

Establishment of Harmonized Policies for the ICT Market in the ACP Countries

# International Mobile Roaming: Knowledge-based Report

# ICB4PAC

Capacity Building and ICT  
Policy, Regulatory and  
Legislative Frameworks  
for Pacific Island Countries





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## Foreword

Information and communication technologies (ICTs) are serving as the most important driving force behind the Pacific Islands' economic and social integration into the wider global community.

In light of the huge changes that are taking place and mindful of the need to shape them in ways that best reflect the aspirations of the individual islands societies – each with their unique heritage – 15 Pacific countries in the Group of African, Caribbean and Pacific States (ACP) have come together to develop and promote the use of harmonised ICT policies, legislation and regulatory frameworks.

This cooperation has taken the form of a project entitled “Capacity Building and ICT Policy, Regulatory and Legislative Frameworks Support for Pacific Island countries” (ICB4PAC). Executed by the International Telecommunication Union (ITU), the project has been undertaken in close collaboration with the Pacific Islands Forum Secretariat (PIFS), Secretariat of the Pacific Community (SPC), Pacific Islands Telecommunication Authority (PITA), and the Pacific ICT Regional Regulatory Centre (PIRRC), with the support of the University of the South Pacific (USP). A global steering committee composed of the representatives of the ACP Secretariat and the Development and Cooperation – EuropeAid (DEVCO, European Commission) oversees the overall implementation of the project.

This project is taking place within the framework of the ACP Information and Telecommunication Technologies (@CP-ICT) programme and is funded under the 9<sup>th</sup> European Development Fund (EDF), which is the main instrument for providing European aid for development cooperation in the ACP States, and co-financed by the ITU. The @CP-ICT aims to support ACP governments and institutions in the harmonization of their ICT policies in the sector by providing high-quality, globally-benchmarked but locally-relevant policy advice, training and related capacity building.

All projects that bring together multiple stakeholders face the dual challenge of creating a sense of shared ownership and ensuring optimum outcomes for all parties. ICB4PAC has given special consideration to this issue from the very beginning of this project in November 2009. Having agreed upon shared priorities, stakeholders reviewed the methodology and governance for implementing the project. The specific needs of the region were then identified and likewise potentially successful regional practices; these were then benchmarked against practices and standards established elsewhere.

These detailed assessments (knowledge-based reports), which reflect country-specific particularities, served as the basis for the model policies and legislative texts that offer the prospect of a legislative landscape for which the whole region can be proud. The project is certain to become an example for other regions to follow as they too seek to harness the catalytic force of ICTs to accelerate economic integration and social and economic development.

I take this opportunity to thank the European Commission and ACP Secretariat for their financial contribution. I also thank the Pacific Islands Forum Secretariat (PIFS) and the Secretariat of the Pacific Community (SPC) for their contribution to this work. Without political will on the part of beneficiary countries, not much would have been achieved. For that, I express my profound thanks to all the ACP governments for their political will which has made this project a resounding success.



Brahima Sanou  
BDT, Director



## Acknowledgements

This report documents the achievements of the regional activities carried out under the ICB4PAC project “Capacity Building and ICT Policy, Regulatory and Legislative Frameworks Support for Pacific Island Countries”, officially launched in Fiji in November 2009.

In response to both the challenges and the opportunities from information and communication technologies’ (ICTs) contribution to political, social, economic and environmental development, the International Telecommunication Union (ITU) and the European Commission (EC) joined forces and signed an agreement aimed at providing “*Support for the Establishment of Harmonized Policies for the ICT market in the ACP*”, as a component of the programme “ACP-Information and Communication Technologies (@CP-ICT)” within the framework of the 9<sup>th</sup> European Development Fund (EDF), i.e., ITU-EC-ACP project.

This global ITU-EC-ACP project is being implemented by ITU through three separate sub-projects customized to the specific needs of each region: the Pacific island countries (ICB4PAC), the Caribbean (HIPCAR) and sub-Saharan Africa (HIPSSA).

The ICB4PAC focal points and the project coordinator provided guidance and support to the consultant, Mr. Ron Box in collaboration with Mr. Matthew O’Rourke, who conducted the assessment of international mobile roaming in the beneficiary countries. The resulting draft assessment report was then reviewed, discussed and adopted by broad consensus, by participants at the first workshop (New Caledonia, April 2011).

ITU would like to especially thank the workshop delegates from the Pacific Island ICT and telecommunication ministries, regulators, academia, civil society, operators, and regional organizations for their hard work and commitment in producing the contents for this report. These include the Pacific Island Forum Secretariat (PIFS), University of the South Pacific (USP), Secretariat of the Pacific Communities (SPC), Pacific Island Telecommunications Association (PITA) among others. This broad base of public-sector participation representing different sectors allowed the project to benefit from a cross-section of views and interests.

Without the active involvement of all of these stakeholders, it would not have been possible to produce a report such as this, reflecting the overall requirements and conditions of the Pacific Island region while also representing international best practice.

The activities have been implemented by Ms Gisa Fuatai Purcell, responsible for the coordination of the activities in the Pacific (ICB4PAC Project Coordinator), and Mr Sandro Bazzanella, responsible for the management of the whole project covering sub-Saharan Africa, Caribbean and the Pacific (ITU-EC-ACP Project Manager) with the overall support of Ms Reshmi Prasad, ICB4PAC Project Assistant, and of Ms Silvia Villar, ITU-EC-ACP Project Assistant. The work was carried out under the overall direction of Mr Cosmas Zavazava, Chief, Project Support and Knowledge Management (PKM) Department. The document has further benefited from comments of the ITU Telecommunication Development Bureau’s (BDT) ICT Applications and Regulatory Monitoring and Evaluation Division (RME). Support was provided by Mrs Eun-Ju Kim, Regional Director for Asia and the Pacific. The team at ITU’s Publication Composition Service was responsible for its publication.





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## Executive Summary

This report is the first known study of international mobile roaming (IMR) in the Pacific Island countries. While conducting this study, no information could be found on the internet about IMR in the Pacific Island countries. The only information found was studies about IMR in Asia and the Pacific Islands or Asia-Pacific, where the figures are either distorted or do not appear at all because of the small number of IMR users. Therefore, this report provides new knowledge and information on IMR in the region.

This study was conducted through the global ITU-EC-ACP project. It is a new project jointly funded by the European Commission (EC) and the International Telecommunication Union (ITU) for Capacity Building and ICT Policy, Regulatory and Legislative Frameworks for Pacific Island Countries (ICB4PAC).

This report is an assessment and analysis of the present situation of IMR in the 15 ACP countries of the Pacific. It gives a general background on IMR, identifies some of the costs, how IMR agreements were negotiated between parties, whether or not the regulator or other government ministry was involved in these negotiations, looks at regional and international best practices, and reviews IMR trends in other regions.

This report concludes with observations and recommendations, and outlines options that Pacific Island countries could consider.

The key driver for this report, as agreed at the project launch (Fiji, 2009), is to examine why IMR is so costly in the Pacific. Furthermore, consumers are unaware of the costs until they return home.

This assessment of the current situation in the project's beneficiary countries has identified that IMR is available in ten Pacific Island countries, and not in five others. The report examines why it is not available there and found that the main problems include the lack of awareness by consumers and governments; regulatory objectives; the lack of commercial interest by international carriers; lack of capacity by incumbents or regulatory impediments; and a lack of drive for this service from mobile customers.

Where IMR is available, it is consistently at a retail price several multiples in excess of the EC's mandated maximum rates. For voice and SMS services, prices are generally available on providers' websites. For data services, the information is less available and, where available, prices for download limits are invariably more difficult for consumers to understand.

Diseconomies of scale lead to higher costs in Pacific Island countries, but prices at current levels cannot be explained by this alone. The derivation of costs and wholesale rates are commercially confidential so it is not possible to assess the cost basis for retail rates.

In all Pacific Island countries where IMR is available, the regulator does not set prices or intervene in the market. Influence is only indirect: through involvement with interconnection agreements that have some impact on IMR prices. If one holds a view that regulators should intervene in IMR pricing and other arrangements, this study has found there are very limited resources available and that regulators currently have little capacity to do so.

The Pacific Island countries are far from alone in having to deal with problems of high retail costs for IMR. More developed economies, such as Australia and New Zealand, are also having difficulties in resolving this issue. Internationally, only the EC has been able to take action to effectively reduce prices. Action in all other jurisdictions by governments, regulators and international bodies has not been effective to date.

This is partly explained by the lack of an international mandate for national regulators. Suppliers such as Zain, in Africa and the Middle East, have shown that there can be commercial interest in lower prices, but this has been the exception. Primarily due to consumer and administration/regulatory pressure, suppliers have become more transparent by publishing retail rates on websites. There is an economic interest and incentive for Pacific Island countries to provide IMR at reasonable prices. It is a service now expected by tourists and business travellers. Tourism is a very important industry in the region, and conducting international business is increasingly important to travelers in the Pacific Island countries.

The way forward for the Pacific Island countries, just as in other parts of the world other than the European Union (EU), involves a willingness on their part to deal with this issue. With their limited capacity, this will require capacity-building assistance and close cooperation with regional and international organizations such as ITU, Asia Pacific Telecommunity (APT), the Secretariat of the Pacific Communities (SPC), Pacific Island Forum Secretariat (PIFS), and Pacific Island Telecommunication Association (PITA).

This report has a number of recommendations, actions and further work that could be considered by the Pacific Island countries.

### ***Studies***

- Conduct a cost-benefit analysis of the economic benefits of lower roaming charges for tourism and other industries (see section 7.3.4.17).
- Develop cost models using long range incremental costs (LRIC) and take diseconomies of scale into account (see section 7.3.4.12).

### ***Methodologies and toolkits***

- Through ITU, develop an Asia-Pacific framework for an IMR methodology, IMR model and IMR benchmarking practice.
- Develop a Pacific-wide initiative on IMR to develop a toolkit to increase transparency and consumer awareness. This initiative could potentially be funded through the EC or World Bank (see section 7.3.3).

### ***Technical/commercial solutions***

- Consider the utility of IMR substitutes or alternatives (section 7.3.4.4).
- Investigate whether adopting rerouting technologies (section 7.3.4.5) would be viable in the Pacific.
- Investigate whether adopting network solutions (section 7.3.4.7) would be viable in the Pacific.
- Develop alliances or groups (see section 7.3.4.8).

### ***Capacity building***

- Consider ways in which international donors and funding agencies could provide assistance to Pacific Island countries to develop the capacity required to deal with this issue. IMR is a complex issue which, to date, has proven difficult for regulators to deal with worldwide. With limited financial and human resources, this is particularly the case for Pacific Island countries (see section 7.3.4.10).

***International cooperation/negotiation***

- Pacific Island countries' telecommunication regulators should continue to cooperate through PITA, the APT, ITU and other appropriate international and regional organizations (see section 7.3.4.11).
- Pacific Island countries' regulators should liaise with counterparts in nearby economies in Asia, Australia and New Zealand. This could be both independent of and through international organizations such as ITU, PITA and the APT (See section 7.3.4.15).
- Pacific Island countries should seek to have IMR considered as part of the Economic Partnership Agreement (EPA) with the EU, the Pacific Agreement on Closer Economic Relations (PACER) and trade negotiations (see section 7.3.4.16).

***Best practice for regulators***

- Consider the potential IMR best practice for regulators (See section 7.3.4.9).

***Option to benefit tourism and other industries***

- Tourism is a key industry for Pacific Island countries but tourists now expect to be able to use mobile phones for voice and data contact. Lack of availability is highly likely to lead to tourists choosing alternative destinations for their holidays, and business travellers for holding conferences and conducting their business.

While beyond the scope of this current study, Pacific Island countries could conduct a cost-benefit analysis of the economic benefits of lower roaming charges to tourism and other industries.





# 1 Introduction

## 1.1 General

The ICB4PAC project<sup>1</sup> was officially launched in the Pacific by ITU (Fiji, November 2009). The launch was supported by PIFS and other regional organizations, as well as donor and partner organizations. Participants in the official launch included 15 ACP member countries of the Pacific. Civil society, private sector and academia representatives also participated.

Participants were asked what their telecommunication and ICT issues are. A long list was presented and participants agreed on six topics to be addressed by the ICB4PAC project. These are 1) national ICT policy, 2) interconnection and cost modeling, and IMR, 3) licensing, 4) numbering, 5) universal access and services and 6) cyber-security/crime. The methodology was also agreed at this planning meeting, including the need to conduct an assessment of each topic's present situation in each of the 15 recipient countries. This assessment report on IMR is one of these assessments.

## 1.2 Objectives of ICB4PAC

ICB4PAC's objective is to build local capacity and facilitate the establishment of sustainable telecommunication and ICT policies, legislative and regulatory frameworks; accelerate telecommunication and ICT development in and among ACP countries in the Pacific; maximize economic and social benefits; and serve national priorities in line with the Goals of the World Telecommunication Development Conference (WTDC) of the ITU and the World Summit of the Information Society (WSIS)<sup>2</sup> Plan of Action.

The project aims to assist individual beneficiary countries to adopt and implement ICT policies, regulatory and legislation guidelines. It also focuses on building human and institutional capacity in the field of ICT through a range of targeted training and knowledge-sharing measures at regional and national level.

The project uses a demand-driven, bottom-up approach. It pays specific attention to linking the substance of policies and regulations to capacity building, and transposes regional discussions to individual country needs. In this way, a country's needs can be matched to the project's objectives. A component of the project is to transpose the topics to a national level.

## 1.3 Beneficiary countries of ICB4PAC

The beneficiary countries of the ICB4PAC project are the Cook Islands, Fiji, Kiribati, the Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, the Solomon Islands, Timor-Leste, Tonga, Tuvalu and Vanuatu.

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<sup>1</sup> The full title of the ICB4PAC project is: "Capacity Building and ICT Policy, Regulatory and Legislative Frameworks Support for Pacific Island Countries". ICB4PAC is part of a global ITU-EC-ACP project carried out with funding from the EU set at EUR 8 million and a complement of USD 500,000 by ITU. It is implemented by ITU in collaboration with regional organizations and the involvement of other partners in the region (see [www.itu.int/projects/ITU\\_EC\\_ACP/icb4pis/index.html](http://www.itu.int/projects/ITU_EC_ACP/icb4pis/index.html)).

<sup>2</sup> The first summit was held in Geneva in 2003 where the WSIS Declaration was agreed upon by all ITU Member States and the second summit was held in Tunisia in 2005 where the Plan of Action was finalized and agreed to by all ITU Member States.

## 1.4 Project methodology

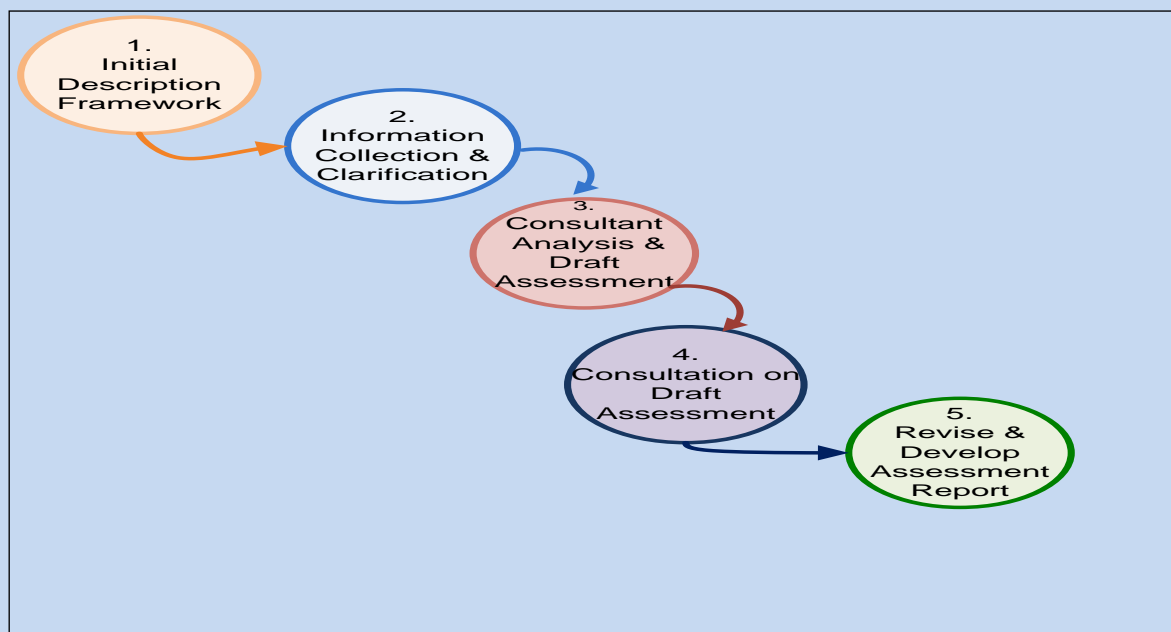
This report assesses the present situation and analyzes IMR in the 15 recipient countries through identifying the cost of IMR, how IMR agreements were negotiated between parties, whether or not the regulator or other government ministry was involved in these negotiations, regional best practices taking into account the specificities of the region, and a review of IMR trends in other regions. A desk study was carried out and data collected from each country to investigate ten specific points.

