and on what basis (is the spectrum shared with other, licensed, services, or is the whole band set aside solely for unlicensed use?). To ensure that devices do not cause interference, regulations are also needed to specify power levels, operating characteristics and limitations, and other technical details.

4.4 Spectrum Planning

4.4.1 Inventory of Current Spectrum Use

National regulators should develop and maintain a spectrum inventory that lists all users of the specific frequency bands, like the European Commission, which is currently building a comprehensive spectrum

⁹⁷ Decision No 243/2012/EU, March 14, 2012, “Establishing a multiannual radio spectrum policy programme,” available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>.

⁹⁸ See, for example the APT 700 MHz band plan, available at: http://www.apsec.org/sites/default/files/APT-AWF-REP-14_APT_Report_Harmonized_Freq_Arrangement.doc.

⁹⁹ See <http://transition.fcc.gov/oet/spectrum/table/Welcome.html>.

¹⁰⁰ See http://www.wrcmalaysia.my/sr/downloads/cache/files/malaysian_spectrum_allocations_chart.pdf and <http://www.ida.gov.sg/~media/Files/PCDG/Licensees/SpectrumMgmt/SpectrumNumMgmt/SpectrumChart.pdf>.

inventory. Keeping an accurate and up-to-date list of all licensed radiocommunication operations is critical for managing the spectrum, on both a day-to-day and longer term basis. Such a list allows regulators and licensees to know which parties are using the spectrum and where. The final report of the European Commission's spectrum inventory project contains detailed stakeholder information, assessments of the efficiency of spectrum use across bands as well as estimates of the economic value of spectrum.¹⁰¹ This is critical, for example, in resolving any interference issues that may occur. For the longer term, keeping a good inventory will aid in monitoring spectrum use by existing licensees and users and aid in identifying where spectrum may be underutilized, inefficiently used, or able to be reallocated. For example, in cases where spectrum may not be used much or efficiently, a spectrum inventory can identify those users that may be required to move to another band to make way for more efficient or innovative use. Conversely, if a band is intensively used – it has many licensees or users or the spectrum is used very heavily – that would indicate that the band is not subject to being reallocated.

4.4.2 Develop a Spectrum Plan

National regulators should develop and maintain a spectrum plan that comprehensively addresses allocations and radiocommunication services that will be updated and developed for the future. Good planning, based on open consultations, is essential for good spectrum use. Planning allows spectrum needs to be met in a timely fashion, and (hopefully) ensures that national use is harmonized with international/regional use. A clear plan will promote transparency in the management of the spectrum as all stakeholders can see and contribute to the vision of spectrum services going forward. IDA has a comprehensive plan for the future development of radiocommunication services in Singapore, including fixed, mobile, broadcasting, satellite, and short-range devices. It summarizes current use and identifies where changes to allocations/services may be considered to meet future demands. In many cases, especially recently, spectrum plans have been established as part of an overall plan to achieve larger telecommunications goals, particularly in the case of promoting broadband development. In these cases, the spectrum plan is an integral part of the overall broadband plan, and is often a key component of how a country plans to meet its broadband deployment goals.

In Australia, the ACMA produces a rolling five-year “Outlook” that contains a demand analysis for the period as well as proposed approaches to addressing demand issues, including a specific work plan.¹⁰² In the development of its National Broadband Network (NBN), Australia also explicitly included wireless as a key component. The current plan calls for fiber-enabled services to reach 93 percent of the population, with the remaining seven percent being served either by terrestrial wireless or satellite services.¹⁰³

4.5 Spectrum Assignments (Licensing)

4.5.1 Award Mechanism

Clear regulations and guidelines that will guide the decision of how spectrum licenses are to be awarded should be developed. Because radiocommunication services differ, economic and competitive conditions change, and spectrum is limited, different processes for awarding spectrum licenses will be needed. There are multiple methods for awarding (granting licenses for the use of) spectrum. In general, these can be categorized as either administrative or market-based. Historically (up until the

¹⁰¹ For a progress report, please see http://www.plumconsulting.co.uk/pdfs/Plum_Oct2012_Inventory_and_review_of_spectrum_use.pdf.

¹⁰² See http://www.acma.gov.au/WEB/STANDARD/pc=PC_410352.

¹⁰³ See <http://www.nbn.gov.au/about-the-nbn/what-is-the-nbn/>.

early 1990s) almost all spectrum was awarded administratively. Often, licenses were given out on a first-come, first-served basis. But as radiocommunication services developed – particularly with the development of commercial mobile services – it became clear that there was more demand for spectrum than supply and that a method would have to be devised to pick between multiple companies vying for the same spectrum or license.

Initially, governments used a comparative process, often called a beauty contest, to pick between multiple potential licensees. Often, however, this process was very time consuming and required many resources on the part of applicants and the government agencies doing the evaluating. And, of course, the more applicants, the more complicated the process. In some cases, regulators were accused of favoritism or making arbitrary decisions when applicants were very close in their abilities. There was also a growing belief that spectrum was increasingly valuable, and that value was not being captured by the public, which “owns” the resource.

To address some of these problems, market-based mechanisms were developed. For many of the commercial mobile licenses that were granted in the 1990s and 2000s, auctions were the preferred method of license award. Auctions allow spectrum to be quickly awarded, and help to ensure that frequencies go to those who need and value them the most. They also help to make sure that the public is compensated for the use of the spectrum resource. The potential problem with an auction, however, is that the government can see it solely as a way to make money, which can lead to prices that are too high. Likewise, applicants can also bid up the spectrum to very high prices, especially if future spectrum availability is in doubt. This may negatively affect the companies’ ability to then finance and construct the network.

Over time, hybrid approaches have been developed whereby a government makes a license available through a tender process. This often combines the administrative process of “pre-qualification” whereby suitable companies are picked from many potential applications and then companies pledge monetary or non-monetary (coverage) resources in order to demonstrate that they are the best candidate.

In situations where spectrum is limited and multiple potential licensees have been identified, auctions or comparative assessments can be employed. Where spectrum is less constrained or where a single licensee is envisioned, administrative assignment may suffice. For each type of radiocommunication service, the government shall develop the appropriate licensing conditions based on a public consultation process.

In Singapore, spectrum has been assigned either by auction or administratively, depending on the service to be provided. IDA used a market-based approach (i.e. auction) for 3G, 2G and WBA spectrum assignments, but for other services, such as trunked radio and fixed links, the administrative approach has and will continue to be applied, unless there are competing demands for the spectrum.

4.5.2 Post-award spectrum transfers

After a license has been granted, it should be transferable to another licensee in whole or in part. This enhances the value of the spectrum and ensures it can go to the party that can put it to best use. Specific frequencies may be disaggregated or subdivided from the original set of frequencies, with the licensee retaining some frequencies and another entity acquiring the rights to others. Licenses may also be geographically divided, allowing a party to acquire rights to a specific region of the country. Such transfers are generally allowed according to regulations set out by the government and with prior approval. Such “secondary market” transactions have become increasingly a part of spectrum management in the last two decades.

In 1989, New Zealand was the first country to allow spectrum rights to be traded, implementing a system that separates management rights from license rights. In Malaysia, the regulations specify that a license may be transferred or traded.¹⁰⁴ Since then, Australia, the United Kingdom, the United States, and Singapore, among others, have also allowed some form of spectrum trading. The EC is also pushing to implement greater spectrum rights trading, based on the belief that it will stimulate economic growth.¹⁰⁵

4.5.3 License term

License durations vary around the world, and are often different for different types of service. In Malaysia, for example, a spectrum assignment is valid up to 20 years.¹⁰⁶ Likewise, in many European countries, initial 3G licenses were valid for 20 years, although Sweden limited its licenses to 15 years.¹⁰⁷ For commercial mobile licenses, the initial licenses are generally valid for a minimum of 15 years. The regulator may determine, as part of the consultation on the license process, what the actual duration will be in specific cases. Many countries limit the duration of the initial license term to 25 years.

4.5.4 License renewal

To increase certainty and incentives for investment, licenses should come with an expectancy of renewal, meaning that the licensee can generally expect to have its license renewed unless it has failed to meet regulatory or license requirements, or where the band may be subject to reallocation. The renewal process should be clearly specified either in the regulations or as part of the license's terms and conditions, and should be completed at least a year before the expiration of the license. Renewal expectancy is critical for giving licensees and investors confidence that they will be able to recoup their investments in equipment and infrastructure. If there is no reasonable expectation of renewal, as a licensee gets closer to the expiration of the license, they have less incentive to invest in further deployment or upgrades to existing equipment for fear that they will not be able to get all their money back before the license expires. As a result, users suffer with potentially declining levels of service.

In Bahrain, the Telecommunications Law (2002) directs that “an Individual Licence issued under this Law shall be renewed on the request of the Licensee, for a further limited term in accordance with the conditions of the Licence.”¹⁰⁸ Exceptions are permitted if the licensee has violated the license terms, but the regulator must give a clear reason if a renewal is denied.

There may be cases in which licenses are not renewed. If a licensee fails to meet its obligations – does not meet coverage obligations or does not pay applicable fees – or is found to be in violation of applicable regulations, the license may not be renewed. In such cases, a clear reason must be given and supported by the regulator. There may also be situations where all the licenses for a particular band are not renewed. If the spectrum is not being used, or used efficiently, the government may decide – based on a public consultation process – that the spectrum should be reallocated to a different use. Similarly, spectrum may need to be “refarmed” so that new uses can be made under existing allocations. In such cases, the licensees will need to be given sufficient notice that their licenses will not be renewed. Also,

¹⁰⁴ See <http://www.skmm.gov.my/Spectrum/Assignment-of-Spectrum.aspx>.

¹⁰⁵ Decision No 243/2012/EU, March 14, 2012, “Establishing a multiannual radio spectrum policy programme,” available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>.

¹⁰⁶ See <http://www.skmm.gov.my/Spectrum/Assignment-of-Spectrum.aspx>.

¹⁰⁷ See [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/DGTP-002-07-quebecor-Study.pdf/\\$FILE/DGTP-002-07-quebecor-Study.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/DGTP-002-07-quebecor-Study.pdf/$FILE/DGTP-002-07-quebecor-Study.pdf).

¹⁰⁸ See http://www.tra.org.bh/en/pdf/Telecom_Law_final.pdf, Article 30.

in cases where spectrum will be reformed, the regulator will have to decide if the existing licensees can reapply/compete to get a new license. For example, in several countries in Latin America, such as Brazil and Mexico, the regulator has initiated a process to reform spectrum for mobile use that was initially licensed to multichannel multipoint distribution service (MMDS) providers.