1. Identify the presence or absence of IMR in each country.
2. Where IMR is present, identify the operators offering this service, the list of overseas operators and the countries where IMR agreements exist; these agreements were then examined to see how they were negotiated, and their IMR costings.
3. Where there is not an operator offering an IMR service, identify and explain the difficulties and main reasons why that country does not have any operators offering IMR.
4. Compare IMR agreements between operators in each country, and identify reasons for success or failure.
5. If possible, identify how roaming costs are calculated.
6. Identify countries where the regulator or other government ministry was involved in negotiations for IMR costing, and if these costs can be regulated or not.
7. Provide a brief overview of recent global trends including a description of:
  - the EU model;
  - the CITEL- Comisión Interamericana de Telecomunicaciones (*Inter-American Telecommunications Commission*) model in Southern America;
  - the initiative for the Gulf States.
8. Identify national and regional best practices and compare the findings with international trends and best practices in order to identify areas for improvement, and suggest ways to fill the identified gaps taking into account the regional specificities.
9. Develop a gap analysis, identifying the most urgent areas for improvement.
10. Identify options and recommendations for improving the present IMR agreements, and also for any country whose operators are currently not offering IMR.

As mentioned above, this assessment was undertaken through desk-based research and analysis, as well as a request proforma sent to the focal points in each recipient country. This approach was considered to be most appropriate for enabling data to be collected, assessed and reported on as well as identify information for further investigation. The proforma is in Annex A.

The stages in the overall process are shown in Figure 1.

Figure 1: Project methodology stages



The project had five stages.

Stage one involved general research and compilation of background information on IMR and related aspects including interconnection, necessary agreements and other requirements for its provision. This information was used to develop a description framework.

Stage two developed an information data-request proforma to gather information in each of the countries. It included, as required, clarification of the information requested from the focal points in each country and, where necessary, any additional information. The responses enabled the current IMR situation in each of the 15 Pacific Island countries to be gathered and described in a manner that aided assessment and analysis.

Stage three:

- identified the presence or absence of IMR, and how agreements were negotiated, including the extent of regulator or government ministry involvement;
- compared IMR agreements, costs and information in each country;
- attempted to identify how roaming costs are currently calculated;
- documented the IMR arrangements applied in each country;
- analyzed global IMR trends including the EU and CITES models and the Gulf States initiative.
- established if there were national or regional best practice models and if a best practice IMR framework existed that could be applied in the Pacific region;
- identified any gaps or areas that could be improved, and suggested solutions that could be adopted.

Stage four used the conclusions reached in stage three to develop a draft assessment report that was reviewed by the Pacific Island countries. They were asked to:

- (a) confirm the report's accuracy or correct any factual errors;
- (b) comment on and confirm their country's arrangements and the report's assessment;
- (c) comment on any aspect including the observations made, proposals and considerations.

Stage five revised the report based on the comments received from each country. The report was then discussed and agreed by consensus at a regional workshop (New Caledonia, April 2011). The list of participants is in Annex B.

## 1.5 Report structure

The report is structured as follows:

- *Chapter 2* is a general background on IMR and pertinent issues. It describes IMR and related aspects including interconnection, the necessary agreements and other requirements for its provision.
- *Chapter 3* provides information and gives market background on each Pacific Island country. It also outlines the legislative and regulatory frameworks in which IMR operates for each country.
- *Chapter 4* discusses the availability of IMR in the Pacific region.
- *Chapter 5* reviews global IMR trends and current developments.
- *Chapter 6* provides an initial country and regional assessment of IMR in the Pacific.
- *Chapter 7* provides observations and options that individual Pacific Island countries could consider, and recommendations.

## 2 IMR: background information

### 2.1 What is IMR?

**In the 1980s** IMR evolved differently in various parts of the world. It enables a customer of a home mobile network to make and receive calls on another mobile operator's network whilst travelling overseas. It also includes originating and terminating text (SMS) messages, data, surfing the Internet and mobile broadband services.

The term 'roaming' is used to describe a customer's ability to use their mobile phone for these services on another mobile operator's network when traveling abroad, while still being billed by their existing mobile operator in their home country. The customer's mobile phone number remains the same while roaming. When customers roam on to another mobile operator's network, that 'temporary mobile phone operator' bills their home mobile phone operator for services made and received while roaming on the overseas network. Roaming was a natural outcome of mobility and was initially used by professionals and others who travelled for business. It was introduced as a premium service that came with a premium price. It became more 'mass market' with interoperability.

IMR was originally developed for first-generation mobile technology in Scandinavia and taken up in the second-generation standards for GSM.<sup>3</sup> It was included in 3G platforms, in particular **universal mobile telecommunication system** (UMTS), with the additional possibility of national roaming and IMR on GSM networks, while 3G networks were in development. IMR is also integrated in long term evolution (LTE) mobile technology, sometimes known as 4G.<sup>4</sup>

The success of IMR in attracting new operators and new customers for GSM services pushed other technology platforms to adopt their own versions of IMR; notably **code division multiple access** (CDMA), the principal rival cellular wireless technology. The absence of IMR is a problem for operators using time division (TD) SCDMA. TD is a form of 3G still found only in China, resolved by handsets that can roam on GSM networks. IMR was also taken up by Wi-Fi and WiMAX<sup>5</sup> groupings, to attract additional operators and to respond to consumer expectations of an international service SCDMA.<sup>6</sup>

IMR is arranged for customers through shared and commercial agreements between home and overseas mobile operators. IMR is enabled by complex commercial agreements, technical connectivity and billing procedures.

The complexity of the necessary arrangements has led, to some degree, to increased costs for mobile operators, which then results in higher prices for consumers of IMR services. This complexity has also led to a lack of transparency and, in some cases, unexpectedly high charges for customers. This is often referred to as 'bill shock'. For further information on this issue see section 2.5.3.

#### 2.1.1 Importance of IMR<sup>7</sup>

The rapid growth in the number of mobile subscribers across the world over the past decade – now in excess of 50 per cent of the world population – has dramatically changed the telecommunication landscape. Mobile telephony has become the dominant form of telecommunications in both developed and developing countries; with the number of mobile phones overtaking fixed lines in the majority of countries across the globe. Mobile telephony now offers huge advantages for individuals, businesses and economies. Nevertheless, the rise of mobile communications has raised a major and troubling issue: IMR rates.

<sup>3</sup> Haug (2002).

<sup>4</sup> GSMA (2010).

<sup>5</sup> See section 7.3.4.6 for a definition of WiMAX.

<sup>6</sup> Sutherland (2010a).

<sup>7</sup> Lazauskaite (2008).

## Section II

IMR has become a highly advanced technological, commercial, and financially attractive proposition for network operators around the world. This issue has been widely discussed among regulators, operators and end-user associations for some time, and continues to be a hot issue.

As ownership of mobile phones has become more widespread around the world there has been an increasing demand for roaming services. Business travellers see it as a critical way of conducting and maintaining their business objectives, and building relationships. Data downloads, Internet surfing and email access through a mobile is an increasing necessity and important business tool for business travellers. Tourists want (and expect) to be able to roam and ‘keep in touch’ with family and friends.

All this comes at a price. However, there is increasing concern that the prices charged are excessive and, equally as important, pricing transparency and consumer awareness of the prices – both from home and abroad – is very low.

Telecommunication analysts estimate that IMR rates generate 5-10 per cent of operators' revenues globally (sometimes up to 15 per cent), and constitute an even bigger slice of their profits, given it constitutes just over one per cent of traffic. However, for convenience, and often a lack of any viable alternative to IMR services, consumers (especially business users that need to make mobile international calls, download data, and send emails and SMS messages) continue to use IMR even in the face of high tariffs.

It is no surprise then that the subject of high IMR charges is now of great concern and interest to many governments and regulators, including those in the Pacific region. This is a major factor behind this study. The view that IMR charges are disproportionately high relative to cost has been expressed in a number of other studies and surveys as well as in regulatory debates.

A study on IMR charges in the Arab States conducted by the Arab Regulators' Network (AREGNET) in 2006,<sup>8</sup> found that prices charged for IMR are considered by consumers to be unsatisfactory. Specifically, the study highlights that:

- IMR charges in the region are not transparent;
- the details of charges are not widely known, and are difficult for users to find;
- IMR charges change frequently, and this makes it even more difficult for subscribers to know what they can expect to pay for a roamed call;
- there are large differences in IMR charges between different networks;
- In many countries with more than one mobile operator, IMR customers are charged differently depending on the network they are using.

Results of another study conducted on regional roaming charges in the Caribbean region, commissioned by the Organization of Caribbean Utility Regulators, showed that IMR customers paid substantially higher charges for making international calls than non-roaming customers; at times up to 400 per cent more. That study also found that roaming charges were usually higher where a home mobile operator had no network presence in the foreign country. In some cases, comparison of IMR charges was made more complex because of the different taxation systems in place.

Competition has driven down prices for mobile services, such as monthly subscriptions, per-minute and per-SMS charges, with noticeable reductions in the per-unit revenues earned by the operators. By comparison, IMR has been relatively resistant to this downward pressure; given high IMR prices help to generate revenues to offset other downward pressures on average revenue per user.

<sup>8</sup> NTRA (2006).

Even though roaming utilizes excess capacity, there are roaming-specific incremental costs incurred:

- interconnection costs (for roaming) – call delivery;
- signalling costs – authentication, location updates and SMS delivery;
- backhaul – carries (voice and data) traffic to/from cell sites;
- administrative costs;
- contracts – roaming agreement/roaming partner;
- SIM card management;
- testing, billing, revenue assurance, settlement, etc.;
- financial and IT costs;
- roaming record processing, rating and TAP processing;
- IP backbone, APNs and Internet portals as well as the labour costs to manage or perform these tasks.

## 2.2 Interconnection and access

Interconnection and access play key roles in the termination of calls, SMSs, data or mobile broadband services to a mobile; or when making a call, sending an SMS or surfing the Internet from a mobile.

When there is any element of IMR in play, the ‘normal’ interconnect and access arrangements and costs play a greater role. It makes the establishment of IMR arrangements more complex and heavily influences the costs, to both consumers and the relevant terminating access operator or originating access operator, and the associated charges between operators. It is quite clear that high interconnection and access costs contribute to high(er) IMR costs.

A more detailed description of interconnection and access can be found in a separate ITU report developed under the ICB4PAC Project.<sup>9</sup> It includes:

- definitions;
- illustrations of terminating and call origination services;
- fundamental issues associated with interconnection;
- associated cost modelling in the Pacific.

## 2.3 IMR agreements and requirements: general

Given that IMR services go beyond the boundaries of a single country (the customer’s ‘home country’), the availability of IMR depends and relies on contracts, agreements and operational requirements signed between the customer’s home country and the foreign operators of the countries the customer roams to, while the prices charged to the customer relate to the pricing principles and rates of both the home and visited operators; sometimes with the involvement of a third operator.

As such, IMR provision depends on cooperation and coordination between mobile operators, and necessary market intervention where regulators request IMR provision.

In addition, the technology used by the customer’s ‘home country’ (for example, GSM or CDMA) must be supported in the destination country and there must be an agreement in place between the home mobile operator and the mobile operator in the destination country.

<sup>9</sup> Holmes (2010).

## Section II

The legal roaming business conditions negotiated between the roaming partners are usually stipulated in these agreements. The GSM Association (GSMA) and the CDMA Development Group broadly outline the content of such roaming agreements in standardized form for their members. Without such agreements, mobile operators are not able to provide these services.

As an example, on its website, the Australian Communications and Media Authority (ACMA) indicates that there are currently no agreements in place between Australian mobile operators providing CDMA services and overseas CDMA networks. Consequently, an Australian CDMA mobile subscriber cannot use an Australian CDMA phone overseas. Likewise, there can be difficulties with some GSM phones as well, even if most of the world's mobile operators use the GSM standard. Countries have allocated different frequency bands for GSM communications, with some countries using the 900/1800 MHz bands and others having allocated the 850/1900 MHz bands. These devices can only work in a country with a different frequency allocation if they can support one or both of that country's frequencies (that is dual and triple band handsets).

## 2.4 How IMR works<sup>10</sup>

### 2.4.1 General

IMR differs technically with the different types of mobile networks but there are general points that can be made.

- A visited network attempts to identify the subscriber's home network. If there is no roaming agreement between the two network operators, IMR is not possible. The subscriber will not be able to make and receive voice calls, send and receive data, or access other mobile services.
- If an agreement exists and IMR arrangements are in place, the visited network contacts the subscriber's home network and requests service information about the roaming customer and whether or not the device should be allowed to roam.
- If the correct information is successfully received, the visited network creates a temporary subscriber record for the device. The home network updates its information to indicate that its customer is using a host network to ensure that any information sent to that device will be correctly routed.
- Calls are then routed by the visited and host networks and, in some cases, by a transit network, by international transit and/or any fixed or mobile network, and/or the relevant home network(s), depending on the type of call.
- The visited network captures the details of all calls, which are used to calculate wholesale international mobile roaming charges.
- The home operator pays wholesale charges to the visited operator. The subscriber pays retail charges for international roaming services to its home operator.

<sup>10</sup> Lazauskaite (2008). See also, the Technical Description of IMR, May 2010, a paper to be read in conjunction with the Australia/New Zealand Discussion Paper: Trans-Tasman Mobile Roaming, released in May 2010 and referred to in section 5.13 of this report, for another description of how IMR works.

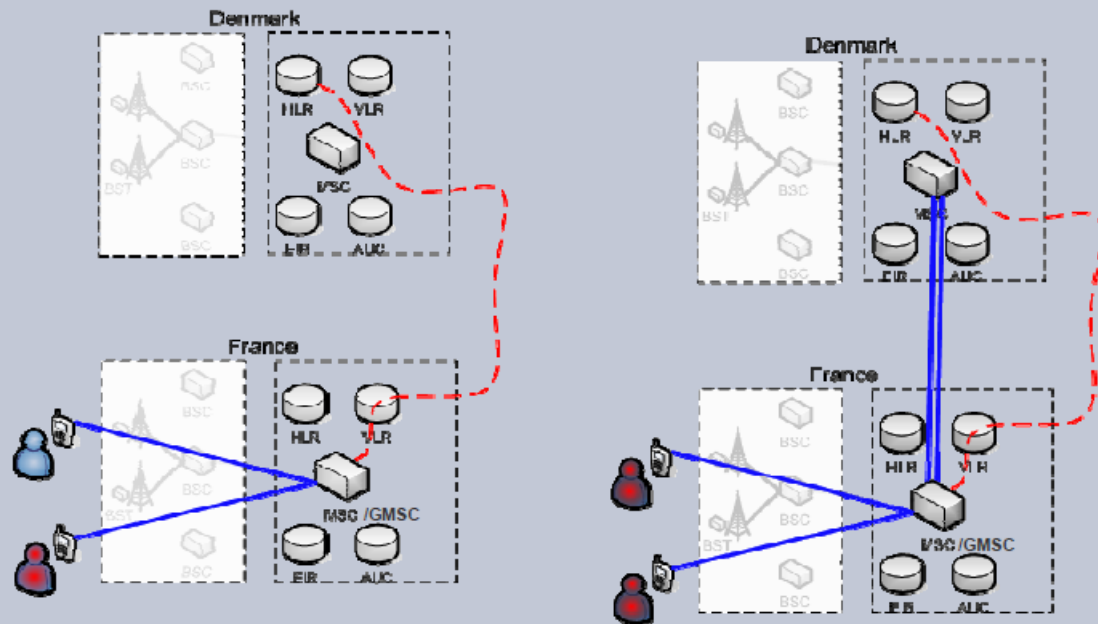


These stages are illustrated in Box 1.

**Box 1: Technical explanation of international mobile roaming between two GSM networks**

In a GSM network, a call originated at a mobile device through the Base Station Subsystem (BSC) goes on to a Mobile Switching Center (MSC). The MSC contacts the Visiting Location Register (VLR). The precondition for registration by the VLR is that there is a roaming agreement between the visiting network and the user's home network. The VLR sends the location information of the mobile station to the subscriber's Home Location Register (HLR). In this way the HLR is always updated with regard to location information of subscribers registered in the network. The information sent to the HLR on GSM networks is normally the Signalling System 7 (SS7) address of the new VLR, although it may be a routing number. The MSC routes the call to a Gateway Mobile Switching Center (GMSC). The GMSC interrogates the called subscriber's Home Location Register (HLR) for a Mobile Station Roaming Number (MSRN), then uses the obtained MSRN to route the call to the correct MSC in which the called subscriber is present. The call then goes through the BSC to reach the destination device.

There are always signaling communications between the visited and home operator when roaming, even when the call is routed inside a visited country. Two examples are illustrated below. The diagram on the left shows a subscriber of a Danish operator traveling to France and calling a French operator's subscriber. The diagram on the right shows a subscriber of a Danish operator traveling to France and calling another subscriber of the same Danish operator, who is also currently visiting France. The dashed red lines indicate signaling channels, and blue lines indicate voice channels.



Note: EIR – Equipment Identity Register is a database that contains a list of all valid mobile stations within a network.

AUC – Authentication Centre is in charge of subscriber's authentication.

Source: Falch, M., Henten, A., Tadayoni, R. (2007), Regulation of international roaming charges the way to cost based prices?; Subramanya, S.R., Byung K. Yi. (2005) Mobile communications – an overview. At <http://ieeexplore.ieee.org/iel5/45/33556/01594007.pdf?amumber=1594007>

### 2.4.2 Cost elements of IMR<sup>11</sup>

Among other technical specifications, international mobile roaming agreements set inter-operator tariffs (IOT), which are agreed bilaterally between the home and visited network operators. Discounts related to the volume of traffic passed between operators may be negotiated. IOTs (effectively wholesale international mobile roaming charges) involve the following elements:

- mobile origination;
- mobile/fixed termination;
- international transit;
- roaming specific costs – incurred by operators for roaming-specific services such as contracting, billing other operators, testing and specific signalling.

Retail IMR includes additional specific retail costs (for example, billing and marketing) depending on the type of services supplied.

There are four general types of IMR services:

- calls/SMS/other services inside a visited country: when a traveller from country A visits country B and makes a phone call/SMS inside the visited country using a mobile network in country B;
- calls/SMS/other services from a visited country to the home country: when a traveller from country A goes to country B and makes a call home;
- calls/SMS/other services from a visited country to a third country: when a traveller from country A goes to country B and makes a call to country C;
- receiving calls/SMS/other services in a visited country: when a traveller from country A goes to country B and receives a call from subscribers of either of the countries; or even another country.

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<sup>11</sup> Lazauskaite (2008).

A diagrammatic illustration of the main IMR services and their cost structures is shown in Figure 2.

Figure 2: Cost structure of international mobile roaming services

Call type	Cost elements	Illustration
<p><b>Call inside a visited country</b> A traveler from country A goes to country B and makes a call to a subscriber of country B.</p>	<p>Mobile origination in country B + [National transit in country B] + Mobile termination in country B + Roaming-specific costs + Retail-specific costs</p>	
<p><b>Call from a visited country to the home country</b> A traveler from country A goes to country B and makes a call back home to a subscriber in country B.</p>	<p>Mobile origination in country B + International transit + Mobile or fixed termination in country A + Roaming-specific costs + Retail-specific costs</p>	
<p><b>Calls from a visited country to a third country</b> A traveler from country A goes to country B and makes a call to a subscriber in country C.  Note that country C may or may not be in a region where international roaming prices are regulated.</p>	<p>Mobile origination in country B + International transit + Mobile or fixed termination in country A + Roaming-specific costs + Retail-specific costs</p>	
<p><b>Receiving a call in a visited country</b> A traveler from country A goes to country B and receives a call from either of the countries.</p>	<p>Mobile termination in country B + International transit + Roaming specific costs + Retail specific costs</p>	

Note: In some cases, international transit services might be used several times. For example, if a subscriber of country A goes to country B and makes a call to a subscriber of country C, which is visiting country A at the moment of the call. This would lead to 1 mobile origination, 2 international transits (country A – country C, country C – country B), 1 mobile or fixed termination plus roaming-specific and retail-specific costs. For a detailed explanation please refer to Falch, M., Henten, A., Tadayoni, R. (2007), Regulation of international roaming charges: the way to cost based prices?

## 2.5 IMR problems

### 2.5.1 General

International mobile roaming has been subject to market interventions since the 1990s, through pressure to require operators to provide customers with roaming, then trying to limit the increasing prices, that were seemingly immune to the effects of competition.<sup>12</sup>

Competition has driven down prices for mobile services, such as monthly subscriptions, per-minute and per-SMS charges, with noticeable reductions in the per-unit revenues earned by the operators. By comparison, IMR has been relatively resistant to this downward pressure. In part, this is because some consumers simply ‘use the service’, valuing its convenience over the costs (which they may not pay themselves), and partly because it is not properly evaluated at the time of entering into contracts.

The primary problem associated with IMR,<sup>13</sup> which remains today, has been the persistence of high IMR prices, despite the presence of competition on other mobile markets.

Secondary problems include:

- ‘bill shock’ (discussed in section 2.5.3) of extreme charges for a small number of users returning from foreign travel;
- identification of means to intervene effectively on the retail and wholesale markets;
- development of a sufficient understanding of the economics of those markets to formulate the impact assessments necessary to evaluate possible interventions;
- the need for an appropriate legal basis for transnational interventions.

### 2.5.2 The Asia-Pacific region

In the Asia-Pacific region, there have been sporadic calls for action by consumers and business-user groups, notably from Australia and New Zealand.

Regulators have considered the issue but have been constrained from acting by their mandate. For all services except IMR, regulators have the power to act and have been able to intervene where there are problems with pricing. Typically, a regulator’s mandate is to act in a domestic market in the interests of consumers who are resident in that domestic market.

When mobile roaming customers of country A roam in country B, and customers of country B roam in country A, the regulator in country A has a mandate to protect the interests of residents of country A but does not have the authority to intervene on behalf of a country A customer who is roaming in country B. The regulator in country A has the power but not the mandate to regulate on behalf of a customer of country B who is roaming in country A. The only jurisdiction where this is not the case is the EC due to its economic integration. In all other jurisdictions, action would have to first come from agreements between governments to cooperate and possibly extend the role of regulators.

Related to regulators’ lack of a mandate, to date, there have been neither economic analyzes nor impact assessments of the various options (for example, improved price transparency, market opening and price controls) nor publication of the data necessary for such analyzes.

<sup>12</sup> Sutherland (2010a).

<sup>13</sup> Sutherland (2010b).

There have been no analyzes of the areas in which unilateral action can be effective and, beyond that, whether it is more effective to engage in bilateral or collective action through the regional economic groupings. Discussion of price cuts raises concerns over the seemingly vague purpose of such interventions and consequently over the uncertain scale, scope and the effects of any reductions.

This report is an attempt to redress the situation, and find ways to improve the present IMR arrangements and costs for Pacific Island countries. These are significant issues given that the Asia-Pacific region is the second largest regional market for outbound roaming (that is retail IMR revenues); showing strong growth; and the vast majority of the revenues generated from voice telephony (with only modest growth forecast from SMS and mobile data).<sup>14</sup>

### 2.5.3 Bill shock and transparency of roaming charges

Bill shock is a major cause for concern for both residents travelling overseas and visitors to another country due to unexpectedly high charges for customers. This has accentuated demands for the regulation of roaming charges.

In a recent article in an Australian newspaper,<sup>15</sup> the author opined: ‘International roaming, whether it be calling home, sending and receiving SMS messages, or just surfing the Internet, is by far the most expensive activity you can undertake on your mobile, and there’s no regulation to curb it.’

The author described the situation facing an Australian business traveller who, following an assignment in the Netherlands late last year, had returned to find a bill of AUS\$6,125. The traveller indicated that he had used his Australian operator SIM card in his laptop during the period to check emails and surf the Internet for no more than 20 minutes a day.

In Australia, his plan price usage was nine cents per megabyte, yet overseas it was AUS\$15 per megabyte. That’s 150 times more expensive away from home. His normal monthly bill was in the order of AUS\$195.

Gary Schwartz, an IT expert,<sup>16</sup> provides some clarity to the problem. He says a single megabyte is approximately 100 emails sent and received without attachments. He goes on to explain: ‘However, three emails with attachments usually take about one megabyte and an email with a photo is about the same as that.’ He suggests: ‘Maps that are commonplace on many phones can use three megabytes and I think that is where a lot of people get caught out.’

Schwartz says applications such as Facebook, Twitter and instant messaging also add up: ‘One hour of web browsing can use, roughly, between 1.5 megabytes and 25 megabytes [...]. Use You Tube and other video and media-rich content and it can use a lot more.’

These examples offer some cautionary advice and useful information on the added complexity facing overseas travellers with IMR. It also adds weight to the argument that it is critical that information on expected costs for a range of roaming services should be transparent and provided urgently.

Although there are high costs for using voice services when roaming, it is clear that the growing use of mobile broadband, rather than voice roaming, is contributing greatly to bill shock. While customers have been encouraged to use this service, and may be on local plans to do so, in their home country as if it were unlimited, ‘the message that it should be used exceedingly sparingly when abroad has not been given the same attention’ (Sutherland, 2010, p.9).<sup>17</sup>

<sup>14</sup> Sutherland (2010b).

<sup>15</sup> Courtenay (2010).

<sup>16</sup> Working for jargonfreehelp.com

<sup>17</sup> Sutherland (2010b).

## Section II

An argument could be put that it may be smarter to simply turn off a smart phone while overseas to overcome the problem of prohibitive IMR data downloads, but Elissa Freeman, Director of Policy at the Australian Communications Consumer Action Network (ACCAN),<sup>18</sup> is of the view that this does not address the issue of fair pricing for IMR use.

Rosemary Sinclair, Managing Director of the Australian Telecommunications User Group, believes that excessive charging cannot be laid solely at the feet of local operators because they have to negotiate a deal with other countries' networks; meaning that it comes down to what the 'distant' foreign carrier charges the home country operator for 'hosting' home country mobiles overseas. Importantly, she believes that there is no commercial incentive to drive costs down, saying: 'Everyone's ripping each other off – and that's why unhappily we're at the point where regulators and governments now have to take direct action.'

Operators do not have an incentive to be transparent because the information regarding the distribution of income from IMR is confidential, as are the cost models used. This makes it impossible to determine exactly how much it costs to provide services, who is paying whom and how much.

It is fairly clear that the problem for the Australian business traveller during his assignment in the Netherlands stemmed not just from excessive charging but also from a lack of communication and transparency. In this situation in Australia, there was no proactive advice to inform the customer when he had reached a certain limit; with the expectation that a check on data usage can be made online. However, there are no concerted efforts on the part of the mobile operators to advise the customers that they can check their data usage online.

As Ewan Sutherland explains, this has been addressed in the EU:

*'The remedy for bill shock imposed by the European Union has been to alert customers at 80 per cent of a spending limit – by default this is €50 – then stopping the use of the roaming service at the limit. The Regulation separately requires that calls to the customer service of the home operator are free of charge, so that customers can call to enquire and can confirm that they are willing to continue to pay the charges and have the service restarted. These provisions apply only within Europe and not to Europeans travelling to Asia and the Pacific, though there is some pressure for an extension beyond the EU.'*<sup>19</sup>

<sup>18</sup> ACCAN is the influential body in Australia for consumers and organizations on issues including telecommunications and the Internet.

<sup>19</sup> Sutherland (2010b).

## 3 Legislative and regulatory framework for Pacific Island countries<sup>20</sup>

### 3.1 General

This section provides information on and outlines the:

- market background for each Pacific Island country;
- legislative and regulatory framework in which IMR operates for each Pacific Island country;
- interconnection and cost modelling arrangements for each Pacific Island country;
- IMR resources and experience of the regulatory authority, or part of the ministry or department with IMR authority.

This chapter draws from data relating to questions 3-11, 19 and 20 in the data request form; see Annex A.

### 3.2 Pacific Island country information

The arrangements and information outlined in Chapter 3, are discussed in detail for each Pacific Island country.

#### 3.2.1 Cook Islands

##### 3.2.1.1 Country and market background

The Cook Islands comprise 15 islands with a total land area of 240 square kilometers, within an exclusive economic zone covering 1.8 million square kilometers of ocean. The total population at the 2006 census was 19,569, of whom 14,153 lived on the island of Rarotonga; with present estimates of a population of around 24,000.

For telecommunication purposes, it is important to note that there is a much larger population of Cook Islanders in New Zealand. In the 2006 census, 58,008 self-identified as being of ethnic Cook Island Maori descent. Tourism is a major and growing industry and this drives the need for telecommunication services that meet tourist expectations and needs.

Telecom Cook Islands (TCI) Limited is 40 per cent government-owned and 60 per cent owned by Telecom New Zealand. It is the only service provider in the country. TCI provides fixed, mobile, Internet and international gateway services.

##### 3.2.1.2 Legislative framework

The provision of telecommunication services is governed by the Telecommunications Act 1989, which is administered by TCI. The legislation does not support competition and creates rights and obligations for the service provider and establishes the power of the minister.

The government has determined to introduce competition and terminate the telecommunication monopoly. The existing act has been reviewed and new legislation prepared in the form of the *Telecommunications Bill 2009*. This bill may be deferred or delayed and may, in the course of parliamentary debate, be amended. Therefore, the assessment in this report will be based on current practices but will note and make observations on the policy intentions.

<sup>20</sup> Holmes (2010).

The bill provides for the creation of the Telecommunications Commissioner as an independent regulatory authority, with a duty to support and promote sustainable and efficient competition in the market for the benefit of end-users. In Part 7 of the bill, explicit provision is made for interconnection.

- The Telecommunications Commissioner will be required to ‘promote adequate, efficient and cost-oriented interconnection of telecommunication networks and access by service providers to telecommunication facilities of other service providers’.
- The commissioner has the task of promoting interconnection agreements and resolving disputes in the course of negotiations through arbitration.
- The bill sets out the process that will be followed if a request for interconnection is made by one licensed operator to another:

‘Interconnection charges of dominant service providers or network providers ... shall be cost-based, or if this is not possible, use benchmarking techniques. The Commissioner may approve a plan to phase in this requirement over time, taking into account the financial impact on the affected dominant services providers.’

The bill does not explicitly confer a clear and absolute obligation to interconnect or a clear and infeasible right to interconnect on network operators. The rights and obligations are hedged around with other considerations, such as the right not to enter into an agreement that might result in physical harm to a network. Sub-clause 36(4) empowers the commissioner to clarify interconnection rights and obligations at the request of any service provider or other interested party. This is clearly a useful provision, but might be better if made complementary to a clearer statutory statement.

### 3.2.1.3 Regulatory framework and arrangements

There is no separate regulatory agency, and no need for a competition regulator because there is only one telecommunication supplier, TCI. The Prime Minister’s Department has ministerial oversight of TCI.

### 3.2.1.4 Interconnection and access

There is no interconnection and access requirement at this stage of the development of telecommunication in the Cook Islands. However, the government will need to give consideration to the substantive arrangements and the development of relevant regulatory capacity and structures if the proposed opening of network services markets to competition is to be successful.

### 3.2.1.5 Cost modelling capability

TCI has developed, with assistance from Telecom New Zealand, a fully distributed cost (FDC) model which has been used as an input into the setting of subscriber line rental charges. There is, therefore, some capability to examine other costs, including for call services and call termination, in the future.

It draws on GSMA standards for mobile roaming.

### 3.2.1.6 IMR framework, legislation and arrangements

In the Cook Islands no regulatory frameworks or IMR arrangements are in place. And IMR guidelines have not been established.

There are also no orders or decisions from the ministerial office or the regulatory authority currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place.

For further information, see Chapter 6.



**3.2.1.7 Resources and experience dedicated to IMR**

The Cook Islands has advised that it has not allocated any staff to considering this issue. There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

**3.2.2 Fiji****3.2.2.1 Country and market background**

Fiji comprises an archipelago of about 322 islands, of which 106 are permanently inhabited, and 522 islets. The two major islands, Viti Levu and Vanua Levu, account for 87 per cent of the population of 849,000.

The telecommunication sector has been opened to controlled competition for some time, and has been opened further in the past years with the licensing of Digicel to provide mobile services.

Licensing is undergoing significant change and the new arrangements are still in draft form. As a consequence, licences date from different periods in the sector's liberalization. There has been industry agreement, however, that licences should be open, entitling the licensee to participate and provide services in any telecommunication market. Notwithstanding that, in practice, licensees have tended so far to remain in the service markets that represent their strengths, as shown in Table 1.

**Table 1: Licensed service providers and their markets**

Service market	Licensed service providers
Fixed	Telecom Fiji Limited
Mobile	Vodafone, Digicel, INKK (an MVNO associated with Vodafone)
Internet	Many licensed ISPs including those associated with carriers, such as Connect (associated with TFL). Includes FINTEL (Kidonet Ltd), TFL (Connect Fiji Ltd), Unwired Fiji Ltd, Ring of Fire Ltd and Vodafone Fiji Ltd.
International services	FINTEL (Fiji International Telecommunications Limited, which controls the only landing station in operation so far, connected to Southern Cross Cable)

**3.2.2.2 Legislative framework**

The Commerce Act 1998 established the Fiji Commerce Commission as a multi-sector regulatory agency for the regulation of any industry designated by a minister.

In particular, the commission has the powers in relation to regulated industries of:

- (b) the maintenance of a register of access agreements;
- (c) the facilitation of negotiations about access to infrastructure facilities or services under access regimes;
- (d) the arbitration of disputes about access to infrastructure facilities or services under access regimes<sup>21</sup>

The act establishes the commission as an independent agency, independent of both the government's policy-making arms (ministries) and the participants in the telecommunication market.

<sup>21</sup> Section 10(1), Commerce Act 1998.