4.5.5 Spectrum fees

Applicable spectrum fees may be set by the government only through public consultation and generally should be limited to the amounts necessary to support government management and enforcement actions. There is a wide range of fees and how they are calculated varies from country to country. In many places, the amount of the fee is designed to cover the administrative costs of the regulator. Many countries also impose a spectrum use fee. These fees generally vary and are dependent on how much spectrum a particular licensee uses. Fees may be benchmarked against comparable countries.

In Singapore, IDA has a two-tier fee scheme, which includes an Application & Processing Fee and the Frequency Management Fee. The Application and Processing Fee is a one-time charge payable upon the grant (or renewal) of the license that covers the cost of IDA's assessment of the suitability of the frequency to be used for the intended application. The Frequency Management Fee is a recurring, annual fee designed to cover the cost of spectrum management, and is based on the amount of spectrum a licensee uses.¹⁰⁹ Malaysia adopted a similar dual-fee approach in its tender invitation for 3G licenses in 2005.¹¹⁰

The key to setting fees is that they are fair, transparent, and competitively neutral. Fees for similarly situated licensees should generally be the same; if two licensees have the same amount of spectrum and the same license terms and conditions, they should pay the same fees. As noted, having additional spectrum can lead to legitimately higher fees.

4.5.6 Non-discrimination

All licensees in a category of service should be subject to the same general terms and conditions and treated equally. Exceptions may be made for competition purposes (e.g., market dominance), provided that they are based on open and transparent consultation processes and well-defined metrics for determining the conditions under which license terms or applicable regulations may differ.

In 2012, the European Union established a multinational radio spectrum policy that Member States must take into account competition issues when granting spectrum licenses to firms. The EU prohibits the placement of a condition that unduly burdens a specific licensee's right to use its licensed spectrum. Discrimination leads to licensees receiving an undue competitive disadvantage and can create a barrier to entry for new services or applications, and hamper innovation and competition.¹¹¹

4.5.7 Coverage Obligations

In order to ensure that services are provided to all, coverage obligations are often made part of the terms and conditions of a license. These obligations may be defined in terms of population coverage, for example requiring a percentage of population to be covered by a certain date. In many European countries, coverage requirements are specified in terms of population covered over a period of five or seven years. Another method is to define increasing obligations over a series of years. In Nigeria, the

¹⁰⁹ See <http://www.ida.gov.sg/~media/Files/PCDG/Licensees/SpectrumMgmt/FreqAllocAssign/RSMP.pdf>.

¹¹⁰ See http://www.skmm.gov.my/skmmgovmy/files/attachments/3G%20round%20%20AIP_final.pdf.

¹¹¹ Decision No 243/2012/EU, March 14, 2012, "Establishing a multiannual radio spectrum policy programme," available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>.

Nigerian Communications Commission imposed essentially a population-based obligation on 900 MHz licensees by requiring them to serve a specific number of subscribers within a year, a number that then increased every two years, ending at the five-year mark. Obligations may also be defined by geography. For example, a certain percentage of land mass must be covered or certain cities, or towns, specified for coverage by a set deadline. In the Philippines, licensees were required to provide 3G services to 80% of Philippine towns and cities within five years of licensing. It is important to set realistic deadlines that licensees can achieve. Also, all similarly situated licensees should generally have the same obligations. There may be cases where universal access or service obligations may apply to an incumbent provider, however. Such provisions will need to be carefully constructed to ensure that competitive distortions are minimized and that such universal service providers are appropriately compensated for the additional levels of coverage required.

4.5.8 Technology Neutrality

The concept of technology neutrality was first introduced in the United States and has spread quickly throughout the world, so that most licensing is now done on a technology-neutral basis. Singapore has long supported technology neutrality.¹¹² The government should not specify, or have to approve, the types of technologies licensees use or the specific services they offer. In the past, governments often specified what type of technology or standard could be used in a specific band. In Europe, for example, the 900 MHz band was initially specified for use only by GSM technology. The problem with such specifications is that they can quickly become outdated; technology advances very rapidly and governments can struggle to keep up with the pace of development. Locking in a technology to a specific band will eventually not make sense as the technology becomes obsolete. Similarly, forcing licensees to go back to the government every time they want to upgrade or change technology can be very time consuming and can lead to inefficient spectrum use as older technologies continue to be used. This constraint was faced throughout Europe when migrating from 2G to 3G whereas in Latin America licensees were generally able to migrate without the need for new licenses. Conversely, allowing licensees the discretion to pick their technology allows them to upgrade as customer demand and market needs evolve. Such technology evolutions can be more easily planned and executed. And the government, which may not have the expertise and operational experience to make such decisions, is relieved of this burden.

In addition, there is a growing trend toward service neutrality, in which specific services are not required to be provided (nor are any legal services prohibited). Again, the goal is to give licensees the flexibility to determine how best to respond to what their customers want and what the competitive market demands. The goals of these complementary approaches are to maximize innovation and create conditions for the development of new services, reduce investment risks and stimulate competition among different technologies. Operators benefit because they can rapidly adopt technologies to upgrade their services to meet market demand. Consumers benefit because they gain access to new technologies and services quickly and perhaps at lower cost. Even in countries with a long history of specifying technology standards or tying such requirements to specific spectrum bands, such flexibility is increasingly the norm; technology and service neutrality is now one of the core principles of the EC radio spectrum policy program.¹¹³

¹¹² See <http://www.ida.gov.sg/Policies-and-Regulations/Code-of-Practice-and-Guidelines/Telecoms-Competition-Code.aspx>, section 1.5.5.

¹¹³ Decision No 243/2012/EU, March 14, 2012, "Establishing a multiannual radio spectrum policy programme," available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>.

4.5.9 Compliance

An important part of a regulator's duties entails monitoring licensees' spectrum use. Such monitoring serves three important functions by helping to determine spectrum efficiency (use and occupancy), compliance with applicable regulations (i.e., power levels) and license terms and conditions, and sources of interference. The Regulator should set up a comprehensive program to regularly monitor/audit licensees and spectrum users to ensure that the spectrum is being used to support the goals of the government, and can be used as an input to spectrum planning and future possible reallocation activities. It will also provide the basis for enforcement activities, if necessary.

In Bahrain, the Authority is empowered to monitor frequencies for enforcement purposes, and is required to do it on an objective, transparent, timely, and non-discriminatory basis.¹¹⁴ The ICT Authority in Mauritius has authority under section 18(1)(b) of the ICT Act 2001 (as amended) "to provide economic and technical monitoring of the information and communication industry in accordance with recognised international standard practices, protocols and having regard to the convergence of technology."¹¹⁵ Pursuant to this, the Authority is directed to ensure industry compliance with mandatory standards, including standards covering electromagnetic interference and health issues such as exposure to electromagnetic radiation.

4.6 Technical Standards

4.6.1 Standards development

In general, governments should defer to the private sector in the development of standards for telecommunications systems and equipment as the latter tends to have more technical expertise and resources to perform the work. In particular, distinctive national standards should not be substituted for internationally-accepted standards developed by formal international standards development organizations, such as the ITU and 3GPP, or regional groups (such as ETSI). The ITU has many Recommendations that cover a wide range of radiocommunication services, including International Mobile Telecommunications (IMT), while 3GPP focuses more narrowly on the development of the technical specifications for LTE and LTE Advanced technologies. The use of harmonized, internationally-recognized standards promotes speed of deployment/upgrade and realizes economies of scale and size, leading to lower prices. In fact, smaller nations routinely adopt, either formally or informally, radiocommunication equipment standards developed by other standards organizations, which is a cost-effective manner of designing a set of standards.

4.6.2 Equipment Certification

The government should set up a streamlined equipment certification framework to ensure that equipment can be approved for use quickly, while maintaining adherence to required technical standards. This certification process may be conducted by the Regulator or an authorized third party (e.g., a testing lab). Since in-country testing requires substantial resources in terms of setting up testing mechanisms and personnel, the Regulator should establish procedures for the mutual recognition of technical standards and certification of equipment to those standards by bodies outside the country.

Both Malaysia and the United States allow third parties to certify that radiocommunications equipment meets required standards and specifications. Malaysia's Communications and Multimedia (Technical Standards) Regulations 2000 specify in great detail the country's certification requirements and the

¹¹⁴ See http://www.tra.org.bh/en/pdf/Telecom_Law_final.pdf, Article 42.

¹¹⁵ See ICT Toolkit, available at: <http://www.ictregulationtoolkit.org/en/PracticeNote.2883.html>.

requirements to become a certifying agency.¹¹⁶ Similarly, the U.S. Federal Communication Commission (FCC) specifies which types of equipment may be certified by a Telecommunications Certification Body (TCB), which must be authorized by the FCC itself.¹¹⁷ For the Asian region, APEC-TEL developed the Mutual Recognition Arrangement (MRA), which is a multilateral arrangement between countries. The APEC-TEL MRA for Conformity Assessment of Telecommunications Equipment, which came into effect on July 1, 1999, facilitates the recognition of each other's conformity assessment results. The MRA for Equivalence of Technical Requirements, which was endorsed by the APEC Telecommunications Ministers on October 31, 2010, builds upon the MRA for Conformity Assessment by facilitating the recognition of equivalent standards or technical requirements and provides for a further reduction in the costs of conformity assessment. As soon as possible, Myanmar should consider participating in these agreements.

4.6.3 Radio Frequency ("RF") Emissions Standards

National regulations governing human (worker and end user) exposure to radiofrequency (non-ionizing radiation) emissions should be based on international standards, such as those promulgated by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) or IEEE. Many countries have adopted these international standards or used them as the basis for their own regulations. Australia, for example, used the ICNIRP standards in their 2002 RF electromagnetic energy radiation standards,¹¹⁸ as did New Zealand¹¹⁹ and Singapore,¹²⁰ as well as European countries. Using such standards will ensure that end users and operator employees are adequately protected from RF emissions, while allowing economies of scale to be realized. Stricter standards would require manufacturers to produce non-standard equipment, driving up costs and delaying equipment availability.

4.6.4 Compliance

Government should monitor that radiocommunication equipment adheres to relevant international standards and is functioning according to all regulations and license terms and conditions. This includes the right to inspect radiocommunication facilities to ensure that equipment is operating normally. Bahrain's Telecommunications Law grants the Authority specific rights to inspect equipment and associated documentation, with the aim of preventing interference.¹²¹

¹¹⁶ See <http://www.skmm.gov.my/Legal/Acts/Communications-and-Multimedia-Act-1998-Reprint-200/COMMUNICATIONS-AND-MULTIMEDIA-%28TECHNICAL-STANDARDS.aspx>.

¹¹⁷ See <http://transition.fcc.gov/oet/ea/procedures.html>.

¹¹⁸ See http://www.arpansa.gov.au/radiationprotection/Factsheets/is_rfStandard.cfm.