The Fijian telecommunication and ICT market was fully liberalized in July 2009. The Telecommunications Authority of Fiji (TAF) was mandated to provide a range of functions under the provisions of the Telecommunications Promulgation 2008.

Under this arrangement, the Fiji Commerce Commission and the TAF shared the regulation of the telecommunication sector .

### 3.2.2.3 Regulatory framework and arrangements

Under the *Commerce Act 1998*, the telecommunication industry that has been designated for regulation by the Fiji Commerce Commission. The act requires ‘person proposing to enter into an access agreement for facilities or services’ to advise the commission at least 30 days beforehand.<sup>22</sup> This enables the commission to give advice on the proposed agreement to the person involved and the minister.<sup>23</sup> The commission does not have a remit to prevent the agreement from being signed or implemented. In addition, anyone entering into such an agreement must notify the commission and provide a copy so that it can be registered. There is no provision for the commission to intervene and require changes to the agreement if it is considered not to be in the public interest.

The commission may act as an arbitrator if one or both parties to a dispute over access refer the matter for arbitration. The act sets out the issues that must be considered in the course of resolving the matter:

- ‘(a) the access provider's legitimate business interests and investment in the infrastructure facilities or services;
- (b) the costs to the access provider of providing access, including any costs of extending the facilities but not costs associated with losses arising from increased competition in upstream or downstream markets;
- (c) the terms of access for the third party;
- (d) the economic value to the access provider of any additional investment that the third party or the access provider has agreed to undertake;
- (e) the interests of all persons holding contracts for use of the facilities;
- (f) firm and binding contractual obligations of the access provider and other persons already using the facilities or services;
- (g) the operational and technical requirements necessary for the safe and reliable operation of the facilities or services;
- (h) the economically efficient operation of the facilities or services;
- (i) the benefit to the public from having competitive markets;
- (j) whether, if the access provider were required or permitted to extend the infrastructure facilities, the extension should be technically and economically feasible and consistent with the safe and reliable operation of the facilities;
- (k) the compensation (if any) which should be paid to the access provider;
- (l) applies any subsections submissions made concerning the dispute by the public;
- (m) any other matters that the arbitrator considers relevant.’<sup>24</sup>

This is a comprehensive list of considerations, which includes the issues that one would want the regulator to consider in determining interconnection rates.

<sup>22</sup> Section 19.

<sup>23</sup> Part 3 of the Act.

<sup>24</sup> Sub-section 26(4).

Determinations resulting from arbitration are binding on the parties to the dispute.<sup>25</sup>

In 2008, a new Part 5A was added to the act to deal explicitly with telecommunication services, and interconnection specifically.

### 3.2.2.4 Interconnection and access

#### 3.2.2.4.1 Interconnection

Section 36(E) of the Commerce Act 1998, gives the commission power to examine telecommunication markets to determine if there is ‘significant market power’, and to impose regulatory obligations to reduce the risk of harm that might result from such power. Amendments to the act make it clear that licensed operators are obliged to provide interconnection and the right to seek it with other licensed operators.

The amendments also define the factors that licensed service providers may take into account when determining charges for interconnection services:

- (a) the direct costs incurred in providing the interconnection service;
- (b) a reasonable contribution to fixed and common costs;
- (c) a reasonable return on the capital employed in providing the service.<sup>26</sup>

This amendment equates to the best practice already outlined in this report, and adds to the principles that the commission may consider when arbitrating these matters.

The act now gives the commission power to require the preparation of reference interconnection offers.<sup>27</sup>

#### 3.2.2.4.2 Access

Section 36H of the act says:

- ‘36H.–(1) Subject to section 36C, the Minister may, on the recommendation of the Commission, make regulations under this section requiring a licensee having a substantial degree of power in a market to offer a particular form of indirect access or access to facilities to other licensees if–
- (a) there is a reasonable likelihood of consumer demand for alternative telecommunications licensees;
  - (b) the regulations are necessary to introduce such competition; and
  - (c) the costs for providing such service are fairly distributed among the licensees providing it and those receiving the service.
- (2) Before making any recommendations to the Minister under subsection (1), the Commission shall consult–
- (a) any licensee that would, under regulations made in terms of the recommendation, be required to offer access to other licensees; and
  - (b) the owner of any telecommunications network or facilities that would be used in connection with the provision of such access.’

<sup>25</sup> Sections 28 and 29.

<sup>26</sup> Sub-section 36F (5) – Interconnection Principles.

<sup>27</sup> Section 36G.

This is an unusual provision and does not represent best or indeed any form of practice for access arrangements. The criteria in Sub-section 36H(1) seem not to be the most relevant criteria for considering whether and in what circumstances facilities access might be desirable. There is no reference, for example, to whether the facilities might be bottleneck facilities, subject to scarcity for one reason or another, or not economically replicable. Condition (a) would almost always be fulfilled. Condition (b) is a matter entirely within the control of the commission and the minister and, in any case, should follow from a policy decision, not be a pre-condition of it. Condition (c) is a standard condition relating to appropriate compensation for facility sharing.

### 3.2.2.5 Cost modelling and benchmarking

Although the act now makes clear the costs that should be taken into account when determining interconnection charges, these have yet to be employed by the commission. The commission has not developed its own cost model and has not adopted any model prepared by or for the service providers. In fact, the commission has made it clear that certain models prepared by service providers' experts have not been accepted, although the reasons for this non-acceptance have not been stated or published.

The new pricing guidelines in Sub-section 36F(5), which relate entirely to the costs to be considered in cost modeling or other forms of cost calculation, have yet to be implemented at the commission level.

In the past, the commission has arbitrated call termination charges based on the materials and arguments that have been put by the parties. Some have offered benchmark studies in the course of their argument. The commission has indicated that it has undertaken some form of benchmark analysis, but has not published the study, the study specification or the comparator countries that were included.

There are, however, no IMR-specific cost models in Fiji.

### 3.2.2.6 IMR framework and arrangements

In Fiji, there are not any regulatory frameworks or IMR arrangements in place, and IMR guidelines have not been established.

There are also no orders or decisions of the ministerial office or regulatory authority currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place.

However, Fiji is of the view that there is a need for relevant IMR policies to be put in place.

For further information, see Chapter 6.

### 3.2.2.7 Resources and experience dedicated to IMR

In respect of staff resources allocated to IMR, a decision on this will be made when the TAF is established; as IMR responsibility in Fiji will be its issue.

While Fiji has called on the services of external experts for assistance on telecommunication issues, it has not done so for IMR specifically.

For further information, see Chapter 6.

**3.2.3 Kiribati****3.2.3.1 Country and market background**

The Republic of Kiribati is composed of 32 atolls and one raised coral island dispersed over 3,500,000 square kilometers. The estimated population in 2009 was 98,000, and 50 per cent live on South Tarawa.

The telecommunication sector has an incumbent operator, Telecom Services Kiribati Limited (TSKL) providing fixed, mobile and international gateway services, and TSKL and Television Kiribati Limited (TKL) providing Internet services.

The government has indicated that it is seeking to introduce competition into the sector and had lengthy negotiations with one potential entrant before they broke off in 2009.

**3.2.3.2 Legislative framework**

The provision of telecommunication services is governed by the Telecommunications Act 2004. Part II of the act established the Telecommunications Authority of Kiribati (Authority) and makes provision for licensing of systems and services, and the interconnection of facilities (Part III). The legislative framework, therefore, contemplates competition in the provision of network services. In particular, the act's objectives include 'promoting efficiency and competition among persons engaged in the operation of telecommunications systems and services'.<sup>28</sup>

**3.2.3.3 Regulatory framework and arrangements**

Part II of the act established the authority as an independent regulatory agency,<sup>29</sup> with a range of functions and powers including:

- (b) grant licences for telecommunication systems and services and supervise and enforce compliance with the condition of licences;
- (e) promote competition including: (i) protecting persons who provide telecommunication systems and services from practices of other persons that are damaging to competition; and (ii) facilitating the entry into the market of telecommunication systems and services by persons who wish to supply those systems and services;
- (f) regulate the interconnection between and access systems of operators of telecommunication systems (sic);
- (i) regulate rates and charges levied by operators of telecommunication systems and services.<sup>30</sup>

Section 46 of the act generally deals with appeals against the authority's decision. The decisions of the authority in exercising its powers and performing its functions under the act are final and conclusive on questions of fact. Any person aggrieved by the decision of the authority on any question of law may appeal to the High Court with the leave of that court.

**3.2.3.4 Interconnection and access****3.2.3.4.1 Interconnection**

Section 18 of the act permits operators to enter into interconnection agreements on terms and conditions on which they agree, and which have been approved by the authority. If the parties fail to agree, the authority shall at the request of any of them determine the terms and conditions.

<sup>28</sup> Paragraph 3.(1) (d).

<sup>29</sup> Section 7 permits the Minister to give directions of a general nature to the TAK in relation to the performance of its functions and the exercise of its powers.

<sup>30</sup> Sub-section 5.(1).

The authority may order the interconnection of one operator if another operator requests this.

The authority may issue guidelines on the negotiation of interconnection agreements between operators, but, so far, has not done so.

Section 19 of the act requires the provision of all telecommunication services to be in accordance with tariffs approved by the minister in consultation with the authority. The criteria for the approval of tariffs and charges (including interconnection charges, it would seem) are that they are ‘just and reasonable’, non-discriminatory, and calculated in accordance with any methods or techniques specified in guidelines issued by the authority. So far, the authority has not issued any such guidelines. However, TAK advises that proposed competition regulations for the provision of telecommunication services, which also contain provisions relating to interconnection and other wholesale services, have been developed.

The legislation does not clarify the meaning of ‘just and reasonable’ or provide any further guidance for the minister or authority. The standards of justice and reasonableness in this field are, therefore, left to the discretion of the minister and the authority.

#### **3.2.3.4.2 Access**

Access would seem to be included in the legislative coverage of interconnection. The act defines ‘telecommunications system’ as meaning ‘equipment for telecommunication’. This could conceivably refer to facilities such as towers and ducts. However, this definition might not be capable of being extended to include rights of way.

#### **3.2.3.5 Cost modelling and benchmarking**

The authority has the benefit of cost models that ITU developed for it in 2008-09 when it seemed that the entry of a second mobile operator was imminent. These models were based on a combination of cost proxies and some data from the incumbent. They would need to be reviewed and updated if used for call termination costing in future. Nevertheless, the authority has some tools available to calculate interconnection costs, should they be required for confirming the rates offered or negotiated by the parties.

The authority has not conducted a systematic benchmarking study for how call termination rates are determined, and there are no IMR-specific cost models in Kiribati.

#### **3.2.3.6 IMR framework, legislation and arrangements**

Given there is only one incumbent operator and no IMR availability in Kiribati, neither regulatory frameworks or IMR arrangements are in place nor have any IMR guidelines been established. Even so, a proposed competition regulation has been drafted for the government’s consideration.

For further information, see Chapter 6.

#### **3.2.3.7 Resources and experience dedicated to IMR**

Should IMR become an issue in Kiribati, two staff from the authority would be available to consider it.

There has been no call on the services of external experts for assistance on IMR issues in Kiribati.

For further information, see Chapter 6.

### **3.2.4 Marshall Islands**

#### **3.2.4.1 Country and market background**

The Marshall Islands has a population of approximately 62,000 and a land area of 181 square kilometres.

The Marshall Islands National Telecommunications Authority (NTA) is the sole provider of all services, and was established pursuant to the Communications Act 1987 and the Marshall Islands National Telecommunications Authority Act 1990. It is a private corporation with significant government ownership (approximately 76 per cent).

#### **3.2.4.2 Legislative framework**

The legislative framework authorises the authority to provide services. Spectrum licensing and management is retained by the government, but these powers have not been used to modify the NTA's effective monopoly on all services, including even the provision of Internet services at hotspots.

#### **3.2.4.3 Regulatory framework and arrangements**

Spectrum management and regulation is retained by the government, which oversees the operations of the NTA.

#### **3.2.4.4 Interconnection and access**

There is no current requirement for interconnection or access, and there is no network service competition in prospect that might change this.

#### **3.2.4.5 Cost modelling and benchmarking**

The results of this study indicate that no IMR cost modeling or benchmarking has been undertaken.

#### **3.2.4.6 IMR framework, legislation and arrangements**

Given that there is only one incumbent operator and no IMR availability in the Marshall Islands, no regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place.

For further information, see Chapter 6.

#### **3.2.4.7 Resources and experience dedicated to IMR**

Should IMR become an issue in the Marshall Islands, one staff member from the NTA would be available to consider it.

There has been no call on the services of external experts for assistance on IMR issues in the Marshall Islands.

For further information, see Chapter 6.

**3.2.5 Micronesia****3.2.5.1 Country and market background**

Micronesia is spread across the 607 islands of the Caroline Islands within the wider region of Micronesia. It has a population of approximately 111,000 and a land area of approximately 700 square kilometers.

**3.2.5.2 Legislative framework**

The Federated States of Micronesia Telecom Corporation (FSMTC) was established by law as a public corporation with authority to provide services and is a monopoly provider.

**3.2.5.3 Regulatory framework and arrangements**

There is no separate regulator. Policy control and supervision generally in the sector, as well as spectrum management, is with the Department of Transportation, Communication, and Infrastructure.

**3.2.5.4 Interconnection and access**

There is no current requirement for interconnection or access, and no network service competition in prospect that might change this.

**3.2.5.5 Cost modelling and benchmarking**

The results of this study lead to the conclusion that no cost modeling or benchmarking has been undertaken .

**3.2.5.6 IMR framework, legislation and arrangements**

Given that there is only one incumbent operator and no IMR availability, no regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place.

For further information, see Chapter 6.

**3.2.5.7 Resources and experience dedicated to IMR**

Should IMR become an issue in Micronesia, two staff from the ministry would be available to consider it.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

**3.2.6 Nauru****3.2.6.1 Country and market background**

Nauru has a territory of 21 square kilometers and a population of approximately 14,000.

The traditional incumbent is the Republic of Nauru Telecommunications (RONTEL) Corporation, which had a monopoly on all services, including international services. In 2009, however, a licence was granted to Digicel Nauru to provide mobile services. It is understood that the licence allows Digicel to provide fixed, international gateway and many other services as well. A mobile service was launched in August 2009.



**3.2.6.2 Legislative framework**

The Telecommunications Act 2002 established RONTTEL as a statutory corporation and sets out its obligations as the national service provider. There is no provision in the act for licensing competitive operators or for interconnection and access arrangements between operators.

In practice, RONTTEL has found it difficult to provide service on Nauru and has struggled to maintain fixed networks deployed in earlier times. Consequently the introduction of a second operator might not be competitive, but a means of providing an initial service.

**3.2.6.3 Regulatory framework and arrangements**

The act did not establish an independent agency for regulating the provision of service. By implication, the power is reserved with the government.

Digicel entered the Nauru market on the basis of a licence granted by the government. The terms of the licence, and the rights and obligations acquired by Digicel as a result, are not known. The licence is said to be confidential and not available to third parties. It is not possible, therefore, to examine the post-licence relationship between Digicel and RONTTEL, and to determine whether it is competitive.

**3.2.6.4 Interconnection and access**

As noted above, there are no arrangements for interconnection in the act, and the arrangements, if any, in the Digicel licence are considered confidential and not available to third parties.

**3.2.6.5 Cost modelling and benchmarking**

The results of this study lead to the conclusion that no cost modeling or benchmarking has been undertaken at present.

**3.2.6.6 IMR framework, legislation and arrangements**

In Nauru, no regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place. However, there is a right of appeal against the regulator's orders. These appeals are heard by the Telecommunications Tribunal. No orders have been issued with respect to IMR.

For further information, see Chapter 6.

**3.2.6.7 Resources and experience dedicated to IMR**

Nauru has indicated it has one staff member available to consider this issue.

There have been no calls on the services of external experts for assistance on IMR issues in Nauru.

For further information, see Chapter 6.

**3.2.7 Niue****3.2.7.1 Country and market background**

Niue has a population of around 1,400 and a land area of 260 square kilometres. The island of Niue is one of the world's smallest self-governing states. The 5,000 or so annual visitors to the island inject about NZ\$3.5 million into the economy.<sup>31</sup>

Telecom Niue (Niue P&T) provides fixed, mobile and international gateway services as per the Communications Act 1989. P&T is the country's largest generator of revenue.<sup>32</sup>

Internet services are provided by a private company, the Internet Users Society of Niue (IUS-N), under an agreement with the government. Internet services have been provided using Wi-Fi technology free of charge since 2003.

**3.2.7.2 Legislative framework**

The current legislation is the Communications Act 1989, and the Telephone Regulations and Radiocommunications Regulations, both of 1972. These laws and regulations are of an earlier era and the government has expressed an intention to update them. The arrangements permitting IUS-N to provide a nationwide free Internet service were developed with the government. A major incentive for this initiative was to provide connectivity to support tourism in Niue.

**3.2.7.3 Regulatory framework and arrangements**

P&T is both a service provider and a regulator. The Regulator is practically the Director of P&T.

Niue considered upgrading its analogue network to a GSM system but the cost would have been prohibitive for such a small population, and this proposal has not proceeded. An aim of the Niue National Strategic Plan is to have GSM coverage by 2012.

**3.2.7.4 Interconnection and access**

The government has given permission to a private potential operator to test its GSM mobile facilities in Niue. The conditions that apply to that approval are considered confidential and, therefore, it is not known whether any interconnection arrangements or charges are to be contemplated, or, if so, what they might be.

The free Internet access service is not accessible via dial-up telephone services, and no interconnection or access arrangements with Telecom Niue are in place, or required for the current mode of operation.

**3.2.7.5 Cost modelling and benchmarking**

The results of this study indicate that no cost modeling or benchmarking has been adopted at present.

**3.2.7.6 IMR framework, legislation and arrangements**

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place. However, there is a right of appeal to cabinet.

<sup>31</sup> Budde (2010).

<sup>32</sup> Niue Communications Act (1989).

Niue has indicated that it intends to have IMR available when the 2.5G GSM mobile network is operational.

For further information, see Chapter 6.

### **3.2.7.7 Resources and experience dedicated to IMR**

Niue has indicated it has one staff member available to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

## **3.2.8 Palau**

### **3.2.8.1 Country and market background**

The Republic of Palau occupies islands that have an aggregate land area of 460 square kilometres with a population of around 20,000. About two-thirds of the population lives on the island of Koror.

Fixed, mobile, Internet and international services are provided by the incumbent, the Palau National Communications Corporation (PNCC), a private company incorporated in 1982. Palau Mobile Corporation (PMC) also provides mobile services.

### **3.2.8.2 Legislative framework**

Legislation is in place that governs the operations of the PNCC, and its powers and duties in the course of providing services. However, this legislation does not provide a framework for the competitive provision of telecommunications.

### **3.2.8.3 Regulatory framework and arrangements**

Because the telecommunications sector is not regulated at all, except in relation to spectrum, neither PNCC nor PMC are required to have telecommunication operating licences. PMC has been separately authorized to provide mobile services by the government. As a foreign corporation, PMC was required to obtain a Foreign Investment Board (FIB) business licence as a preliminary matter before being issued with service provider, frequency spectrum and earth station licences by the government.

The sector is overseen by the Communications Division of the Ministry of Infrastructure, Industries and Commerce.

### **3.2.8.4 Interconnection and access**

There are no access or interconnection arrangements between PNCC and PMC, and it would seem that none are contemplated in the near future. The ministry explains that a subscriber to PMC's cellular service is not authorized to call a PNCC cellular service unless the call is made as a long distance call. This is due to restrictions in PMC's foreign investment permit, under which PMC is only authorized to provide international direct dial services. PMC is not permitted to provide national call services.

### **3.2.8.5 Cost modelling and benchmarking**

The results of this study lead to the conclusion that no cost modeling or benchmarking has been undertaken at present.

**3.2.8.6 IMR framework, legislation and arrangements**

Regulatory frameworks and IMR arrangements are not in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place.

For further information, see Chapter 6.

**3.2.8.7 Resources and experience dedicated to IMR**

Palau has indicated it has not allocated a staff member to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

**3.2.9 Papua New Guinea****3.2.9.1 Country and market background**

Papua New Guinea, with an estimated population of 6,732,000 in 2009 and a land area of 463,000 square kilometres, is the largest of the Pacific Island countries in this study. The capital, Port Moresby, has over 250,000 people, and the extent of urbanization is less than anywhere else in the Pacific.

The telecommunication market is served by Telikom Papua New Guinea Limited (Telikom), the incumbent general carrier, licensed to provide national fixed and international services. There is competition in the public mobile services market between B Mobile (the Telikom-affiliated service provider) and Digicel Papua New Guinea Limited (Digicel). There are approximately ten licensees in the value-added services market.

**3.2.9.2 Legislative framework****3.2.9.2.1 General**

Papua New Guinea is moving from an existing legislative arrangement in the Telecommunications Act 1996 to a new scheme, which is based on the National Information and Communications Technology (NICT) Act 2009. The powers under this new act will be exercised through a new National Information and Communications Technology Authority (NICTA), which will replace the current regulator, PANGTEL. The NICT Act 2009 seeks to introduce a new telecommunication and broadcasting operator regime. It mandated that NICTA assume the regulatory responsibilities of its current telecommunications watchdog, PANGTEL, and those of its IT authority, the Independent Consumer and Competition Commission (ICCC).

The current 1996 act makes substantial and detailed provision for interconnection and for the resolution of disputes if potentially interconnecting service providers cannot negotiate terms on a commercial basis. The policy for interconnection in Papua New Guinea, as embodied in the Telecommunications Act 1996 is to give primacy to the commercial negotiations of the carriers if that can be achieved. A licensed carrier has the right to interconnect its facilities to the network of any other carrier under Sub-section 82(1) of the act on such terms and conditions as the carriers agree on.<sup>33</sup>

<sup>33</sup> Paragraph 82(1) (b).

In this regard, the policy was based on an approach taken in Australia and elsewhere. The Australian experience since the mid-1990s has been to show how difficult and protracted interconnection negotiations and disputes can become, particularly if the timetable is left in the hands of various service providers. There are invariably ample opportunities for gaming, and substantial commercial incentives for one or both parties to do so.

In the absence of agreement between them, one or both of the parties may apply to the regulator, the ICCC,<sup>34</sup> for a dispute to be arbitrated. Regulator arbitration was adapted from the regulatory framework in Australia and some other countries. At the time of the Papua New Guinea legislation, there was little experience of regulator arbitration on interconnection and access disputes in Australia. The history since then confirms that arbitration is a resource-intensive and protracted process. In Australia, the back-log of arbitrated disputes grew substantially after 1997.

As noted, the primary and preferred mechanism for interconnection is by commercial negotiation and agreement by the parties. However, there are two additional arrangements under the act. The first involves arbitration by the ICCC, and the second, if the parties and the ICCC fail to deliver a timely outcome, is determination by the minister.

### 3.2.9.2.2 The ICCC's powers

The ICCC has power under section 84 of the act to determine by arbitration those interconnection matters in dispute that one or both of the parties has submitted to it.<sup>35</sup> A determination by the ICCC is required to specify the facilities and the networks concerned, set out the terms and conditions of the interconnection, and be consistent with the act, with charging principles determined under section 86 of the act, and with government policy.<sup>36</sup>

The terms and conditions must relate only to technical standards for interconnection, points of interconnection, supply of facilities for the purposes of interconnection and carriage, supply of traffic information and other information necessary for the purpose, charges payable for interconnection and carriage, and any matter incidental to the foregoing.

Section 86, referred to above, provides that 'the regulatory contract or the licence of a carrier may set out principles that are to be applied in agreeing on or in determining terms and conditions about charges payable by a carrier to another carrier from whom access is being sought' for, among other things, interconnection and carriage of communications across networks.<sup>37</sup>

Telikom's regulatory contract requires the ICCC to consider the following points when determining access and interconnection charges:

- (a) the directly and indirectly attributable incremental capital costs incurred by Telikom in connection with the provision of the access and interconnection, and including economic depreciation costs associated with the asset base, for those assets used directly and indirectly to provide the access and interconnection;
- (b) the directly and indirectly attributable operating costs incurred by Telikom in connection with the provision of the access and interconnection;
- (c) full recovery of one-off incremental operational and capital costs incurred in the provision of the access and interconnection which Telikom would not have otherwise incurred but for the requirement to provide the access and interconnection;

<sup>34</sup> Established in 2002 under its own legislation, the ICCC Act.

<sup>35</sup> Sub-section 84(1).

<sup>36</sup> Sub-section 84(3).

<sup>37</sup> Sub-section 86(1).

- (d) the requirement for a fair and reasonable contribution to the common costs incurred by Telikom;
- (e) the availability and capacity of the telecommunications network operated by Telikom to provide the access and interconnection and the timeframe reasonably required to provide access to additional capacity;
- (f) any other factors the Commission considers relevant.<sup>38</sup>

Clearly it is intended that the ICCC should regard cost factors when determining interconnection charges, although it may take into account other factors under item (f).

The 2008 amendments to the act empower the ICCC to make an interim determination effective for a period of 12 months.<sup>39</sup> This measure was clearly designed to facilitate quicker outcomes.

### **3.2.9.2.3 The minister's powers**

Amendments were made to the act in early 2008 including, in section 84A, giving the minister the power to determine matters affecting interconnection and the carriage of communications between networks.

The ICCC can only arbitrate if the parties have a dispute in the course of negotiating an access agreement, and one or both of them refer the matter to the ICCC. If the parties fail to refer a matter, the ICCC cannot intervene.

This situation was considered to be unsatisfactory because the overall public interest requires that interconnection should be put in place and be effective from the earliest time. In the normal course, interconnection of networks is an expression of the any-to-any connectivity principle which in turn expresses the entitlement and expectation of any user to call and be called by any other user no matter which network the user is connected to. The any-to-any connectivity principle may, therefore, be seen as a kind of consumer right. In addition, however, consumers have an interest in the establishment of effective competition. This is not normally possible without interconnection because smaller carriers, usually new entrants, will have difficulty in acquiring customers and selling their services. In this respect, size and reach matters.

The act was amended in April 2008 to include section 84, which empowers the minister to determine terms and conditions for interconnection of networks and the carriage between them. Interconnection by the carriers concerned must occur within 28 days of the determination.<sup>40</sup> The minister's power is confined by a requirement that before making a determination, a consultation must take place between with the ICCC, PANGTEL and the carriers concerned. The minister is not required to consider costs or any other matter in exercising the power. In fact, this is spelled out clearly in Sub-section 84A (4):

'(4) Nothing in Sub-section (1) limits the generality of the Ministerial Determination.'

<sup>38</sup> Telikom Regulatory Contract, clause 2.6. Similar clauses are found in Telikom's General Carrier Licence (Clause 19.3); Telikom's Public Mobile Licence (Clause 14.3); and Digicel's Public Mobile Licence (Clause 15.4).

<sup>39</sup> Sub-sections 84 (6) to (12).

<sup>40</sup> Sub-section 84A(2).

However, the minister's power must be read subject to section 82, in which it is clear that if the parties fail to agree, terms and conditions of interconnection shall be as in an ICCC determination or 'as are determined in a Ministerial Determination but are not the subject of a Commission Determination.'<sup>41</sup> In other words, the priority is: parties' agreement; ICCC determination; and ministerial determination, in that order. If there is an ICCC determination then this, in effect, overrides a ministerial determination to the extent that they cover the same topics. This might be better described as suspending the operation of a ministerial determination to the extent that they cover the same topics. If there is a prior ICCC determination, then a subsequent ministerial determination on the same matters will be to no effect. So far as is known, the minister has not exercised these powers to date.

### 3.2.9.3 Regulatory framework and arrangements

Two regulatory frameworks have been developed and published governing interconnection:

- Telecommunications Interconnection Code of Practice – by ICCC;
- Technical Interconnection Code of Practice – by PANGTEL.

PANGTEL is the technical and administrative regulator of the industry. Its code of practice sets out standard technical terms that govern the interconnection and interoperation of networks. The code reflects best practice and incorporates international technical standards, as appropriate.

The ICCC Code, published in November 2006, is more relevant to the themes of the current study. It was prepared after a process of industry consultation as prescribed in the act. The code seeks to elaborate on the principles and processes set out in the act.

Of particular interest is a paragraph from section 2.2.1:

'The Commission's final determination of the charges for access and interconnection must be made available to PANGTEL and the public but must not disclose confidential data provided to the Commission by the Access Provider and Access Seeker for the purposes of its determination.'

Unfortunately, in the only interconnection agreement that has been entered into, this provision has not been applied.

The code also sets out and elaborates the contents that should be in an access agreement. In addition, the code sets out the pricing principle that the ICCC will apply if it is called upon to determine disputes about access and interconnection pricing. The principle, as stated, usefully builds on the provisions of the act in a way that reflects prevailing best practice:

'Where the Access Provider and the Access Seeker fail to reach agreement on a commercial basis as to the charges payable for access and interconnection, and the Commission is required to determine the matter pursuant to section 84 of the Telecommunications Act, in determining the charges for access and interconnection the Commission shall have regard to the following factors:

- (a) the directly and indirectly attributable incremental capital costs incurred by the Access Provider in connection with the provision of the access and interconnection services to the Access Seeker(s), being a reasonable return on the written down asset base, and including economic depreciation costs associated with the asset base, for those assets used directly or indirectly to provide the access and interconnection;
- (b) the directly and indirectly attributable incremental operating costs incurred by the Access Provider in connection with the provision of the access and interconnection;

<sup>41</sup> Paragraph 82(1) (b) (ii).

- (c) full recovery of one-off incremental operational and capital costs incurred in the provision of the access and interconnection which the Access Provider would not have otherwise incurred but for the requirement to provide the access and interconnection;
- (d) the requirement for a fair and reasonable contribution to the common costs incurred by the Access Provider;
- (e) the availability and capacity of the telecommunications network operated by the Access Provider to provide the access and interconnection and the timeframe reasonably required to provide access to additional capacity; and
- (f) any other factors the Commission considers relevant.<sup>42</sup>

The code goes on to reassert the principle that the charges should be published.<sup>43</sup>

Finally, the code sets out a detailed procedure for arbitration and the timescales that the ICCC will follow for each stage.

There is an awareness of arbitration, but it is not known the extent to which the ICCC followed its own procedure and timing.

### **3.2.9.4 Interconnection and access**

#### **3.2.9.4.1 Interconnection**

As already noted, there has been one interconnection agreement entered into, between Telikom and Digicel. The carriers could not agree on various aspects of the agreement relating to charging and these issues were settled, after a protracted process via ICCC arbitration.

#### **3.2.9.4.2 Access**

According to the ICCC, no access agreements have been registered at all.

### **3.2.9.5 Cost modelling and benchmarking**

The ICCC reports that it has employed cost modelling in the course of settling interconnection charging disputes and also benchmarked the rates in countries considered to be similar to Papua New Guinea. The cost model(s) and benchmark studies have not been made public nor have any details been released. It is therefore not possible to say whether they have been prepared on best practice principles.

There are no IMR specific cost models in Papua New Guinea, but its response was that any IMR modelling should be cost based.

### **3.2.9.6 IMR framework, legislation and arrangements**

As indicated in section 3.2.9.2.1, the Telecommunications Act 1996 (as amended) will be replaced by the NICT Act 2009 on 30 September 2010.

Currently, the ICCC considers IMR issues and will do so until 30 September 2010, following which the NICT Act 2009 will come into full effect and NICTA is created. It will then assume responsibility for this issue.

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established. However, there is an obligation on dominant service providers to obtain prior approval from the regulator's office for proposed tariffs.

<sup>42</sup> Clause 5.2.1 of the ICCC Code.

<sup>43</sup> Clause 5.2.2 of the ICCC Code.



There are also no orders or decisions of the minister's currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place. However, there is a right of appeal against any of the regulator's orders, and these appeals are heard by the ICT Appeals Panels.

For further information, see Chapter 6.

### 3.2.9.7 Resources and experience dedicated to IMR

Papua New Guinea has indicated that it has not allocated a staff member to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

## 3.2.10 Samoa

### 3.2.10.1 Country and market background

Samoa has a population of around 179,000 and a land area of 2,831 square kilometres. Approximately two thirds of the population lives on Upolu and the balance on Savaii and smaller islands.

The telecommunication market has been progressively liberalized since 2005, and there is competition in the provision of mobile, international gateway and Internet services, as indicated in Table 2. As of July 2009 the policy in place is that all services shall be liberalized and the exclusive provision of services by SamoaTel effectively ended in all telecommunication markets.

**Table 2: Service providers and markets in Samoa**

Telecommunication service markets	Service providers
Fixed	SamoaTel
Mobile	SamoaTel; Digicel Samoa Limited
Internet	CSL and a number of smaller ISPs
International gateway	SamoaTel; Digicel Samoa Limited; Wimax Samoa Limited

### 3.2.10.2 Legislative framework

To provide the required legislative framework for the then-pending liberalization of the telecommunication sector in Samoa, the legislative assembly passed the Telecommunications Act in 2005. The act established the Office of the Regulator and also set up the framework for the introduction of competition in many parts of the market. Experience soon showed the need for improvements and the act went through a series of improvements and amendments, the most recent being in 2008.

The act was amended in 2008 as a response to the Digicel legal appeal to the Supreme Court regarding long-term interconnection rates, which the regulator tried to implement after a cost study was completed.

As a result of the Digicel court case, it was decided that the act needed to address issues surrounding the establishment of interim interconnection rates. It was also decided that there needed to be a special body that appellants could appeal directly to rather than have appeals heard in the Supreme Court, which does not have the background knowledge needed to hear telecommunication matters. As a result, the Telecommunications Tribunal was established as an administrative appellate body.