¹¹⁹ See <http://www.mfe.govt.nz/publications/rma/nes-telecommunication-facilities-user-guide/page2.html>.

¹²⁰ See http://app2.nea.gov.sg/about_crpns.aspx.

¹²¹ See http://www.tra.org.bh/en/pdf/Telecom_Law_final.pdf, Article 77.

5 Interconnection and Access Regulations

5.1 Introduction to Two-way and One-way Access

When discussing interconnection and access in telecommunications it is useful to make the distinction between “two-way” and “one-way” access. Two-way access occurs when service providers exchange traffic. The typical two-way access arrangement is two competing networks interconnecting to allow subscribers from one network to call subscribers of the other network. This type of two-way access covers the common usage of the term “interconnection.”

One-way access describes an arrangement in which one service provider acquires access to another’s facilities or services as an input to the access seeker’s service, which may occur without obtaining similar access in return. This is the case, for example, when a new entrant does not have the resources to replicate a national telecommunications provider’s network of local loops to subscribers’ homes and businesses, and seeks to lease these loops to possess a direct link between its customers and its core network. So defined, one-way access covers a variety of services, including call origination for long-distance or international calling, leasing national backbone transmission, local loop unbundling, co-location, and infrastructure sharing.

In this section, we will use the term “interconnect” to refer to two-way access and “access” to refer to one-way access.

5.2 Obligation to Interconnect

5.2.1 Mandatory interconnection

Making interconnection a mandatory obligation for dominant operators, as opposed to leaving it to voluntary negotiation, is essential for two reasons. First, it prevents firms with significant market power from using this power to exclude competitors or new entrants. Second, it reduces transaction costs and speeds up the interconnection of networks. Most, if not all, countries that have opened their telecommunications market to competition have laws mandating interconnection of networks.

We note that this mandatory nature of interconnection for dominant operators in international best practice generally refers to voice interconnection (although some data services, such as mobile short messaging service (SMS), are also regulated in some countries). Interconnection to ensure bilateral exchange of Internet traffic has generally not been required. This is generally due to the fact that voluntary negotiation has been satisfactory for most parties in most markets as a means of coming to an interconnection agreement. There are important exceptions to this generalization. For example, new entrants often argue that next generation network roll-out by the incumbents has made lower-cost IP interconnection possible. Furthermore, as the value of data traffic flows continue to accelerate over voice, and as more voice traffic is carried over IP, the case for regulating IP interconnection strengthens.

In Europe, the mandatory nature of voice interconnection is specified as an obligation to negotiate, and is backed up by the authority of the regulator to enforce interconnection when negotiation fails. Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 on access to, and interconnection of, electronic communications networks and associated facilities (the “Access Directive”)¹²² specifically requires that:

¹²² See the 2009 Access Directive at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0037:0069:EN:PDF>.

Operators of public communications networks shall have a right and, when requested by other undertakings so authorised in accordance with Article 4 of Directive 2002/20/EC (Authorisation Directive), an obligation to negotiate interconnection with each other for the purpose of providing publicly available electronic communications services, in order to ensure provision and interoperability of services throughout the Community.

In Malaysia, the obligation to interconnect was first developed in 1996 with the issuance of the *General Framework for Interconnection and Access*. Although commercial negotiations and agreement were given priority, the Framework sets out the objectives of regulatory intervention should negotiations fail. Among the objectives captured in the Framework was ensuring that any customer of a telecommunications network be able to communicate with any customer using another telecommunications network efficiently and without unnecessary impediments. The Framework effectively made interconnection obligatory. The Framework was replaced by a new regulatory regime created under the 1998 Communications and Multimedia Act. The Act does not specifically call for obligatory interconnection, but instead identifies interconnection and access as services that fall under standard access obligations in an access list.¹²³ The Act states that an industry body, the Access Forum, is responsible for recommending to the regulator which services are put on that list.

In the United States, the Telecommunications Act of 1996 imposes a general duty to interconnect on all telecommunication service providers (carriers). Specifically, section 251 imposes the duty “to interconnect directly or indirectly with the facilities and equipment of another telecommunications carrier.”¹²⁴

In India, Section 11(1)(b)(ii)-(iv) of the Telecom Regulatory Authority of India (TRAI) Act amended in 2000 (TRAI Ordinance 2000) gives the regulator, the TRAI, authority to intervene and ensure the interconnection of networks. It authorizes the TRAI to “fix the terms and conditions of interconnectivity between the service providers; (iii) ensure technical compatibility and effective interconnection between different service providers; and (iv) regulate arrangement amongst service providers of sharing their revenue derived from providing telecommunication services.”¹²⁵

In Australia, several parts of the regulations and laws authorize the Australian Competition & Consumer Commission (ACCC) to effectively mandate interconnection of all networks. The law, similar to the European Directives, favors a negotiated approach between the parties on the terms of interconnection. If negotiations fail, the law allows the ACCC to set the terms of interconnection.¹²⁶

The provisions related to interconnection in the Myanmar telecommunications law should clearly indicate that interconnection will be mandatory. Should the language in the Draft Telecommunications Law be enacted, to avoid unnecessary delays and costs, the Ministry should issue a policy statement to underscore how it expects to apply the law to effect the interconnection obligation, and regulations should state clearly under what circumstances interconnection is mandatory and not voluntary.

¹²³ See Chapter 3 of Part VI at <http://www.agc.gov.my/Akta/Vol.%2012/Act%20588.pdf>.

¹²⁴ See U.S. Telecommunications Act of 1996, <http://transition.fcc.gov/telecom.html>.

¹²⁵ See TRAI Ordinance 2000, available at http://www.dot.gov.in/Acts/TRAI_amendment_ACT.pdf.

¹²⁶ See for example the Telecommunications Legislation Amendment Act 2010, Part 2, Competition and Consumer Act 2010, section 114, <http://www.comlaw.gov.au/Details/C2010A00140/Download>. The 2010 Act repealed Section 152BR of the Trade Practices Act 1974 and the TAF Telecommunications Access Codes: <http://transition.accc.gov.au/content/index.phtml/itemId/723186>.

5.3 Additional Interconnection Obligations for Dominant Service Providers

5.3.1 Symmetric and asymmetric regulation

Interconnection regulations are said to be symmetric if they apply equally to all service providers regardless of whether they have significant market power. The current draft law suggests that symmetry is generally required. Section 44 requires that access and interconnection of any licensee must be on a non-discriminatory basis. Furthermore, Section 43 of the draft law requires that *all* interconnection and access agreements be approved by the Ministry.

In the United States, regulation is largely symmetric with respect to interconnection. Little distinction exists between the obligations placed on access providers with significant market power and the obligations placed on other providers as transparency and non-discriminatory obligations are imposed on all access providers. Incumbents have historically been burdened with certain reporting requirements that look a lot like interconnection-related obligations, e.g., accounting separation, but these often have different origins than interconnection regulation per se.

Symmetry with respect to interconnection is quite usual in international practice. Symmetry is consistent with the policy objective of achieving any-to-any connectivity, and it lowers the transaction costs associated with interconnection agreements.

Asymmetric regulation may be justified to compensate for the relatively weaker commercial and economic position of service providers that do not possess significant market power vis-à-vis the dominant service providers. In such cases, additional obligations for interconnection may be applied to the dominant carriers on an asymmetric basis. There are generally three types of additional conditions put on dominant service providers with respect to interconnection:¹²⁷

1. Non-discrimination
2. Transparency
3. Cost-orientation of rates

Absent non-discrimination provisions, a dominant firm could, for example, supply interconnection links to competitors at higher cost or lower quality than it supplies to itself. This would degrade the service quality of competitors and lessen their ability to compete fairly. Thus, non-discrimination is a particular concern where dominant providers are vertically integrated and supply services to others with whom they compete in downstream markets.

The principle of non-discrimination leads to specific economic and technical requirements for interconnection. For example, regulators will often specify accounting requirements for dominant providers to ensure non-discriminatory financial terms for interconnection. Similarly, the number and location of the points of interconnection (POI) are typically specified to avoid burdening new entrants or competitors with unnecessary network costs. Likewise, the technical standards of the interconnection links would need to be specified to ensure interoperability of networks for all service providers, as required by the non-discriminatory condition.

The transparency provisions are complementary to the non-discriminatory access provisions and are instituted to reduce the transaction costs of monitoring that the terms are indeed non-discriminatory. In addition, making the terms of these agreements public and non-discriminatory lessens the

¹²⁷ The conditions are also often imposed on dominant providers of other forms of one-way access as well. We address this below.

negotiation time needed between the parties and reduces uncertainty for new licensees regarding the terms of interconnection, all of which facilitates investment in telecommunications.

In India and Australia, the interconnection regimes are generally symmetric. No distinction exists in the obligations placed on access providers with significant market power compared to other providers. Transparency and non-discriminatory access principles are imposed on all access providers. We note that in these countries, interconnection agreements are not made public, but regulatory approval achieves many of the goals that publication is intended to achieve.

Regulatory authorities around the world also require dominant providers to publish standard interconnection and access agreements called a Reference Interconnection Offer (RIO) and Reference Access Offer (RAO). The RIO/RAO is in effect a further attempt to increase transparency and ensure that the terms of the agreements used by dominant providers are the same for all interconnecting parties (i.e., that they do not discriminate).

With respect to cost-orientation of rates, many countries have pursued a policy of requiring cost-based rates only of dominant service providers. In practice, many countries require cost-based rates of new entrants as well. This is due to the fact that incumbents will dispute excessive non-cost-based rates proposed by new entrants, or that the regulator has determined that all network service providers are dominant in the termination markets.

Regulation is also symmetric in Malaysia. All access providers are required to provide interconnection:

- of at least the same or more favorable quality as the quality provided on their own facilities and services;
- based on the same or more favorable technical standards;
- on an equitable and non-discriminatory basis; and
- via reference offers for these facilities and services, which are entered into a public registry.¹²⁸

In Europe, by contrast, interconnection regulation is asymmetric. Access providers with significant market power have additional obligations. These additional obligations – transparency, non-discrimination, and price control including cost orientation – were originally set out in Directive 97/33/EC. More recently, the Access Directive requires that national regulatory authorities establish that an access provider has significant market power before imposing such obligations. The EU does not specify which forms of transparency and non-discrimination are required of national regulatory regimes. However, it does identify a range of obligations that could be imposed as appropriately determined at the national level. For example, with respect to transparency, the Directive states:

Transparency of terms and conditions for access and interconnection, including prices, serve to speed-up negotiation, avoid disputes and give confidence to market players that a service is not being provided on discriminatory terms. Openness and transparency of technical interfaces can be particularly important in ensuring interoperability. Where a national regulatory authority imposes obligations to make information public, it may also specify the manner in which the information is to be made available, covering for example the type of publication (paper and/or electronic) and whether or not it is free of charge, taking into account the nature and purpose of the information concerned.

¹²⁸ More details on these obligations can be found at <http://www.mafb.com.my/pdf/MSA%20%20and%20Determination%20of%202005.pdf>.

With respect to non-discrimination, it states:

The principle of non-discrimination ensures that undertakings with market power do not distort competition, in particular where they are vertically integrated undertakings that supply services to undertakings with whom they compete on downstream markets... Accounting separation allows internal price transfers to be rendered visible, and allows national regulatory authorities to check compliance with obligations for non-discrimination where applicable.

5.4 Access Obligations Beyond Voice Interconnection

5.4.1 Case-by-case analysis for access obligations

Requirements for interconnection are justifiable to ensure any-to-any connectivity. While regulatory intervention to ensure two-way access (interconnection) is virtually universal and often symmetric, intervention to ensure one-way access is not. Generally one-way access becomes an issue where the access provider and access seeker compete in a 'downstream' market, i.e., in a market for which the access facility or service is an input to the services provided in the market in which the two parties compete. Thus, requirements for one-way access generally require some consideration of whether the service or facility is truly only available from access providers and cannot be easily replicated.¹²⁹ Regulators may choose not to mandate access even where in the short or medium-term facilities are not replicable in order to encourage competitive infrastructure roll-out.

Thus, best international practice requires some decision-making process to weigh the costs and benefits of access regulation in particular markets. If the benefits outweigh the costs, then the terms and other implementation characteristics, such as the basis pricing of the service or facility in question, must also be determined.

In Europe, Article 8 of the Access Directive instructs regulatory authorities to impose mandatory access obligations only on operators having significant market power. In such cases, Article 12 states that regulatory authorities may require providers to:

- a) give third party access to specific network elements and/or facilities, including unbundled access to the local loop;*
- b) negotiate on good faith with undertakings requesting access;*
- c) not to withdraw access to facilities already granted;*
- d) provide specified services on a wholesale basis for resale by third parties;*
- e) grant open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of services or virtual network services;*
- f) provide co-location or other forms of facility sharing, including duct, building or mast sharing;*
- g) provide specified services needed to ensure interoperability of end-to-end services to users, including facilities for intelligent network services or roaming on mobile networks;*

¹²⁹ There are also cases in which access will be required, particularly infrastructure sharing, in order to address concerns other than replicability such as reducing environment impacts and minimizing costs of network rollout to the industry overall.

*h) provide access to operational support systems or similar software systems necessary to ensure fair competition in the provision of services.*¹³⁰

In Malaysia, as indicated elsewhere in this section, the list of access services and facilities is recommended by an industry body and then confirmed by the regulator. Unusually, access to services and facilities are required of all market players; the regulation makes “no distinction between large or small providers, nor does it distinguish between established or new providers.”¹³¹ However, the selection of which services are mandated for access are considered on a case-by-case basis.

In the United States, consideration of what facilities and services beyond interconnection may be mandated and the terms and conditions of that mandate are also treated on a case-by-case basis. These mandates may evolve over time. For example, the United States pursued local loop unbundling under Section 251 of the Telecommunications Act, requiring for many years that local incumbent service providers supply any access seeker “nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory.”¹³² The unbundling mandate required the regulator to determine whether access to those elements was “necessary” and whether the failure to provide access to those elements would “impair” the requesting service provider’s ability to provide the services that it sought to offer. More recently, the United States has backed away from this unbundling mandate with the regulator effectively deciding that lack of mandated access did not cause such impairment.

In Australia, the ACCC plays the central role in determining which services and facilities are mandated and how. It determines which services are subject to standard access obligations and to whom these obligations apply. It also approves the terms and conditions of regulated access agreements, and requires that they be registered. Significantly, it can only mandate access via a public inquiry that assesses whether access is necessary in order to ensure effective competition.

In India, public proceedings take place to determine whether specific services and facilities are required to be mandated in the interest of competition. Cable landing stations, for example, were deemed essential facilities under TRAI regulations in 2007. Although today the number of cable landing stations number nine (up from six in 2007), the TRAI continues to regulate access prices in the interest of keeping international voice and data prices down and increasing service competition in the international bandwidth market. Operators of cable landing facilities are required to supply international bandwidth capacity in the cable landing facility to access seekers in a transparent and non-discriminatory manner. Cable landing operators are also required to supply access seekers a backhaul circuit to connect the access seeker’s facilities to the international gateway. In addition, they are required to supply collocation space in the cable landing site to access seekers in a transparent and non-discriminatory way. The pricing of access and collocation space is based on costs and regulated by TRAI under a Cable Landing Station Reference Interconnection Offer.¹³³

¹³⁰ Access Directive 2002/19/EC of the European Parliament and of the Council of March 7, 2002. See Annex II of Directive for a more detailed list to be included in the reference offer for unbundled access to the local loop.

¹³¹ The complete list of services is found at http://www.skmm.gov.my/skmmgovmy/files/attachments/CommDeter_AccessList_2005.pdf.

¹³² Section 251 also mandates incumbent local exchange carriers to grant access to the poles, ducts, conduits, and rights-of-way of such carrier to competing providers of telecommunications services on rates, terms, and conditions that are just, reasonable, and non-discriminatory.

¹³³ TRAI, International Telecommunications Access to Essential Facilities at Cable Landing Stations Regulations, 2007 (June 7, 2007), http://www.trai.gov.in/Regulation_Version.aspx?REG_ID=146&id=0&qid=1.

5.5 Dispute resolution, and timeframe for interconnection and access

5.5.1 Clear, timely procedures with independent review

International best practice is to provide clear procedures and an efficient process for dispute resolution. It is generally not sufficient to simply describe the powers of the regulator. Regulations must also set out the procedural rights and obligations of the parties to the dispute. Because interconnection is such a critical element of market entry and competition, specifying timeframes for addressing disputes is important. In many countries, there are timeframes for when a resolution process is triggered if agreements are not being reached, as well as timeframes within which the dispute must be resolved.

In those cases that specify timeframes within which a dispute resolution process is triggered, a period of two to three months from an access provider receiving a request is typical. In many cases the dispute resolution process can substitute for specific timeframe requirements for concluding access agreements. Thus, although not every country imposes timelines to reach an access agreement, most, if not all, jurisdictions include clear provisions for dispute resolution.

The European Union's Framework Directive does not exactly impose a strict timeframe, but instructs regulatory authorities in member states to resolve interconnection disputes at the request of either party in the "shortest possible time frame and in any case within four months except in exceptional circumstances."¹³⁴ Decisions of the national regulators in Europe are subject to judicial review.

In Malaysia, there is not a specified timeframe; however, a party to a dispute over compliance with any standard access obligation may notify the Commission of the dispute under Chapter 7 Part V, which is its generic dispute resolution procedure. The Malaysia regime also specifies a series of special intermediate procedures to resolve interconnection access disputes before the issue comes before the Commission.¹³⁵

In the United States, at any point in time during an interconnection negotiation, a party can request mediation by a State Regulatory Commission. If mediation does not resolve the dispute, a party may request compulsory arbitration by a State Regulatory Commission at any time between the 135th and the 160th day after an incumbent local carrier receives a request to negotiate an interconnection agreement. The State Commission then has nine months to resolve the dispute after the local exchange carrier received the request for interconnection.¹³⁶ Decisions of the State Commissions (and the Federal Communications Commission (FCC)) are subject to judicial review.

In Australia, the ACCC has discretion on setting an appropriate length for an arbitration, but must make a determination within a set time. The Commission's determinations are subject to review by the Australian Competition Tribunal (ACT). An aggrieved party may request a review of the Commission's determination in writing to the ACT within 21 days of such determination. A review by the ACT amounts to a re-arbitration of the access dispute. A party to an arbitration of the ACT may appeal to a Federal Court on a question of law within 28 days of a decision.¹³⁷

¹³⁴ See Article 20 of the European Union Framework Directive 2002/21/EC of March 7, 2002, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0033:0033:EN:PDF>.

¹³⁵ See http://www.skmm.gov.my/skmmgovmy/files/attachments/Mand_Std_Access_List2_2005.pdf.

¹³⁶ Telecommunications Act of 1996, Section 252, <http://transition.fcc.gov/telecom.html>.

¹³⁷ See Part XIC, Division 8-Resolution of disputes about access, Trade Practices Amendment (Telecommunications) Act 1997.

The TRAI (amendment) Ordinance, 2000, established the Telecom Disputes Settlement and Appellate Tribunal, which was set up to adjudicate disputes between service providers including, but not limited to, interconnection disputes and to resolve appeals of TRAI decisions. This tribunal has the same powers as a civil court, but its functions are limited to adjudicating telecommunications-related disputes.¹³⁸ The Ordinance does not state a timeframe for the interconnecting parties to finalize negotiations. Nevertheless, once a party files an application to adjudicate a dispute (or an appeal to a TRAI decision) to the Tribunal, the Tribunal should resolve the matter within 90 days, or alternatively explain why it needs more time. In appeals of TRAI decisions, the aggrieved party should file the appeal within 30 days of the issuance of a decision.¹³⁹ The tribunal's decisions can be appealed to the Supreme Court.

Furthermore, international best practice suggests that if one or more parties to a dispute does not agree with the decision of the regulator, an independent avenue for appeal is possible. In the current draft of the Myanmar law, determinations made by the regulator and the Ministry are subject to appeal, but only to a tribunal set up by the Ministry itself (Sections [52-56]). This does not constitute independent review.

¹³⁸ The tribunal however, does not adjudicate disputes related to the monopolistic trade practice, restrictive trade practice and unfair trade practices.

¹³⁹ See Chapter IV, Telecom Regulatory Authority of India (amendment) Ordinance, 2000.

6 Access Price Regulation

6.1 Introduction

Where an access provider has significant market power, a probability exists that it will act anticompetitively to the disadvantage of access seekers if left to freely negotiate the terms of interconnection and access. Because the pricing of access is perhaps one of the most important terms of interconnection, it is quite standard that law or regulations spell out an acceptable basis for setting access prices.

Where no market power exists, a market-determined basis for pricing is usually acceptable. Thus, in markets recognized as competitive, international best practice holds that their prices should not be regulated. At most, such services may fall under notification requirements, which require prices to be published on the service provider's or regulator's website, or otherwise made available to the public.

Where the market is not competitive or the facilities in question are not easily replicable, an alternative approach to access pricing must be adopted. Best international practice suggests that this approach should seek to mimic what an efficient market would deliver, i.e., one which bears some relation to the cost of providing the service or facility. As discussed in more detail below, there are a number of bases on which a dominant provider's prices for access may be set. For a summary, see Table 7 on page 56.