Further amendments to the act are being considered, based on proposals from the regulator. Possible amendments include:

- further clarifications of the provisions on appeals and judicial process, and the operation of barriers to appeal;
- mediation processes;
- the nature of the regulator’s independence whilst being subject to the Public Service Commission;
- whether or not rates can be set retrospectively;
- the regulator’s role in policy making and the relationship of this with the regulator’s implementation role.

The act sets out a range of objects that require optimization in many situations.<sup>44</sup> These include:

- ‘(c) promote the efficient and reliable provision of telecommunication services, relying as much as possible on market forces, such as competition and private sector investment, to achieve this objective;
- (e) encourage sustainable foreign and domestic investment in the telecommunication sector;
- (f) establish a framework for the control of anti-competitive conduct in the telecommunication sector;
- (g) promote efficient interconnection arrangements between service providers.’

### 3.2.10.3 Regulatory framework and arrangements

The regulator is given the functions and power to implement the act and regulations, and other elements of the legal and regulatory framework,<sup>45</sup> including specific power to regulate interconnection.<sup>46</sup>

Like many of the nations of the Pacific region, Samoa does not have separate and general competition legislation governing all sectors of the economy. Part VI of the act provides for competition policy in relation to the telecommunication sector, including detailed provisions for the designation of dominant service providers, abuse of dominance, other anti-competitive practices (other than the abuse of dominance in a market), and remedies for abuse of dominance and anti-competitive practices.<sup>47</sup> There is nothing exceptional about these provisions.

Part VII of the act deals with interconnection. Section 32 requires the regulator to ‘promote adequate, efficient and cost-oriented interconnection of telecommunication networks and access by service providers to telecommunication facilities of other service providers’, to permit interoperability, and promote the development of competitive telecommunication service markets.<sup>48</sup> The act provides processes and established rights in relation to interconnection.

<sup>44</sup> Section 3.

<sup>45</sup> Paragraph 8(1)(b).

<sup>46</sup> Paragraph 8(1)(i).

<sup>47</sup> Sections 26 to 30 inclusive.

<sup>48</sup> Section 32(a).

## Section III

Section 36 deals with interconnection charges and requires that the ‘interconnection charges of dominant services providers [...] shall be cost-based’ but empowers the regulator to phase in such rates over time ‘taking into account the financial impact on the affected dominant service provider’.<sup>49</sup> That the charges should be cost-based is unexceptional, but it is curious that glide paths might be considered on the basis of the impact on the dominant service provider. The provision is likely to be read more broadly and enable the regulator to take account of other factors as well, because it does not say that ‘only’ the impact on the dominant service provider is a factor. Other stakeholders, such as the other service provider(s) involved, together with consumers, have legitimate interests that might be affected by staged implementation of cost-based interconnection rates.

An amendment to the act inserted section 39A which empowers the regulator, subject to compliance with an expeditious consulting procedure, to impose interim interconnection charges. These need not be cost based, under section 36.<sup>50</sup> However, the Telecommunications Tribunal in May 2009 confirmed that the requirements of section 32 still applied to interim interconnection rates, and, therefore, they should be cost-oriented. Section 39B enables the regulator to impose such charges in the absent of agreement between service providers.

Section 37 requires every dominant service provider to prepare for regulatory approval, publish a reference interconnection offer, and to update this periodically. The offer must comply with the regulator’s orders and guidelines. Although specific regulator approval is not required for the offer, the process considered as a whole enables the regulator to effectively do that using other processes of control.

Section 38 requires the publication of interconnection agreements, save for information claimed to be confidential and adjudged to be confidential by the regulator. Interconnection agreements must comply with the act and other regulations and orders, and the regulator may order amendments if they are found not to comply.<sup>51</sup>

#### 3.2.10.4 Interconnection and access

The legislative and regulatory arrangements for interconnection and access have been described above.

In practice, the development of implementation and access orders and the actual implementation of them have been far more difficult in Samoa than might be suggested by the current legislation. As noted, the legislation has been modified to reduce future involvement of the courts in the interpretation of interconnection requirements and the regulator’s powers.

The history of interconnection rate setting in Samoa involves several changes of direction as a result of appeals to the Supreme Court and the Telecommunications Tribunal.

- Competition commenced in 2006 with the licensing of Digicel and its acquisition of the incumbent mobile service. The regulator set fixed- and mobile-call termination rates on an interim basis based on a benchmark study.
- At the same time, the regulator retained consultants to develop cost models for calculating the costs of call termination. Digicel appeal to the Supreme Court, which granted orders to prevent implementation of the consultant’s results on the basis of procedural flaws. The benchmarked rates continued to apply.
- The regulator sought to extend the benchmarked rates through two orders in the second half of 2009 and the first half of 2010, pending the completion of new cost models by consultants retained by the regulator.

<sup>49</sup> Sub-section 36(1).

<sup>50</sup> Sub-section 39A(9).

<sup>51</sup> Section 38.

- SamoaTel challenged the orders before the tribunal, which struck them out on the basis that they were not cost-oriented as required by the act. The tribunal directed the regulator to prepare new orders.
- The tribunal’s decision was unsuccessfully challenged by Digicel before the Supreme Court.
- The regulator has issued replacement orders for the interim orders that were overturned by the tribunal, and is now in the process of preparing orders of longer-term effect.

There are no regulations for interconnection or for infrastructure sharing at this stage. There are also not any published guidelines but the process for setting rates has now been established through several court cases and a tribunal ruling. The Office of the Regulator is in the process of documenting the lessons learnt and recommended procedures based on the process.

### **3.2.10.5 Cost modelling and benchmarking**

Arrangements in the act provide that all interconnection charges must be cost-oriented (including rates provided for in interim interconnection orders) and that the interconnection charges of service providers designated as dominant in a market shall be cost-based.

In Samoan practice, ‘cost-oriented’ has come to be associated with such methodologies as benchmarking. In other words, there is a sufficient relationship with costs if the charges in Samoa are based on comparison with charges in other countries that have been based on cost studies, and where those other countries are considered likely to have costs similar to those in Samoa.

‘Cost-based’, on the other hand, relates to the costs in Samoa. The appropriate methodology to determine those costs is through the preparation of a suitable cost model.

The regulator has used benchmarking studies to determine call termination costs in 2006, and again in 2010 when determining the rates to be included in the replacement orders for the orders overturned by the tribunal. On the latter occasion, there was a consultation on both the orders and the benchmark study used in the process.

The regulator has retained a consultant to develop cost models for fixed and mobile call termination. These models are scorched earth, bottom up, LRIC models, which include mark-ups for indirect, common and overhead costs. Stakeholders have had the opportunity to examine and make submissions on the models and on the assumptions used in them.

There are, however, no IMR specific cost models in Samoa.

### **3.2.10.6 IMR framework, legislation and arrangements**

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established. However, there is an obligation on dominant service providers to obtain prior approval from the Office of the Regulator for proposed tariffs.

There are also not any orders or decisions of the Office of the Regulator currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders is in place. However, there is a right of appeal against any orders of the regulator, and these appeals are heard by the Telecommunications Tribunal.

For further information, see Chapter 6.

### **3.2.10.7 Resources and experience dedicated to IMR**

Samoa has indicated it has three staff members available to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

### **3.2.11 Solomon Islands**

#### **3.2.11.1 Country and market background**

The Solomon Islands covers a land area of 28,400 square kilometres and has a population estimated at 552,400 in 2006. Approximately ten per cent live in the capital and largest city, Honiara.

The Solomon Islands is one of the least connected countries in the world according to the World Bank. Total population covered by telecommunication networks (fixed and mobile) is about 60,000 (around 11 percent). This compares to over 90 percent population coverage in Samoa, and over 80 percent in Vanuatu. As of March 2009, there were 12,000 fixed lines in service and 35,000 mobile subscribers.

Fixed and mobile services are provided by the monopoly operator, Solomons Telecommunications Limited (STL, also known as Our Telekom). Bemobile Ltd also provides mobile services. Internet access is primarily via dial-up, although a small high-frequency radio email service is available in some locations through a non-governmental organization, People First Network. There are fewer than 1,000 broadband (DSL) subscribers. Prepaid wireless LAN access is available in Honiara in 33 selected Wi-Fi hotspots.

#### **3.2.11.2 Legal and regulatory framework**

The government's policy is to improve telecommunication services by liberalizing markets and harnessing competition. In accordance with this policy, the government initiated the process of developing new telecommunication legislation, and invited the shareholders of STL to renegotiate the terms of their exclusive license in late 2008. The negotiations concluded in June 2009 with the signing of a settlement agreement to terminate STL's monopoly, phase in competition, and transfer regulatory functions such as spectrum and numbering management to a new, independent regulator. The new telecommunications act was enacted by Parliament on 27 August 2009, and gazetted. The new mobile operator Bemobile Ltd commenced commercial operations in April 2010. Other segments of the telecommunication market (international gateway and Internet service provision) will also be liberalized.

While some aspects of regulation (interconnection, spectrum and numbering) have been incorporated into the settlement agreement, a complete set of sector regulations will need to be prepared and implemented.

#### **3.2.11.3 Regulatory framework and arrangements**

##### **3.2.11.3.1 Regulator**

The act established the Telecommunications Commission as the regulatory agency. The government has recently completed an internationally competitive recruitment process and appointed a commissioner in December 2009. The establishment of the regulatory agency and of details of the regulatory framework are ongoing. The act requires the regulator to be independent and for decisions to be impartial.

(1) The Telecommunications Commission must—

- (a) act in a manner that is independent of, separate from, and not accountable to any person or service provider, including any service provider in which the Country of Solomon Islands or Solomon Islands National Provident Fund holds an interest; and

- (b) make determinations, orders and regulations, and follow procedures, that are impartial with respect to all service providers.<sup>52</sup>

### 3.2.11.3.2 Mobile Competition

The government launched a tender for a second mobile licence to be awarded before the end of 2009. On 17 December 2009, the government announced that the second 15-year licence had been awarded to Bemobile Ltd, over other bidders including Digicel. The new mobile operator commenced commercial operations in April 2010. Bemobile Ltd also provides mobile telecommunication services in Papua New Guinea.

### 3.2.11.4 Interconnection and access

The principal objects are set out in sub-section 3(2) of the 2009 act. The first two paragraphs in particular establish the competition principles to be applied:

‘The objectives in subsection (1) shall be implemented by means of, and all determinations, orders and regulations made under this Act must be made with a view to–

- (a) establishing and maintaining an open, non-discriminatory, competitively and technologically neutral, objective, transparent and proportionate regulatory regime applicable to service providers;
- (b) providing conditions for fair and effective competition among service providers in Solomon Islands.<sup>53</sup>

Part IX of the act deals specifically with interconnection and access. Section 64 establishes the right of service providers to negotiate interconnection agreements among themselves. Section 65 establishes the rights and obligations of service providers to require and provide interconnection services of and to each other, including access to related facilities, systems and services. Section 66 deals with access to essential facilities, a term that is very usefully defined in section 2:

‘Essential facility means a facility satisfying all of the following criteria: (i) the facility is owned or controlled by a service provider; (ii) the facility is essential for the provision of telecommunications services by another service provider; (iii) for economic, technical or legal reasons the service provider requesting access cannot reasonably duplicate the facility; (iv) the lack of access to the facility presents a barrier to entry into the market of a new service provider or to expansion of an existing service provider; (v) there is likely to be significant demand from users or potential users for the telecommunications services for which access to the facility is required; and (vi) it is technically, economically and legally feasible for the service provider that owns or controls the essential facility to provide access to it.’

This definition enables service providers to make their own assessment of whether a facility is essential in the requisite sense and to demand such facilities of each other. However, the commission may, if required, determine that a facility is essential.<sup>54</sup> The right to apply for and the obligation to provide access to essential facilities does not come into force until the fourth anniversary of the launch of a new entrant service provider,<sup>55</sup> and thereafter only applies subject to the decision of the commissioner that access is necessary to further the objects of the Act in section 3.

<sup>52</sup> Sub-section 14(1).

<sup>53</sup> Sub-section 3(2)(a) and (b).

<sup>54</sup> Sub-section 66(3).

<sup>55</sup> Sub-section 66(4).

Section 67 empowers the commission to require service providers to prepare, update and revise for approval by the commission reference offers. Reference offers must cover such matters as determined by the commission<sup>56</sup>, and to be in the form of a model agreement.<sup>57</sup>

Access and interconnection agreements must be filed with the commission, which in turn is required to publish them on its website.<sup>58</sup> Section 30 deals generally with confidential information and related claims. The section provides that ‘details of prices for interconnection and access in interconnection and access agreements shall not be considered confidential’.<sup>59</sup>

### 3.2.11.5 Price regulation

Section 72 deals with price regulation. The act defines price to include wholesale prices, and therefore prices relating to access and interconnection:

“Price” means financial consideration charged to a user for the provision of a telecommunications service or access, whether on a wholesale or retail basis.<sup>60</sup>

Section 72 spells out in detail how the commission may regulate the prices of dominant service providers, and the methodology to be employed for price-setting. The act authorizes the commission-set prices based on benchmarks that meet statutory specifications, and also to accede requests for cost modelling and other methods, provided the costs are borne by the service provider requesting such methods:

- (1) The Telecommunications Commission may, on application or on its own motion, regulate the prices of services provided by a dominant service provider in a telecommunications market with reference to relevant benchmarks in accordance with subsection (2).
- (2) “Relevant benchmarks” shall be determined by–
  - (a) reviewing prices of services substantially similar to those services being assessed, derived from jurisdictions in which–
    - (i) a reasonable level of competition exists in the provision of the services in question; or
    - (ii) prices of the services in question are set on the basis of economically efficient costs, including a reasonable return on investment; and
  - (b) taking into account adjustments to reflect the relative economic and social development, demographics, geography, state of development of the telecommunications sector and differences in the cost of providing telecommunications services in Solomon Islands and such other factors as the Telecommunications Commission considers appropriate.
- (3) On application of an interested service provider, the Telecommunications Commission–
  - (a) may regulate the prices of services provided by a dominant service provider in a telecommunications market with reference to detailed information about service providers’ costs including based on cost models in addition to or instead of having regard to relevant benchmarks in regulating the prices of telecommunications services in accordance with subsection (1);
  - (b) must revise any method of price regulation then in force under this section if necessary to ensure that a service provider whose economically efficiently incurred costs have increased for reasons beyond its reasonable control can recover such increased costs,

<sup>56</sup> Paragraph 67(1)(a).

<sup>57</sup> Sub-section 67(2).

<sup>58</sup> Section 70.

<sup>59</sup> Sub-section 30(4).

<sup>60</sup> Section 2.

- (c) Provided that the applicant shall bear in advance the reasonable costs of the Telecommunications Commission, including any independent experts the Telecommunications Commission may in its sole discretion engage [such experts as may be] required to conduct a process to review and evaluate information provided in connection with paragraphs (a) and (b)
- (4) The initiation of a process referred to in subsection (3) shall not prevent the Telecommunications Commission from regulating prices with reference to relevant benchmarks in accordance with subsection (1).
- (5) Any price regulation introduced upon completion of a process referred to in subsection (3) shall not apply retroactively.
- (6) Price regulation under this section may include without limitation applying a price cap method of regulation, the glide path method of regulation, both of the foregoing or such other method of regulation as the Telecommunications Commission considers appropriate.<sup>61</sup>

The relevant sections of the act have been quoted here because they set out very clearly not only the methods to be employed, but the conditions under which they may be used.

#### **3.2.11.6 Cost modelling and benchmarking**

The results of this study conclude that no cost modeling or benchmarking have been undertaken at present.

#### **3.2.11.7 IMR framework, legislation and arrangements**

Nor regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister's office or the regulatory authority currently in force relating to IMR. However, there is a right of judicial review before the High Court, as well as to a dispute and appeals panel.

For further information, see Chapter 6.

#### **3.2.11.8 Resources and experience dedicated to IMR**

The Solomon Islands have advised that it has three staff members available to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

### **3.2.12 Timor-Leste**

#### **3.2.12.1 Country and market background**

Timor-Leste, commonly known as East Timor, has an estimated population of 923,000 (based on the 2007 census) and a land area of 15,400 square kilometres. Around 20 per cent of the population lives in Dili.

The telecommunication infrastructure of Timor-Leste was effectively destroyed during Indonesia's occupation. As the Communications Regulatory Authority (ARCOM) notes on its website:

'East Timor is one of the very few countries in the world where there is no existing (monopoly) operator, where there is no fully functioning infrastructure and a very underdeveloped market.

<sup>61</sup> Section 72.



‘It is therefore not possible to compare the situation in East Timor with that in other countries let alone apply the same solutions. Therefore solutions and a process of development will need to be introduced which are unique to East Timor.’<sup>62</sup>

Fixed, mobile, Internet and international gateway services are provided by Timor Telecom. Timor Telecom is operating on an exclusive basis in relation to fixed, mobile, and international services. iNet also provides Internet services.

The government is committed to liberalization and privatization of the sector. However, in the case of mobile, the most likely service prospect for early liberalization, ARCOM notes<sup>63</sup> ‘Although the Government at this stage does not consider that the market can support a second mobile operator [...] there is not a priori decision to restrict the market and the government may consider issuing a license for a second mobile operator at some time in the future.’