6.2 Compensation under two-way access – "LRIC or lower"

Under two-way access, the interconnecting parties pay one another for traffic exchanged. Under a balanced exchange of traffic, no explicit price need be charged because traffic is exchanged in kind. However, because traffic is rarely balanced between two interconnecting networks and/or the price varies by the type of traffic exchanged, one party is generally a net receiver of interconnection revenue, the other a net payer in any given payment cycle.

The most dramatic example of this imbalance in recent years is the flow of payments between fixed and mobile operators, where mobile operators are the net receivers. The imbalance is driven by two factors. First, the traffic destined for fixed networks (fixed termination rates) tends to be priced lower than traffic destined for mobile users in wireless networks (mobile termination rates) because the costs of mobile termination are generally accepted to be higher than fixed termination. Second, given the high incidence of fixed to mobile call substitution and the faster growing market for mobile services, traffic flows between the different types of networks are not balanced.

Payment imbalances mean that interconnection cash inflows can be a significant source of net revenue to some firms, so setting the right price of interconnection becomes important. If the cost-basis is not correct, these payments become a source of unfair subsidy.

Further, pricing interconnection above cost can have a distorting impact on retail pricing, e.g., it may underpin sharp differences between on-net and off-net pricing. These distortions can in turn lead to inefficient consumption, e.g., buying service from more than one service provider simply to minimize off-net usage, and the lessening of competition.

There are several systems for two-way interconnection compensation. The most common are (a) Calling network party pays (CNPP) and (b) Bill and keep (BAK).

Under CNPP, the network that originates a call that terminates on another network pays a termination charge to that terminating carrier. The CNPP system is by far the most prevalent system worldwide. It

mirrors the most prevalent *retail* billing relationship – one in which the subscriber pays for the calls he or she originates.

Under CNPP, for the reasons discussed above, international best practice is that rates are cost-oriented. This suggests the use of approaches numbered 1-3 in Table 7. Under long-run incremental costing, for example, the price of access is set through an estimation of the forward-looking long-run costs of providing an increment of the service or facility provided. Incremental costing typically requires the development of a complex model to identify the relevant costs. The complexity of the model is driven in large part by the fact that they require costs to be explicitly driven by volumes of service. These can be done on a “bottom-up” engineering basis, or via cost-volume relationships derived from activity analysis and financial records associated with “top-down” models. Long-run Incremental cost results can vary widely depending on a number of factors, including the size of the increment measured. “LRIC+” models typically identify an increment of all traffic carried on the network and “marks-up” the costs of carrying that traffic with an amount to cover common costs. In “pure LRIC” models, only the costs of interconnection traffic increments are deemed relevant, and common costs are excluded.

European countries use the CNPP system of interconnection compensation using cost-based pricing. The cost standard used historically has been LRIC+. Recently there has been increasing interest in “pure” LRIC rates. Belgium, Italy, Spain, Portugal, Sweden, and the United Kingdom, among others, have introduced pure LRIC-based MTRs, and more countries are expected to follow this approach in coming years. In Malaysia, there is a CNPP system, and the Commission determines prices for fixed and mobile origination and termination services on the basis of LRIC+. Australia also uses the CNPP system of interconnection compensation using cost-based pricing; the cost standard used is forward-looking LRIC+. ¹⁴⁰

Fully allocated cost bases are sometimes found in jurisdictions transitioning to an incremental cost-based approach. Although there are instances in which fully allocated costing may produce relevant cost figures relatively quickly – as the underlying cost allocation mechanism may be simpler than an incremental cost model and the inputs tend to be drawn from historic company financial accounts and activity reports, fully allocated costing suffers from a number of inadequacies as indicated in Table 7 below.

India uses the CNPP system of interconnection compensation using cost-based pricing. The cost standard used is Fully Allocated Cost (FAC) using historical costs. While this cost standard is not (yet) considered international best practice, the regulator’s application of the FAC reduced termination rates to around 0.5 cents of U.S. Dollar in 2009 and sets India apart from many countries that struggle with high termination costs. Interconnection compensation is symmetric, meaning that termination charges are the same for fixed and mobile networks. ¹⁴¹

¹⁴⁰ Australian Competition & Consumer Commission. “Inquiry to make a final access determination for the domestic mobile terminating access service (MTAS).” Access determination explanatory statement. Dec. 7, 2011. <http://transition.accc.gov.au/content/index.phtml/itemId/848724>.

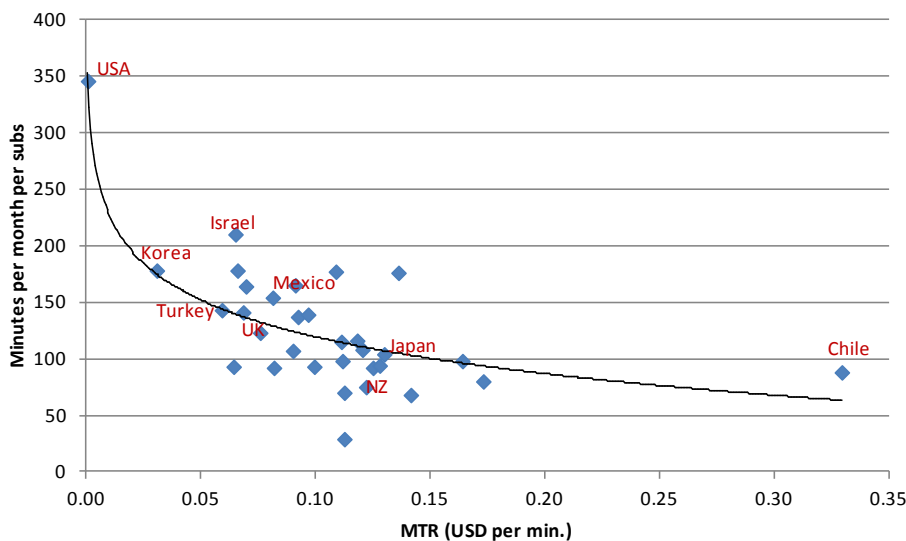
Australian Competition & Consumer Commission,. “Access Pricing Principles: Telecommunications a guide”, 1997) <http://transition.accc.gov.au/content/index.phtml/itemId/324346>.

¹⁴¹ See TRAI, The Telecommunication Interconnection Usage Charges (Tenth Amendment) Regulations, 2009 (2 of 2009), New Delhi (Mar. 9, 2009), File No. 409-12/2008-FN; TRAI, “Consultation Paper on Review of Interconnection Usage Charges,” Consultation Paper No. 4/2011 (Apr. 27, 2011), New Delhi, <http://www.trai.gov.in/WriteReaddata/ConsultationPaper/Document/cp-27apr2011.pdf>.

Benchmarking can be a low-cost means of generating cost-oriented prices for interconnection and access. With benchmarking, the prices of comparable services in other jurisdictions are used to set access prices. Best practice in benchmarking requires that the prices selected for the benchmark be based on a legitimate cost standard and that relevant cost-related characteristics (e.g., economies of scale, labor, and capital cost differences) are taken into account to adjust for differences in local conditions.

An alternative to CNPP is BAK which was historically prevalent in those markets where mobile networks charged their customers for both originating and receiving calls. Under BAK, each network covers its termination costs from its customers, and no payment is made between the interconnecting networks. This is the arrangement used in the United States and some Asian countries for most interconnection with mobile service providers. In recent years, there has been more interest in BAK or other approaches that significantly reduce cost-basis of interconnect, such as “pure” LRIC. This interest is due to a number of concerns. Evidence shows that lower termination rates are correlated with increased usage of retail services. For example, Figure 3 shows that countries with lower mobile termination rates tend to have higher usage of mobile service when measured by minutes of use.

Figure 3: Mobile minutes of use versus mobile termination rates (MTRs)



Source: OECD, “Developments in Mobile Termination,” OECD Digital Economy Papers No. 193 (2012: page 17).

The United States uses a mixture of CNPP and BAK systems for interconnection compensation, which had resulted in one of the lowest (wholesale) interconnection prices in the world. The United States is transitioning more fully to BAK as a result of the FCC ICC/USF Order of November 2012.¹⁴²

The table below summarizes these approaches and their associated advantages and disadvantages.

¹⁴² *In re Connect America Fund, et al., Report and Order and Further Notice of Proposed Rulemaking*, FCC 11-161, (rel. Nov. 18, 2011).

Table 7: Pros and Cons of Price Setting Options

#	Price Setting Basis	Pros	Cons
1	<i>Long-run Incremental Costing</i> (variations include “bottom-up” and “top-down”; “pure LRIC” and “LRIC+”)	<ul style="list-style-type: none"> • Cost causality explicitly modeled • Efficiency may be core attribute of modeling (bottom-up) or introduced through adjustments (top-down) • Best practice in developed world 	<ul style="list-style-type: none"> • Modeling is complex • Modeled costs may diverge from actual costs • Reconciliation with financial accounts difficult
2	<i>Fully allocated Costing</i> based on financial accounts (variations include historic or current cost accounting)	<ul style="list-style-type: none"> • Modeling effort relatively light • Based on available cost • Allows recovery of actual costs 	<ul style="list-style-type: none"> • Inefficiencies embedded • Cost may not be causally linked with services • Accounting values do not necessarily equal economic values • No credit for fully depreciated assets • Accounting records may be poor
3	<i>Benchmarking</i>	<ul style="list-style-type: none"> • No modeling required • Can be scoped to achieve different policy objectives, e.g., consistent with regional practice, consistent with recent LRIC studies, etc. 	<ul style="list-style-type: none"> • No cost causality explicitly identified, which may mean that, even if benchmarks are cost-based, rates may diverge from actual costs
4	<i>Sender keeps all or Bill and Keep</i> (for two-way access)	<ul style="list-style-type: none"> • No modeling required • Extremely easy to implement 	<ul style="list-style-type: none"> • No relation to cost unless traffic balanced
5	<i>Retail minus</i> ¹⁴³	<ul style="list-style-type: none"> • No modeling required • Easy to implement 	<ul style="list-style-type: none"> • May bear no relation to cost • Only appropriate where a retail service exists
6	<i>Revenue-sharing</i>	<ul style="list-style-type: none"> • No modeling required • Easy to implement 	<ul style="list-style-type: none"> • May bear no relation to cost

6.3 Compensation under one-way access – Cost-orientated pricing

As mentioned above, generally one-way access becomes an issue where the access provider and access seeker compete in the same ‘downstream’ market. For example, a vertically integrated access provider which operates a single national backbone and also provides retail broadband Internet services could set

¹⁴³ A version of retail-minus is the efficient component pricing rule (ECPR). The ECPR equals the opportunity cost to the access provider of any loss of customers to the downstream firm.

the price of access to the backbone so high that an equally efficient downstream rival (and independent ISP) could not operate profitably in the long term. This case is often referred to as an anticompetitive price squeeze (or margin squeeze).

While generic competition provisions established by law may provide *ex-post* remedies for this type of anticompetitive behavior, many regulatory authorities have instituted *ex-ante* pricing safeguards to prevent this behavior. Although retail-minus and revenue-sharing models are found throughout the world, international best practice suggests that cost-orientated pricing is the best approach for market development. As indicated in Table 7 above, cost-orientated prices may be achieved via a number of approaches: fully allocated, incremental cost pricing and benchmarking costs.

In the European Union, access charges are generally estimated based on LRIC+ models. However, for certain services (e.g., domestic leased lines) EU-wide benchmarking has been used to drive regulators to bring prices into line. In Malaysia, the Commission has historically favored LRIC+. However, it is moving to a building-block methodology for fixed access services. The building-block methodology is essentially a fully allocated cost methodology, which estimates an efficient cost-base or revenue requirement for the service, which can be revised over time without repeated complex modeling.¹⁴⁴ In Australia, LRIC+ has been used to set cost-based rates for access. However, for certain access services,¹⁴⁵ the ACCC is beginning to consider a building-block approach.¹⁴⁶

U.S. legislation foresees a number of different price approaches. For unbundled loops, LRIC+ has been used. Section 252 of the Telecom Act foresees the prices of certain services determined by the retail-minus approach. In New Zealand, the Commerce Commission determined that benchmarking against the price of terminating a voice call in comparable countries where the price calculation is based on a forward-looking cost-based pricing method was a reasonable initial price-setting principle in advance of a more robust LRIC modeling exercise.

Whereas regulators have sought causes and means for lowering the cost basis for two-way access to a level below LRIC+ (as discussed above) in recent years, they have not done so for one-way access. This hesitancy is explained by three factors:

- Two-way access is an exchange for which both parties benefit to a lesser or greater degree, even in the absence of a pricing mechanism. This exchange does not exist with one-way access.
- Actual observed retail pricing suggests that network service providers discount the costs of providing interconnection services below LRIC+ rates, i.e., on-net prices can sometimes be significantly lower than what LRIC-based termination rates would suggest they should be. One-way access providers have fewer opportunities to let the market reveal actual costs.
- Pricing of one-way access below cost more clearly risks discouraging investment in facilities.

¹⁴⁴ See <http://www.skmm.gov.my/Resources/Reports/Public-Inquiry-Report/Public-Inquiry-Report-on-Review-of-Access-Pricing.aspx>.

¹⁴⁵ These include unconditioned local loop service; wholesale line rental; line sharing service; public switched telephone network originating access; public switched telephone network terminating access; and local carriage service.

¹⁴⁶ See <http://transition.accc.gov.au/content/index.phtml/itemId/904344>.

7 Numbering

Numbering has long been recognized as a key issue in market liberalization. For example, when the telecommunications sector in the European Union countries was being liberalized, the EU Green Paper on the liberalization of telecommunications infrastructure published in 1995 referred to numbering as being *“a key facilitator - a pivot in market liberalisation and the introduction of competition.”*¹⁴⁷

In Myanmar, as in virtually all countries prior to market liberalization, the management and operation of the National Numbering Plan has hitherto been undertaken by the incumbent operator, MPT. Under this arrangement, MPT has acted on behalf of itself, its customers, and more generally, in the national interests for matters such as numbering coordination with the ITU. While this arrangement was satisfactory in a monopoly environment, in moving to a competitive market, with multiple providers, it is necessary that the numbering scheme is administered independently of any operator.

Further, with the introduction of competition, both the quantity of numbers in use and the range of services that have to be supported within the numbering plan are likely to grow significantly. In many newly competitive jurisdictions, this growth rate has far exceeded the historical growth trend in the number of subscribers over the same time period.

In addition, with competition, there will be new entrants in the market. These new operators will require access to individual numbers and to new numbering ranges of equal quality and with equal opportunity as has previously been enjoyed solely by MPT. A consequence is that in most other jurisdictions post-liberalization the numbering plan experienced shortages of capacity and therefore required some reform, i.e., numbering plan changes.

For example, over the period in which sector liberalization has taken place, the national numbering plans have undergone significant change in virtually all European countries, as well as the United States, China, Hong Kong, Japan, Malaysia and many other countries.

In planning these changes, best practice requires that any amendments to the plan should be designed both to create additional capacity and to increase future flexibility to allow the unhindered development of the National Numbering Plan into the long term future. One key aspect of flexibility is to retain unused digits (in particular one or more initial digits) to give potential expansion space for long term development.

Moving forward to liberalizing the telecommunications market within Myanmar, both the availability of adequate numbers, and the allocation of numbers on a fair, transparent and non-discriminatory basis are essential conditions for enabling effective competition, innovation, and consumer choice. In the transition to full market competition, numbers will become as important a resource as frequencies or rights of way.

In considering changes to the numbering scheme, while it would be very easy to design a new numbering scheme and take advantage of all of the latest user requirements, allocation arrangements and network technology capabilities, in practice, every country's numbering scheme is significantly constrained by the need to evolve gracefully from the existing plan. In many cases changes are more constrained by the historical implementation of the numbering scheme than by any other reason. It is unfortunately unrealistic to throw away the existing scheme and start again. As a result every national

¹⁴⁷ “Green Paper on the Liberalisation of Telecommunications Infrastructure and Cable Television Networks,” COM(94) 682, January 1995.

scheme is different, and thus while there are some common trends there are still significant differences between the numbering schemes that are in use today in each country.

7.1 Numbering Plan structure

In a competitive market, the overall numbering plan will have to support a variety of different number ranges. These are discussed in the following sections.

7.1.1 New geographic numbers

While it would be theoretically possible for a new operator to have a unique “branded” part of the national numbering scheme, the experience from other countries shows best practice to be that

- a. all providers share the same geographic codes, and
- b. individual operators are allocated unbranded numbering blocks (in sizes of typically 1,000 or 10,000 consecutive numbers) within each area in which they wish to provide local service. These blocks are required specifically in those areas having new fixed access networks. This can be a problem where there are insufficient remaining allocations for new allocations to be made, and in these cases this requires numbering changes within these areas.

Many national numbering changes have resulted solely from the need to enhance geographic capacity. For example in the United States many more area codes were released by allowing the middle digit of the three-digit Numbering Plan Area (“NPA”) area code to take any value, when formerly only 0 and 1 were available for use. Geographic capacity has also been a driver of changes in many other countries, for example in Australia, France, Germany, Spain, and Switzerland.

In most places the geographic area codes have a maximum subscriber number length of seven digits which is sufficient except for the very largest conurbations. Thus, for example, London, Paris, Tokyo, and Beijing have moved to 8-digit local numbers. Other large conurbations that have retained seven-digit local numbers, such as the cities in North America, have been forced to introduce new codes by either splitting or overlaying codes to satisfy capacity needs.

7.1.2 Mobile numbers

Two best practice issues arise in mobile numbering: the branding of mobile numbers, and the allocation of capacity to different operators within the overall mobile range.

In almost all countries mobile numbers are clearly distinguished from other numbering ranges.¹⁴⁸ In over half of all countries, specific first significant digits are used for mobile indicators, and in most of the remainder, specific second digits are used, often either 0 or 1.

There is no unambiguous best practice as to which digits should be used as mobile indicators. Thus, while all possible digits are in use in different countries of the world as the first significant digit to distinguish mobile numbers, the most common digits in use for mobile identifiers are the digits 6, 7 and 9.

Only a few countries (for example Canada, Mexico, and the United States) use no particular digit to distinguish mobile numbers, which are integrated into the national numbering ranges. This practice complicates the implementation of tariffs that differentiate between calls to geographic numbers and

¹⁴⁸ For detailed country examples see “Access codes/numbers for mobile networks according to ITU-T Recommendation E.164” (11/2010).

calls to mobile numbers. Thus, the best practice is clearly to include mobile identifiers in the first or, in the worst case, the first and second digits.

The second issue concerns the allocation of mobile numbering capacity to individual mobile operators. Here the best practice is that individual operators are allocated contiguous blocks of numbers, typically with a size of 1 or 10 million, i.e., six or seven digits long, but that these numbering ranges remain unbranded, either by the network operator or technology.

The rationale for not branding the numbers is that a calling customer does not need to know the serving operator of a called subscriber. Further, with number portability any such branding would automatically disappear within the numbering range.

7.1.3 Specially tariffed numbers

These are required for distinctly tariffed services such as freephone, shared cost services, and premium rate services. Best practice as indicated by the deployment in most jurisdictions is that all specially tariffed service providers share nationally recognized codes that are not operator-specific.

Freephone services almost always use the de facto standard of 800 or 80 (supplemented, for example, in the North American Numbering Plan by other codes such as 888, 877, 866 etc.). In some countries additional codes or parts of the code may be used for particular types of services.

Best practice analysis shows that premium rate services typically use the 90, 900, or 6X ranges. In some countries additional codes or particular parts of the code may be used to identify particular types of services such as adult content services.

Shared cost services show great variability in the numbering range used; therefore, it is more difficult to identify an unambiguous best practice. Many countries use the 8X range. However, considerable variation exists; for example in Australia the 13X range is used.¹⁴⁹ In some cases, different parts of the range distinguish different tariff values; often the higher numbers have higher tariffs.

Personal numbers typically use the 878 range, which is equivalent to 'UPT' on an alphanumeric keypad. However, other codes are also in use, like 700 in the United Kingdom.

Nationwide numbers, which allow tariffing independent of location, are also in use, but there appears to be no commonality as to which codes are used across the world. Examples of such codes include Austria (720), Finland (71), Switzerland (51), and United Kingdom (345).

For services delivered over a mobile platform, short codes (short numbers) are widely used, in particular for SMS messaging. These short numbers are used for value-added services such as television program voting, advertising campaigns responses, and charity donations. Short codes are designed to be easier to recall and use than normal numbers and often are tariffed at a premium rate. The numbers in use typically are specific to each operator, although in some jurisdictions operators have mutual agreements to avoid overlaps and in some cases short numbers are inter-operator. There is, however, no uniformity in short codes, as noted in Box 4.

¹⁴⁹ For example see "Telecommunications Numbering Plan – 1997 as amended 4 January 2008" ACMA Australia.