### 3.2.12.2 Legislative framework

Telecommunications legislation has been drafted but not yet enacted. It includes provision for interconnection and related access arrangements. In the meantime, ARCOM (Autoridade Reguladora das Comunicações) continues to operate under the immediate post-independence decree arrangements. It was established under Decree Law 12/2003.

### 3.2.12.3 Regulatory framework and arrangements

As noted above, regulation of the sector (effectively a monopoly arrangement) is with the authority established following independence, ARCOM. However, in practice, there is not an established legal framework for competition, access and interconnection, and no network service competition to which it might be applied, at this stage.

### 3.2.12.4 Interconnection and access

ITU developed a draft interconnection policy for Timor-Leste in 2008. This policy reflects overall best practice, consistent with the views on best practice in this report. The draft policy and related draft regulations reflect the ‘negotiate/arbitrate’ model, and provide for reference interconnection offers to be developed and published. In the case of access to designated facilities, a similar approach, including the use of reference access offers, was also proposed.

The ITU mission also reported in February 2008 on the pricing methodologies that could be adopted by ARCOM when called upon to establish retail and wholesale prices. The recommendation was for a TSLRIC approach in the longer term, but retail-minus and retail benchmarking in the shorter term.

### 3.2.12.5 Cost modelling and benchmarking

**The results of this study lead to the conclusion that cost modelling and benchmarking have not been undertaken at present.**

There are also no IMR specific cost models in Timor-Leste.

### 3.2.12.6 IMR framework, legislation and arrangements

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

There are also no orders or decisions of the minister’s office or the regulatory authority currently in force relating to IMR.

<sup>62</sup> Government of Timor-Leste (2011).

For further information, see Chapter 6.

### 3.2.12.7 Resources and experience dedicated to IMR

Information is awaited from Timor-Leste on this aspect.

### 3.2.13 Tonga

#### 3.2.13.1 Country and market background

Tonga has a population of around 104,000 in 36 inhabited islands. The archipelago's total land mass is 748 square kilometres. Around 35 per cent of the population lives in the capital, Nuku'alofa.

Local and international telecommunication services are provided by Tonga Communications Corp (TCC), which also operates the ISP Kalianet, and a GSM 900 mobile network. In addition, an emerging second carrier, Shoreline Communications (TonFon), has been building a hybrid GSM-VSAT-IP-based system to deliver low-cost voice, video, data, internet, entertainment and wireless services throughout Tonga. Digicel one of the mobile operators in Tonga acquired TonFon, the local operator, in late December 2007 and re-launched as Digicel in 2008. Liberalization has resulted in a significant increase in teledensity<sup>63</sup> and substantial reduction in prices.

The licensed service providers in Tonga are:

- a. Fixed services – TCC;
- b. Mobile services – TCC and Digicel;
- c. Internet services – TCC, Digicel, and Pacific Rural Internet Connectivity System (RICS);
- d. International gateway services – TCC, Digicel, RICS (for some schools), USPNet (only on the University of the South Pacific campus).

#### 3.2.13.2 Legislative framework

The Communications Act 2000 governs the telecommunication sector. The act's objectives are set out in section 4, and include:

- (a) to establish a communications licensing and regulation frame work in support of the national development policy objectives;
- (b) to establish the powers and functions of the Department of Communications;
- (c) to consolidate the regulation and policy control of the communications sector in a single Government department;
- (e) to establish and to promote competition in the supply, installation, maintenance and operation of customer equipment and related services;
- (f) to promote fair and sustainable competition in the supply and provision of network facilities, network services and applications services.'

<sup>63</sup> 'Teledensity' is an **index of numbers of telephone lines**: a measure of telephone availability, expressed as the number of main lines per 100 inhabitants in a country). The fixed teledensity in 2008 was 25% and the mobile teledensity in 2008 was 50% (CIA Fact Book).

## Section III

The minister and Department of Communications have both policy and regulatory functions. The minister has the power ‘to exercise general supervision and control over all matters relating to the communications sector in the Kingdom’,<sup>64</sup> and to ‘make determinations on any matter specified as being subject to the Minister's determination under this Act, the Radio-communication Act (Cap 98), the Telegraph Act (Cap 99), and other applicable laws.’<sup>65</sup>

The act says that ‘a licensee must provide all its services in accordance with the written tariffs which are filed and approved by the Department pursuant to section 45(2).’<sup>66</sup> It is not clear what criteria apply for the approval of tariffs, other than they must be ‘in the public interest’, a term that is not defined.<sup>67</sup> Nor is it at all clear why tariffs need prior approval if they relate to service markets that either are or might be competitive, such as the mobile services market.

Part IX of the act deals with economic regulation and contains provisions on the promotion of competition and the suppression of anti-competitive behaviour that might otherwise be found in general economy-wide competition law. Tonga has no such general law.

Division 2 of Part IX deals with access to network facilities and services. This covers interconnection services, and the term is used occasionally as if it is part of ‘access’. Neither term is defined in the definition section of the act. The specific rights and obligations are:

- ‘(1) Subject to sub-sections (2) and (3), and such exemptions as may be determined by the Minister, a licensee (“providing licensee”) shall, if requested in writing to do so by another licensee (“requesting licensee”), give the requesting licensee access to its: –
- (a) network facilities;
  - (b) network services; or
  - (c) such other facilities or services which facilitate the provision of network services or applications services, including content applications services.
- (2) The providing licensee is not required to comply with sub-section (1) unless:
- (a) where the request is for access to: –
    - (i) network facilities, the access is for the sole purpose of enabling the requesting licensee to: –
      - (aa) provide competitive network facilities and network services; or
      - (bb) establish its own network facilities; or
    - (ii) network services, the access is for the sole purpose of enabling the requesting licensee to supply network services or applications services; and
  - (b) the requesting licensee gives the providing licensee reasonable notice that the requesting licensee requires the access.’<sup>68</sup>

The fundamental principles of non-discrimination and fairness are also covered:

- ‘(4) The access provided by the providing licensee to the requesting licensee under sub-section (1), shall be; –
- (a) of at least the same or more favourable technical standard and quality as the technical standard and quality provided in the providing licensee's network facilities or network services; and

<sup>64</sup> Section 5(a).

<sup>65</sup> Section 11.

<sup>66</sup> Section 44.

<sup>67</sup> Paragraph 45(1) (b).

<sup>68</sup> Sub-sections 93(1) and (2).

(b) on an equitable and non-discriminatory basis.<sup>69</sup>

The Department of Communication is empowered to publish guidelines relating to access and interconnection, including on technical standards, points of interconnection and charges payable.<sup>70</sup> To date it has not done so.

Section 97 empowers the department to arbitrate on terms of access where the parties have failed to agree, and at the request of one or both of the parties.

### 3.2.13.3 Regulatory framework and arrangements

The regulatory administration of interconnection and access, and of the sector generally, is with the minister and the department. There is no separate regulatory agency outside of the department.

### 3.2.13.4 Interconnection and access

The act is based on a strong preference that the service providers should arrive at a commercial agreement through negotiation on the terms and conditions for interconnection of their networks.

There is an interconnection agreement in place between TCC and Digicel. It was arrived at through negotiation between the parties and is commercially confidential, and has not been published because it is considered to be commercially confidential in its entirety.

There was not a need for the department to perform any arbitration role on matters associated with the original agreement. Subsequent to the agreement, the department has been party to a further clarification of the agreement under which both TCC and Digicel terminate incoming international calls addressed to subscribers of their respective networks. In other words, the service providers will not accept calls from each other's international gateways.<sup>71</sup>

### 3.2.13.5 Cost modelling and benchmarking

The department is working on cost models, but they were not available for use to assist in the processes leading to the current TCC – Digicel interconnection agreement.

There are no IMR specific cost models in Tonga.

### 3.2.13.6 IMR framework, legislation and arrangements

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established. However, proposed call charge rates/tariffs need to be approved by the ministry.

There are also no IMR specific orders or decisions of the minister's office in force. However, there is a general right of appeal to the ministry against orders or decisions.

For further information, see Chapter 6.

### 3.2.13.7 Resources and experience dedicated to IMR

Tonga has indicated it has allocated one staff member to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues in Tonga; but they have been used to resolve interconnect problems between the operators.

<sup>69</sup> Sub-section 93(4).

<sup>70</sup> Section 95.

<sup>71</sup> Because of the profit involved in the settlements for international calls, relative to the returns elsewhere in the market, this is a recurring issue in the Pacific and many other developing countries.

For further information, see Chapter 6.

### 3.2.14 Tuvalu

#### 3.2.14.1 Country and market background

Tuvalu comprises four reef islands and five atolls over a total land area of 26 square kilometres. It has a population of about 12,400.

Telecommunication services are provided by the Tuvalu Telecommunications Corporation (TTC), which is a monopoly service provider.

#### 3.2.14.2 Legislative framework

Service provision is governed by the Tuvalu Telecommunications Corporation Act of 1993, which established the operator in corporate form, and set out powers and duties in relation to service provision.

Section 6 of the act specifically reserves exclusive service provision rights to TTC:

‘(1) Subject to subsection (2) of section 3 of this Act,<sup>72</sup> and subsection (2) of this section the Corporation shall have the sole and exclusive right to supply telecommunication services and to establish and develop telecommunication systems in Tuvalu in accordance with its functions and powers under this Act.

‘(2) Where the Corporation is for any reasons unable to supply or provide a telecommunication service to any person in any part of Tuvalu or to establish and develop an appropriate telecommunication system for that person, it may in accordance with the regulations made by the Minister under this Act, licence a person as it may consider fit and suitable to supply or provide the service at a cost to be paid for by the person requiring the service and upon such other conditions as may be prescribed by regulations and contained in the licence.’

These statutory provisions are exceptional. They do not only reserve a monopoly to the incumbent operator, but make it clear that the only way in which a new entrant will be considered is in the situation where the incumbent is unable to provide a service. On that basis, competition is not contemplated at all, even if more than one operator is licensed.

#### 3.2.14.3 Regulatory framework and arrangements

The minister and department retain oversight of the policy and its management.

#### 3.2.14.4 Interconnection and access

There is no provision for interconnection or access arrangements, and the need is not contemplated under the act.

#### 3.2.14.5 Cost modelling and benchmarking

The results of this study lead to the conclusion that cost modeling and benchmarking have not been undertaken at present.

#### 3.2.14.6 IMR framework, legislation and arrangements

Given there is only one incumbent operator, and no IMR availability in Tuvalu, no regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established.

<sup>72</sup> These relate to military communications.

The only telecommunication legislation at present is the TTC Act 1993 and there is an assumption that IMR will fall under this act given that there is no specific legislation for IMR.

Further, Tuvalu's mobile service was rolled out in August 2004. However, it was out of service between June 2007 and November 2009 after the GSM network was damaged by lightning. As such, no consideration has yet been given to IMR.

There are also no orders or decisions by the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders are in place.

For further information, see Chapter 6.

### 3.2.14.7 Resources and experience dedicated to IMR

Tuvalu has indicated that it has not allocated a staff member to consider this issue.

There has been no call on the services of external experts for assistance on IMR issues.

For further information, see Chapter 6.

## 3.2.15 Vanuatu

### 3.2.15.1 Country and market background

Vanuatu has an aggregate land area of 12,200 square kilometres, and a population at the 2009 census of 234,023.

There are 12 licensed operators. It is intended that they be technology and service neutral. However, the provision of mobile services is restricted to two service providers, Digicel Vanuatu and Telecom Vanuatu Limited (TVL) until March 2011.

The licensees are set out in Table 3.

**Table 3: Vanuatu's licensees and services**

Company	Licence constraints	Current services	Comment
TVL	No constraints – can provide all types of telecommunication service	Fixed Mobile Internet International gateway	Internet ccTLD role to be reviewed
Digicel	No constraints – can provide all types of telecom service	Mobile Internet (via mobile phone and BlackBerry only) International gateway	Planning broadband Internet services
Interchange	Can provide all types of telecommunication service except mobile before March 2011	None	Investigating provision of a submarine cable linking Vanuatu to New Caledonia, and Vanuatu to Fiji

## Section III

Company	Licence constraints	Current services	Comment
Can'l	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	None	Planning Internet services (ISP). Its telecommunication licence is being amended to be unified and technology neutral
CNS	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	None	Planning Internet services (ISP). Its telecommunication licence is being amended to be unified and technology neutral
Hotspotzz	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	Reseller of Internet services via hot spots	Its telecommunication licence is being amended to be unified and technology neutral
Micoms	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	None	Planning Internet services (ISP). Its telecommunication license is being amended to be unified and technology neutral
Telsat	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	Broadband wireless Internet Services in Port Vila only (at this stage)	Its telecommunication license is being amended to be unified and technology neutral
Wavcom	Restricted to IP-based services No submarine cables No mobile telecommunication services before March 2011	None	Plans unclear. Its telecommunication license is being amended to be unified and technology neutral
Yumi Konek	Restricted to IP-based services, No submarine cables No mobile telecommunication services before March 2011	Providing Internet services to two remote sites using HF radio (UNDP project)	Its telecommunication licence is being amended to be unified and technology neutral

Company	Licence constraints	Current services	Comment
eTech	Restricted to IP-based services, No submarine cables No mobile telecommunication services before March 2011	None	Restriction to IP-based services and prohibition on international cables removed
Incite	Restricted to IP-based services, No submarine cables No mobile telecommunication services before March 2011	None	Restriction to IP-based services and prohibition on international cables removed

### 3.2.15.2 Legislative framework

The Telecommunications and Radio-communications Regulation Act was passed into law in 2009.

Section 4 provides for the appointment of a regulator. The regulator is intended to be an independent authority with substantial powers and functions as generally set out in section 7 of the act, and as specifically identified elsewhere in the act. Two of the general powers under section 7 are noteworthy, because of their implications for interconnection and access regulation.

(3) The regulator may, with the approval of the Minister, make such regulations as may be necessary or convenient to give effect to the provisions of this Act.

(4) Without limiting the generality of subsection (3), the regulator may make regulations:

- (a) prescribing standard terms in various licenses and exemptions; or
- (b) prescribing procedures, forms and fees in respect of any licence or exception or anything which might be done by any person under this Act, except the provision of reasons for any decision by the Regulator; or
- (c) providing for the methodology by which any calculation required to be made under this Act is to be made; or

The Regulator is responsible for issuing licences, including the determination of circumstances where licensing may not be required, and for overseeing compliance with and operation of the licence requirements and system.<sup>73</sup>

The act makes general provisions for competition,<sup>74</sup> interconnection,<sup>75</sup> and tariffs,<sup>76</sup> which, insofar as they relate to interconnection and access, are dealt with in section 3.2.15.3.

<sup>73</sup> Part 3 of the Act.

<sup>74</sup> Part 5 of the Act.

<sup>75</sup> Part 6 of the Act.

<sup>76</sup> Part 7 of the Act.



**3.2.15.3 Regulatory framework and arrangements**

The regulation-making power in relation to processes and calculation-methodologies is important for specifying the arrangements to apply to interconnection. Regulation-making powers under the act generally have yet to be employed. As a result, the regulator is administering arrangements based on the broader requirements set out in the act itself, in the licences which predate the act and in the existing Interim Interconnection Agreement between TVL and Digicel.

There is no general economy-wide competition law in Vanuatu, and the competition law arrangements applying in the telecommunication sector are set out in the act. The powers in the act permit the regulator to determine telecommunication markets for any purpose in the act, having regard to a well-established set of criteria that enable boundaries of substitutability to be tested.<sup>77</sup> The act then empowers the regulator to designate dominant service providers in a market, using either of two criteria:<sup>78</sup>

Subject to the terms of any prior licence, the regulator may designate a service provider dominant within a telecommunication market if:

- (a) the service provider's gross revenues from that telecommunications market constitutes 40 per cent or more of the total gross revenues of all service providers from that telecommunication market; or
- (a) The regulator reasonably considers that, either individually or acting in concert with others, the service provider:
  - (i) enjoys a position of economic strength or controls a bottleneck facility in the relevant telecommunications market; and
  - (ii) such strength or control affords the service provider the power to behave to an appreciable extent independently of competitors, customers, end users or potential competitors in that telecommunications market.

Behaviour that might constitute anti-competitive behaviour or abuse of dominance is set out, in specifically non-exhaustive listings, in sections 22 and 23 respectively.

Part 6 of the act sets out the procedural and other requirements for interconnection in considerable detail. The act requires that:

- defined access seekers have a right to interconnect;<sup>79</sup>
- good faith negotiations will occur after a formal request for interconnection,<sup>80</sup>
- absent an order to the contrary by the regulator, a service provider will not be required to enter into an interconnection agreement that might result in damage to its network, interference with network operations or prevent the provision of services to its end users.<sup>81</sup>

The act empowers the regulator to notify a service provider to prepare and submit a reference interconnection offer (RIO) within 90 days.<sup>82</sup> The regulator may require amended provisions compared to those suggested by the service provider to be included.<sup>83</sup> Prices in RIOs are to be in accordance with the interconnection charge standards in section 30. RIOs must also be published, including in the website of the relevant service provider.