Box 4: Comparison of use of short codes in various countries

- Australia: short codes are six and eight digits long starting with the prefix “19”
- Canada: common short codes are five and six digits long
- France: short codes are five digits long with the leading digit defining the cost of the service
- India: short codes are five digits long beginning with the digit “5” and can contain three further digits to allow additional information to be delivered
- United States: inter-operable short codes are five and six digits long, with shorter codes used for operator specific services.

7.1.4 Carrier selection codes

Where emerging operators wish to offer arbitrage long distance and international call services (without providing local access), carrier selection codes are required to allow customers to choose to route long distance and international calls through particular operators. Best practice suggests that for carrier selection codes to be successful, the codes need to be both short and memorable, like 112 or 007. Carrier pre-selection obviates the need for such codes.

The emergence of carrier selection is patchy since it depends on the arbitrage opportunities between wholesale and retail tariffs. Where both trend towards cost, the arbitrage opportunity starts to disappear.

7.2 Overall numbering plan structures

Since every National Numbering Plan is different, best practice trends are hard to discern, and may not be appropriate in any other particular case. Nevertheless, within the European Community, specific recommendations were made on the structure of the numbering plans for the codes in preparation for the introduction of competition.¹⁵⁰ The key elements are shown in Box 5.

Box 5: Review of national numbering plans on their openness to competition proposals

- NSNs starting with digits 6 and 7 should preferably be used for the numbering of mobile and personal communications services.
- NSNs starting with X0 where X = 1 to 9 should preferably be reserved for the numbering of commonly recognized future services.
- NSN range 800 should preferably be reserved for freephone services. Range 80X should be reserved for future use, for example, for expansion and for service differentiation.
- NSN range 900 should preferably be reserved for shared revenue services. 90X should be reserved for future use, for example, for expansion and for service and tariff differentiation.
- In open numbering plans, NDC range 1 should preferably be left free for future expansion of the plan, to allow easy migration from an open numbering plan to a closed numbering plan.

¹⁵⁰ See “Review of national numbering plans on their openness to competition” ECTRA Report 48378.

7.3 Numbering capacity

Numbering schemes should have enough capacity to support present and future services and subscribers, capacity for geographic and non-geographic numbers including mobile and personal numbers, capacity for carrier access codes and short numbers and service access codes.

This need to ensure sufficient capacity in the numbering scheme for current and future requirements is a fundamental duty of the numbering scheme manager in order for the development of telecommunication services to not be constrained by lack of numbering resources. Again, best practice will depend upon the particular numbering plan's historic implementation, but typically there are four different measures of numbering capacity which should be considered:

- capacity for numbering subscribers to geographic services;
- capacity for numbering subscribers to non-geographic services;
- free NDC capacity for new services; and
- capacity for short codes.

Shortage in any one or in any combination of these measures can lead to the exhaustion of numbering resources. Further, in expanding overall numbering capacity, it is important to strike the right balance between the four measures. For example, it may be relatively easy to produce significant increases in capacity in one or two of the measures at the expense of inadequate increases in the other measures.

There are no firm quantitative rules on when a numbering scheme is reaching exhaustion. However, the European Telecommunications Office (ETO) has produced guidelines¹⁵¹ to indicate both when a numbering scheme is likely to be reaching exhaustion and the level of expansion that should be targeted when making a change. These can be summarized as follows:

- A numbering plan in which the usable geographic space has fallen below one number per person is in danger of exhaustion.
- When carrying out changes to the numbering plan, it is sensible to increase geographic capacity to at least three usable numbers per person.
- Countries in which the numbering space available for specially tariffed services is below two numbers per person should consider a major review.
- A major change should make at least five numbers per person available for specially tariffed services.
- When fundamentally redesigning a numbering plan, it is reasonable to allow one initial digit for short codes, two for geographic numbering, and three or four digits for mobile and specially tariffed numbering, leaving a small number of initial digits free for long term flexibility.

In order to assess whether a numbering plan is likely to be reaching exhaustion it is necessary to examine the current utilization of each numbering block, the capabilities of the network equipment implementing the plan (both in terms of routing and tariffing capabilities) and to have a knowledge of the forecast growth rates.

¹⁵¹ ETO report on review of national numbering plans on their openness to competition, <http://www.eto.dk>.

7.4 Strategies for expanding capacity

Users do not like major numbering changes. Changes are expensive to implement both for the operator and for the users, and the disruption that they cause is costly. Therefore, best practice dictates that changes should only be made when they are absolutely necessary. Changes made for other reasons, e.g., to “tidy up” the numbering scheme, are to be eschewed.

Nevertheless, in many cases numbering changes become inevitable, either to increase capacity or to add functionality. It is important, however, to minimize the frequency of major changes and to plan for major changes to last 10 or more years.

There are a number of ways of making substantial increases in the capacity of a numbering scheme. However, given that each national numbering plan is unique, it is not possible to identify a single “best practice” approach to expansion of a numbering scheme. But looking across a range of countries, the most common ways of doing this are as follows:

- Adding a new leading digit to the existing numbers (and hence increasing the capacity of the plan tenfold) is the most common strategy. To implement it, a numbering scheme must keep one of the initial digits of the plan free, often referred to as turnaround space, so as to trap misdials. In some cases where major numbering plan changes were required, like in the UK, it has been necessary to implement a two-step change where a limited first step is designed to create the turnaround space for a more substantial second change.
- Inserting a new digit behind the first or second digit of the existing plan. This is appropriate where the initial digits already convey information to the caller. But it can only be implemented satisfactorily if one value of the second or third digit of the current plan is unused or can be cleared with little disruption.
- Lengthening subscriber numbers -- often carried out by adding one or more digits in front of the subscriber number.
- Reducing the number of NDCs -- which can increase the efficiency of the use of each NDC and thus create additional capacity. For example in France, five large geographic areas numbered 1 to 5 were created, and in the Netherlands, 2 and 3 digit area codes replaced many formerly 4-digit codes.

One further alternative option for expanding a numbering scheme is to move from an “open” scheme (one where there is separate local and long distance dialing) to a “closed” scheme (where there is a single dialing procedure with no trunk prefix and typically a single uniform number length). However, note that a closed numbering scheme does not mandate that it also be a fixed length scheme.

Closing a plan can be considered as an extreme form of reducing the number of NDCs. Closure of a plan can offer significant advantages, including:

- a significant expansion of the numbering scheme (by 25% or more depending upon local circumstances) through increased rates of utilization and releasing local dialing codes;
- a single, simpler dialing procedure; and
- uniform number lengths and number formats making numbers easier to remember and dial.

But closure also leads to loss of local dialing and to an increase in the average number of digits dialed, as well as the loss of local dialing information to callers.

Closed schemes are most common in countries with a small geographic land mass like Hong Kong, or with relatively small populations, e.g., Norway and Denmark.

The table below shows the numbering length and whether it was open or closed before and after the most recent major numbering change took place.¹⁵²

Table 8: Numbering length, open/closed dialing in various countries

Country	Numbering length (excluding trunk access code)	Open / closed pre-change	Open / closed post-change
Argentina	10	Open	Open
Australia	9	Open	Open
Bahrain	8	Closed	Closed
Belgium	9	Open	Closed
China	11	Open	Open
Colombia	11	Open	Open
Denmark	8	Open	Closed
France	9	Open	Closed
Germany	11	Open	Open
Hong Kong	8	Closed	Closed
India	10	Open	Open
Italy	10	Open	Closed
Japan	10	Open	Open
Malaysia	10	Open	Open
Netherlands	9	Open	Open
New Zealand	8	Open	Open
Norway	8	Open	Closed
Portugal	9	Open	Closed
Sweden	9	Open	Open
Switzerland	9	Open	Closed
Turkey	10	Open	Open
UK	10	Open	Open

¹⁵² For further information on national numbering plans see the various individual plans at <http://www.itu.int/oth/T0202.aspx?parent=T0202>.

Finally it is worth noting that when planning a major change to the numbering scheme, it is best practice to allow for the possibility that a further major expansion will be required in due course, even if this is in 10 to 20 years. Recognizing this need, it is advisable to reserve one or more leading digits to offer turnaround space and to enable trapping of misdials when further expansion of number length is required.

7.5 Managing the numbering plan

Number management should be aimed at ensuring reciprocity and symmetry between network operators and between service providers. Further, numbering schemes should guarantee the same dialing procedure for all corresponding network operators and service providers. It should also guarantee that the resulting numbering arrangements are transparent, and that the schemes should allow all applicants non-discriminatory access to numbering resources. This requires careful control of the numbering plan.

In a competitive market, best practice requires that the numbering plan be administered by an independent body, in particular one independent of any of the operators.

In virtually all countries the numbering plan administration is undertaken by the national regulatory body, although in a few cases, in particular where numbering administration is particularly complex, such as in the United States, an external organization is contracted to undertake this role. In other cases, for example in Canada, a not-for-profit organization has been specially created for administration of the numbering scheme.

With the transfer of the administration to an independent administrator, the responsibility for the National Numbering Plan must be exercised at a strategic level. Thus the administrator should be responsible for the overall structure and content of the National Numbering Plan, and for the allocation of blocks of numbers from that plan to individual operators. Once the allocations have been made by the administrator, then the operators are themselves free to allocate the numbers from within that range to their own subscribers as required, subject to the requirement that operators continue to meet the rules regarding that particular numbering range.

Best practice requires that the administrator ensure that the National Numbering Plan is managed on behalf of the country as a whole and in response to the requirements for all operators. In general, this means that a high-level allocation of a block of consecutive numbers, for example 10,000 numbers, will be made by the administrator to an operator. Thereafter, the day-to-day operational aspects of that part of the numbering plan will be the responsibility of the individual operator.

In general, the administrator should not be involved in the allocation of individual subscriber numbers from the plan. Instead, it is the responsibility of the individual operator to allocate numbers to individual users from within the blocks under their control.

As an example, suppose a new mobile operator is licensed. This new operator will require numbers for its future subscribers. The new operator would submit an application to the administrator for the allocation of a block of numbers. In accordance with the conditions given in the National Number Plan, the administrator would allocate one or more particular blocks of numbers to the operator. Typically, the size of each allocation made would be planned to last an individual operator a minimum of two-three years.

Once this allocation has been made, it is then the responsibility of the operator to allocate individual numbers from within its allocation to its subscribers. The operator would be required to provide details in an annual report to the administrator on its use of the numbers within that block. This will allow the administrator to oversee the allocation, to ensure that the use of the block is within the conditions specified at the time the allocation was made, and to have an indication of the probable future demand for additional blocks. When the operator can foresee that it will be exhausting its allocation, it can apply to the administrator for further allocations.

Once an allocation has been made, all other operators are required to route calls to and from numbers within that numbering range.

Typically, the functions of the administrator in the National Numbering Plan are as follows:

- to ensure that adequate numbers are available for all telecommunications services throughout the country;
- to be formally responsible for the National Numbering Plan on behalf of the Myanmar Government;
- to ensure that numbers and blocks of numbers are reserved and allocated in an objective, non-discriminatory, proportionate and transparent manner and on the basis of individual applications by the operators;
- to ensure that adequate numbering ranges are available for all publicly available telecommunications services;
- to ensure the availability of number portability and code access where appropriate;
- to allocate codes for use within the dialing plan where necessary;
- to require operators to make changes to the numbering plan where necessary and to oversee changes;
- to ensure that where changes are made to the designated numbering plan, that costs or inconvenience to consumers and operators are objectively justified and are kept to the minimum consistent with meeting demands for numbers and sound management of the National Numbering Plan;
- to consult with the telecommunications industry and users on all major numbering issues to include any review of the National Numbering Plan;
- to ensure that adequate details of the National Numbering Plan are published at a national level;
- to monitor the use of the numbering capacity to ensure that operators comply with the necessary standards and to address issues regarding the National Numbering Plan as and when they arise;
- to undertake an annual audit of the National Numbering Plan; and
- to coordinate the responsibilities of operators and other users of the National Numbering Plan with respect to the international obligations of the country and where necessary and appropriate, to represent the country on numbering matters with the relevant international bodies.

7.6 Numbering management best practice goals

Regulators, acting in the national interest, aim to support users, especially by encouraging competition and lowering costs. Under this approach, best practice for numbering recommends a scheme that enables:

- Effective competition: the numbering plan should be designed and managed neutrally, treating alternative providers and incumbent providers fairly across all numbers and numbering ranges, including in the allocation of golden numbers, for example.
- Effective consumer protection: the numbering plan should ensure that widespread customer expectations about the meanings of numbers – in particular, the tariffs associated with particular codes – are valid. Wrong expectations may need to be corrected by publicity.
- Simple regulation: the numbering plan should be designed and managed in a way that avoids frequent intervention by the regulator. For instance, making long-term changes offering maximum flexibility should eliminate the need for more frequent, smaller changes.

7.7 Numbering for the benefit of users

Users want “user-friendly” numbers. This means that numbers should be short, have uniform structures (ideally with fixed length numbers), and convey the necessary information on the service being called (e.g., fixed, mobile etc.), the tariff and in some cases the geographic location of the caller.

On the other hand many surveys of customers have also indicated that users are very possessive of their own numbers and favor the ability to port their number between operators and services, and even geographically. Clearly this is in direct conflict with the requirements above. It is therefore necessary to adopt a balance between these conflicting requirements.

Users rarely welcome changes to numbers, even when it makes the plan more user-friendly. Thus any changes to the plan should be managed in a way which causes minimum disruption, cost, and inconvenience for customers.

In some cases users are influenced by their cultures to regard numbers as “special.” For instance, in some countries certain sets of digits are seen as lucky or unlucky. Users also have different attitudes about the harmonization of numbers internationally, depending on, for example, how much the user travels. Research indicates that users have differing attitudes regarding open versus closed numbering schemes, i.e., whether to keep local dialing or to only have full national dialing.

Given these conditions, the following best practice aspects of the numbering plan are recommended:

- Geographic NDCs and other significant number ranges should be shared among all competitors;
- To the extent possible, number lengths should be consistent for all operators so as to be non-discriminatory;
- Short access codes with the same meaning should, wherever possible, be harmonized across all operators (e.g., for operator access, directory enquiries, fault reporting, and CLI suppression);¹⁵³
- Number portability should be introduced when and where appropriate (most typically for mobile);

¹⁵³ For some examples see “Towards a European numbering environment” CEC COM(96) 590.

- Numbers should not be owned by customers, but customers should have a reasonable expectation of the right to use their own numbers for a considerable period;
- Number trading between users should be possible, but within defined regulatory or legal guidelines (e.g., to prevent number hoarding or leading to anticompetitive practices); and
- Where required, carrier selection should be carried out by the shortest and most easily memorable codes possible.

7.8 Structure of numbering regulations

The arrangements adopted in most countries where the numbering allocation processes is performed independently of the operators typically have three key elements:¹⁵⁴

- The National Numbering Plan, which contains details of the plan documented in accordance with ITU-T recommendation E.129.¹⁵⁵
- The allocation table (kept by the issuing authority), which contains the status of each individual code (e.g., free, reserved, allocated, quarantined, and unallocatable).
- A set of rules for the allocation of numbers and numbering ranges from the plan, including the necessary procedures for monitoring and reporting on the use of the Plan by each individual operator. This set of rules is known by various terms in different countries, for example as rules or conventions.¹⁵⁶

Typically these rules include:

- the need to ensure that, to the extent possible, there are sufficient numbers available to meet all reasonable demands;
- the need to be compatible with relevant international agreements, standards, and recommendations;
- that the costs and inconvenience to operators and users are objectively justified when changes are made to the Numbering Plan;
- that allocations and reservations of capacity are undertaken in a fair and equitable manner, normally to the first operator that requests the block or code, i.e., on a “first come first served” basis; and
- the arrangements under which allocations can be withdrawn.

¹⁵⁴ For example see “Number assignment practices in CEPT countries” Malta, May 2005 prepared by the Electronic Communications Committee (ECC) within the European Conference of Postal and Telecommunications Administrations (CEPT).

¹⁵⁵ “Presentation of national numbering plans,” ITU-T Recommendation E.129.

¹⁵⁶ For some typical rules see the following examples:

“Harmonised National Numbering conventions” ETO report on behalf of ECTRA for the Commission of the European Union

“National Numbering Conventions” ComReg Ireland

“Numbering and electronic addressing plan” Malaysian Communications and Multimedia Commission (MCMC) January 2006

“Numbering Conventions and the Numbering Code,” Ofcom, UK

“Telecommunications numbering plan and number allocation rules” NAD, New Zealand

“Regulations for allocation and reservation of number capacity,” TRC Jordan

At the same time, operators that have received allocations of numbers or codes must act in accordance with a set of numbering principles including that:

- the use of allocations must be in accordance with the National Numbering Plan;
- numbers must be used efficiently; and
- operators must provide periodic reports to the issuing authority demonstrating their use of the allocated codes and forecasts.

Examples of numbering conventions/rules/guidelines can be found on virtually all numbering administrators' web sites.

7.9 Number Portability

The introduction of number portability, in particular for mobile numbers, can offer a number of significant advantages in a fully competitive market, such as:

- freedom for users to switch from one operator to another without losing their number;
- no need to inform family, friends and customers or to change, for example, business cards or stationery when switching operators; and
- potentially lower prices, better terms, and access to advanced services through increased competition.

For certain countries, number portability may be a mandatory regulatory requirement e.g., from WTO or, as in Europe, from the regulatory authorities.

Currently number portability is operational in over 80 countries worldwide.¹⁵⁷

Nevertheless, experience shows that if mobile number portability is introduced too early in a less mature market, this can lead to a significant risk of causing inappropriate harm to the incumbent. We therefore propose that number portability is only introduced into the Myanmar mobile market after the market has begun to stabilize and when the market trends have become clear.

With regard to fixed number portability, both trend analysis and market experience has shown that this is much less important for users. In particular, average small business users and residential customers assign relatively low costs to number retention, and large business users, who assign much higher costs to number retention, typically are able to keep their existing numbers by taking service from multiple operators including the operator who has their primary number.

It can also be observed that, as result of different legal and contractual arrangements, differences in individual national numbering plans, and differences in the level of competitiveness and market forces in each country, the implementation of number portability is virtually unique for each country. However, a number of common themes can be identified:

- A centralized database, shared across all operators, is likely to lead to a porting process that will offer the smoothest and fastest porting experience for users, as has been adopted in Malaysia, Singapore, Pakistan, and many other countries.

¹⁵⁷ For example wikipedia.org/wiki/Mobile_number_portability and "Implementation of mobile number portability in CEPT countries" prepared by the Electronic Communications Committee (ECC) within the European Conference of Postal and Telecommunications Administrations (CEPT).

- Direct routing of ported calls is the most cost effective solution, other than in cases where porting levels are extremely low. It has been adopted almost exclusively in all countries.
- “One-stop shopping,” where the customer only deals with the importing operator, will lead to the best process from the user’s perspective. This is the approach in virtually all countries where number portability has been adopted in recent years, although some examples remain where, for historical reasons, this is still not the case, like in France and the United Kingdom.
- Offering a very short porting time (e.g., a maximum of one day or overnight porting) is ideal. Examples of locations where porting times are of less than or equal to one day are Malaysia, Singapore, Australia, United States, and Canada.
- “Win-back” processes should be constrained by regulation or voluntary agreements with the operators.
- The same on-net and off-net tariffs are desirable so as to avoid the user needing to identify whether the user they are calling has ported or not.
- Porting should be free of charge, or incur a very low fee. Examples where it is free are Malaysia, Singapore, Australia, United States, and Canada.
- There should be very few reasons that an exporting operator is allowed to use to reject a port.

8 Public Consultation

Public consultations are an essential part of open, transparent, and inclusive decision-making processes, especially regarding the adoption of new or amended regulations. Public consultations serve a variety of purposes, including:

- enhancing industry and public confidence in the regulator through transparent processes that allow for broad stakeholder participation;
- building consensus and support for final regulatory decisions;
- enabling stakeholders to provide input and feedback, thereby affording the regulator a wide range of technical expertise and experiences;
- ensuring that all aspects of an issue have been considered; and
- reinforcing the regulator's autonomy, accountability, capacities, and credibility.

Prior to beginning a public consultation on new proposed regulations, the regulator should prepare the documents to be issued for discussion, including the draft regulations or other proposed rules and a consultation document outlining the process for commenting. In addition, the consultation document should explain the purpose and scope of the consultation; the timeframe for the consultation; and identify the specific issues on which the opinion of various stakeholders is being sought. The consultation document may also include a discussion on international best practices on the subject matter under consultation and invite commenters to provide options not proposed in the proposed rules.

The consultation process typically takes place in three stages: (i) public notice; (ii) consultation period; and (iii) publication of the decision. The public notice involves publishing the consultation document and proposed regulations/rules on the regulator's website and in the gazette, as applicable, and inviting written comments from all stakeholders. The consultation period is the timeframe in which stakeholders must submit their written comments to the regulator, and may range from three-four weeks to two months. Comments are generally published on the regulator's website with the ability for commenters to reasonably request that all or part of their submissions be made confidential.

Once the consultation period is completed, the regulator should consider all inputs and use them to amend or reinforce the proposed regulations/rules if necessary. As a final step, the regulator should post on its website the final regulations, as well as a memorandum explaining the rationale of the decision.