<sup>77</sup> Section 20.

<sup>78</sup> Sub-section 20(1).

<sup>79</sup> Sub-section 26(1).

<sup>80</sup> Sub-sections 21(2 (and (3).

<sup>81</sup> Sub-section 21(4).

<sup>82</sup> Section 27.

<sup>83</sup> Sub-section 27(4).

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Section 28 provides for interconnection agreements to be published within 10 days of being entered into. The act contains provisions enabling service providers to claim confidentiality in relation to matters in an agreement. The decision on confidentiality claims lies with the regulator.

Section 29 sets out the basic requirements for interconnection, including that it should be, for example, non-discriminatory, at technically feasible points and on reasonable terms and conditions. These requirements reflect the language of section 2 of the reference paper attached to the General Agreement of Trade Services (GATS).

Section 30 on interconnection charges, sets the standard upon which interconnection charges will be based:

- (1) If there is any dispute over prices for interconnection by access providers or where the regulator is to determine these prices under section 27, the regulator must determine the prices by benchmarking against cost-oriented prices for interconnection in other jurisdictions selected by the regulator.
- (2) The regulator may use any other method of calculation or determination of the prices, but only where the regulator determines that it is unable to identify an appropriate selection of cost-oriented prices in other jurisdictions.

The regulator may arbitrate interconnection disputes.<sup>84</sup>

Non-compliant interconnection agreements are void.<sup>85</sup> This is a curious provision and also untested as yet, because it leaves open that a party might rely on its own non-compliance to avoid an agreement that it finds inconvenient or problematic.

#### 3.2.15.4 Interconnection and access

The provisions for all future arrangements governing interconnection are set out in some detail in the act. For the present, the only applicable interconnection agreement is the one that has been entered into before the act became law, between TVL and Digicel. The current agreement commenced on 25 June 2008 and has a term of four years, with only the price arrangements to be reviewed within that period. The price terms can be reviewed after 20 months (after 25 February 2010) with amendments taking effect at the two-year point (25 June 2010). The interconnection agreement was set up as part of the settlement negotiations between the government and TVL's shareholders when TVL's monopoly was terminated. The interconnection agreement is regarded as a private agreement and not published. It is, however, shared with the regulator.

In addition, one of the new entrants (Telsat), has asked TVL certain roles, responsibilities and processes to be followed spelt out in the agreement.

In addition, two of the new entrants (Telsat and Can'l) successfully negotiated and established interconnection links with each other on 20 September 2010, and Telsat successfully negotiated and established interconnection links with TVL on 11 October 2010. These are 5GHz wireless links.

#### 3.2.15.5 Cost modelling and benchmarking

The status of cost modelling and benchmarking under the act are covered in section 30; which is cited in section 3.2.15.3.

<sup>84</sup> Section 31.

<sup>85</sup> Section 32.

The act is unusual in that it nominates the benchmarking of cost-oriented prices in other selected jurisdictions as the primary method of determining interconnection charges. However, there is a clear duty on the regulator to make a selection and to be satisfied that the comparator set or cost-oriented prices for interconnection. Sub-section 30(2) permits the regulator to use other methods for determining interconnection charges, including, one assumes, cost modelling. However these alternative methods are only to be adopted if the regulator 'is unable to identify an appropriate selection of cost-oriented prices in other jurisdictions'. This pre-condition has yet to be tested. However, the challenges that attend benchmarking studies for interconnection charges would effectively leave it to the discretion of the regulator whether or not it would be a good idea to examine alternatives.

The interconnection charges in the current TVL-Digicel interconnection agreement were based on a benchmarking study undertaken by a New Zealand consulting firm. A benchmarking study was used because TVL and the government both agreed that a costing exercise was unduly arduous and costly. In addition, Digicel's network did not exist at that stage so any costing would have been theoretical and based on proxy data.

There are, however, no IMR-specific cost models in Vanuatu.

### 3.2.15.6 IMR framework, legislation and arrangements

Under Part 7 of the Telecommunications and Radiocommunications Regulation Act No. 30, 2009, Articles 33 to 38 set out the guidelines for general tariffs including tariffs approval, publication of tariffs, tariffs for services to other service providers, general principles for tariff regulations, cost studies, and price cap regulation method.

No regulatory frameworks or IMR arrangements are in place. IMR guidelines have not been established. However, there are plans to amend or introduce IMR requirements or regulatory frameworks but these, as yet, have not been defined.

The two current telecommunication service providers, Telecom Vanuatu Limited (TVL) and Digicel Vanuatu Ltd, currently make their own decisions for their IMR provision.

If IMR regulations are established, the Office of the Vanuatu Telecommunications Regulator may have some responsibility for IMR, but Vanuatu's policy relies on a competitive market, in the first instance, to produce the best outcomes for consumers. Regulation is only applied to recognized instances of market failure.

There are also no orders or decisions of the minister's office currently in force relating to IMR. As such, no provision or process for or rights of appeal against any such decisions or orders are in place. However, there is a right of appeal against the regulator's orders. Provisions for or rights of appeal against decisions or orders of the regulatory authority are set out under Part 10 (Review of Decisions of the Regulator) of the Telecommunications and Radiocommunications Regulation Act No. 30 2009.

An appeal may be made to:

1. the regulator (internal review);
2. the Supreme Court (judicial review);
3. an independent expert (external expert review).

For further information, see Chapter 6.

### **3.2.15.7 Resources and experience dedicated to IMR**

Vanuatu has indicated it has five staff members, including the telecommunication regulator, available to consider this issue.

While the IMR issue has been recognized by the regulator's office as important to the Vanuatu people, especially the business community and tourists, there has been no call on the services of external experts for assistance on IMR issues. For further information, see Chapter 6.

## 4 Information and availability of IMR in the Pacific region

### 4.1 General

One of the key aims in undertaking an IMR study and developing this report was to ascertain and document the presence or absence of IMR in the Pacific region –for both visitors and residents roaming to another country – and to identify if there may be any inhibitors to its provision.

Section 4, along with the information and tables in Chapter 6, provides this information.

This chapter draws from data received in answer to questions 12-17 of the data request form; see Annex A.

### 4.2 Absence of IMR

#### 4.2.1 General

This chapter identifies those Pacific Island countries that do not provide IMR.

#### 4.2.2 Pacific Island countries without IMR

There are five Pacific Island countries that do not provide IMR. They are:

- Kiribati'
- Marshall Islands;
- Micronesia;
- Niue;
- Tuvalu.

Currently, Micronesia only provides SMS texting to international destinations.

### 4.3 Inhibitors to IMR

The results of this assessment indicate that there are not any major inhibitors to providing IMR in the Pacific Island countries.

IMR provision seems to be directly related to:

- the state of competition in that country; that is whether or not it is in a competitive environment, or operating in a monopoly (incumbent operator), non-liberalized environment;
- government/regulatory objectives: particularly in the provision of telecommunication services in general – and then extended to IMR;
- the objectives and priorities of the operators in those countries and the current state of their service provision, particularly the penetration rate, including:
  - whether the mobile service is being rolled out or has just been rolled out;
  - whether or not those operators are facing a competitive environment.

- the opportunity for operators in those countries to derive (additional) income from IMR provision as distinct from core business;
- the number of residents (particularly driven by business residents) from that Pacific Island country travelling abroad;
- the number of visitors to the country (in particular, whether, tourism is a major driver to that nation's economy or not);
- the drive from, and awareness of, consumers and regulators (government) for establishing a competitive environment – and, then, by extension – IMR provision;
- pressures (on those countries) associated with international/regional practice, consumer awareness, and their rights to telecommunication services (including IMR provision).

Importantly, no specific Pacific Island country inhibitor to IMR was identified as a result of this study.

#### 4.4 Presence of IMR

##### 4.4.1 General

This chapter identifies those Pacific Island countries that currently have IMR and the types of IMR offered; including whether or not it is for prepaid and/or postpaid customers, and for visitors to that country and/or residents travelling overseas.

##### 4.4.2 Pacific Island countries with IMR

There are ten Pacific Island countries currently providing IMR. They are:

- Cook Islands;
- Fiji;
- Nauru;
- Palau;
- Papua New Guinea;
- Samoa;
- Solomon Islands;
- Timor-Leste;
- Tonga;
- Vanuatu.

In the Cook Islands, the current operator providing IMR is TCI.

In Fiji, the current operators offering IMR are Vodafone Fiji Ltd and Digicel Pacific Ltd.

In Nauru, Digicel offers IMR services.

In Palau, the current operators offering IMR are PNCC and PMC.

In Papua New Guinea, the current operators offering IMR are Digicel Papua New Guinea and BeMobile Ltd.

In Samoa, even though there is competition in mobile services, only Digicel offers IMR services.

In the Solomon Islands, the current operators offering IMR are STL and Bemobile Ltd.

In Timor-Leste, Timor Telecom offers IMR services.

In Tonga, both TCC and Digicel Tonga provide IMR services.

In Vanuatu, the current operators offering IMR are TVL and Digicel.

#### 4.4.3 IMR availability

Even with IMR availability in the Pacific Island countries listed, there is a differentiation in service provision between whether it is available to:

- both residents and visitors travelling overseas;
- customers that are on prepaid arrangements or those who are postpaid customers.

This is explained in the sections below.

#### 4.4.4 Prepaid and postpaid customers, residents travelling to another country and visitors

Of the Pacific Island countries that have IMR, only two have IMR available to both prepaid and postpaid customers, and to visitors roaming to that country. They are:

- Fiji;<sup>86</sup>
- Timor-Leste.

In Timor-Leste, IMR is available from the incumbent operator upon request. It may take several weeks to put the roaming arrangements in place. However, it is not available in all countries; for example, IMR is available to Timor-Leste residents travelling to the USA but not to Mexico. For postpaid customers an advance payment (deposit) must be made before roaming is available.

#### 4.4.5 Prepaid and postpaid customers

Some IMR services in Pacific Island countries are only available to postpaid customers (and for visitors to that country). Those countries are:

- Cook Islands;
- Palau;
- Papua New Guinea;
- Samoa;
- Solomon Islands.
- Tonga;
- Vanuatu.

In Papua New Guinea, Samoa and Vanuatu, there is no differentiation between visitors and residents for the provision of IMR services. IMR is available to some countries for roaming residents, but this is (usually) limited to postpaid customers.

<sup>86</sup> IMR is available to postpaid customers and also to prepaid customers; subject to the policy of the customer's service provider.

**4.4.6 Residents travelling to another country**

Some IMR services are only available to Pacific Island country residents travelling to another country and not to visitors.

**4.4.7 Visitors to Pacific Island countries**

In line with international practice, no Pacific Island country provides IMR just to visitors to that country. In all cases of IMR provision, it is available first to residents travelling abroad (and generally only to postpaid customers) and then extended to visitors – whether they are prepaid or postpaid customers in their country.

**4.5 Pacific Island operators providing IMR****4.5.1. General**

This section identifies and discusses the local Pacific operators, and their associated overseas roaming partners.

**4.5.2 Local operators**

Chapters 3 and 4 identified the operators of each of the Pacific Island countries associated with this study that are currently providing IMR.

**4.5.3 Overseas operators with roaming agreements with Pacific Island countries**

Overseas operators, associated with Pacific Island country operators providing IMR are identified below.

At the time of developing this report, information on overseas operators with roaming agreements with Pacific operators was not yet available from:

- Fiji;
- Nauru;
- Palau;
- Papua New Guinea,<sup>87</sup>
- Timor-Leste.

Information was, however, available from:

- Cook Islands;
- Papua New Guinea;
- Samoa;
- Solomon Islands;
- Tonga;
- Vanuatu.

<sup>87</sup> Papua New Guinea, information on Digicel's roaming partners.(Date Unknown)



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This is in the form of:

- bilateral roaming partners;
- inbound roaming partners;
- outbound roaming partners;
- GPRS;
- inbound roaming partners (prepaid).

In Samoa, information is available for Digicel's roaming partners.

In Vanuatu, information is available for both TVL's and Digicel's roaming partners. This information is listed in the form of:

- inbound and outbound partner (roaming abroad and roaming in Vanuatu);
- roaming abroad and roaming in Vanuatu:
  - bilateral partner;
  - inbound partner.

In the Solomon Islands, STL has roaming with:

- Australia: Telstra and Optus;
- Fiji: Vodafone;
- Papua New Guinea: Telecom;
- USA: AT&T.

The BeMobile Ltd. is also entering into roaming agreements with other countries and operators.

In Tonga, information is available for both TCC's and Digicel's roaming partners. This information is listed in the form of:

- roaming partners (for TCC and Digicel);
- inbound partners (for Digicel);
- GPRS (for Digicel);
- CAMEL (for Digicel).

## 4.6 IMR agreements

### 4.6.1 General

This section provides information on IMR agreements in the Pacific Island countries. It looks at the transparency of the agreements and the manner in which they were negotiated.

### 4.6.2 Current agreements

In all cases for the Pacific Island countries that were part of this study, IMR agreements are commercial-in-confidence. And, as such, there is not any public access to the documentation.

This means that there is no public information available to identify:

- the procedures (if any) that were followed in developing the IMR agreement;

- the length of time taken to negotiate the IMR agreement;
- any actions or issues that took up most of the time involved;
- any factors that contributed to a successful negotiation;
- any factors that contributed to a failed or extensively protracted negotiation;
- whether there is any IMR component in current interconnection agreements or access arrangements, or whether IMR agreements are separate to current interconnection agreements or access arrangements.

The response from Vanuatu seems to best sum up the Pacific region’s view:

‘Each operator has its own IMR agreements that are established on a commercial basis. These IMR agreements are private and confidential. The Office of the Vanuatu Telecommunications Regulator does not have access to these documents and believes that all information on IMR agreements is to be considered commercial-in-confidence.’

This is consistent with international practice and experience for interconnection and IMR agreements.

In Samoa, the interconnection agreement between SamoaTel and Digicel includes termination and routing services associated with IMR, and there is an obligation on dominant service providers to obtain prior approval from Office of the Regulator (OoTR) for proposed tariffs. Hence, the OoTR determined the interconnection costs.

In Niue, the normal procedure for approval of agreements is through the cabinet; but Niue does not currently have IMR available.

#### 4.6.3 How were they negotiated?

In all cases for the Pacific Island countries that were part of this study, all IMR agreements were negotiated between the respective operators. This is not surprising given their commercial-in-confidence nature and the lack of IMR regulations.

This is consistent with international practice and can also be explained through the response from Vanuatu:

‘The Regulatory Authority is not involved because there are no regulations yet.’

However, even though the agreements were negotiated under commercial-in-confidence arrangements, in some cases they required regulatory authority, department, or ministry approval. This arrangement applied in Nauru, where ministerial approval is required.

In Samoa, however, interconnection rates were not commercially agreed to and, as such, the OoTR determined the rate. For general call charge rates/tariffs, dominant service providers need to obtain approval from the OoTR and are required to publish the tariff on their website.

In Tonga, the ministry is involved to resolve any dispute between the operators. This is particularly so for interconnection disputes.

It should be noted, however, that although IMR agreements per se are negotiated between the respective operators, section 6.2 outlines the situation for interconnection disputes where arbitration by the regulator, if required, can occur.

#### 4.6.4 Information on and transparency of IMR agreements

Given the commercial-in-confidence nature of IMR agreements and the lack of IMR regulations in Pacific Island countries, there is no public access to IMR agreements. In the case of Samoa, the OoTR was aware of the interconnection cost aspects of the agreement, which included IMR interconnection and termination.

The only public information available concerns consumer information, call charging and roaming rates/tariffs.<sup>88</sup>

#### 4.6.5 IMR agreements between operators in each Pacific Island country

Two aspect of IMR in the Pacific Island countries that were to be investigated as part of this study were:

- a comparison between the agreements in each country (if possible);
- an examination of why agreements succeed or failed.

As indicated earlier in this chapter, given the commercial-in-confidence nature of IMR agreements and the lack of IMR regulations in Pacific Island countries, a comparison of the agreements and the reasons for their success or failure cannot be provided.

This information is only obtainable from the operators providing IMR and their associated overseas IMR operators.

#### 4.7 IMR costs and charges by Pacific Island country

IMR costs and charges to consumers in each Pacific Island country are discussed in section 6.7.

Section 6.8 reviews and discusses the use of IMR methodologies, cost models, benchmarking and best practices in the Pacific Island countries. In summary, none have been developed or apply.

As a general statement, IMR costs in the Pacific Island countries, like in many other parts of the world other than the EC, are not regulated and there is little involvement of the regulator or ministry in their determination by operators. Most regulatory or ministerial involvement in tariff setting relates to interconnection and, by extension, to IMR for any routing, and access or termination of calls to roaming customers. For example, see section 4.6.3 regarding Samoa.

#### 4.8 IMR consumer information provision

The provision of IMR information and its dissemination to consumers in Pacific Island countries is primarily through website access. In some cases this is the only way for consumers to gain knowledge of IMR information and charges. As such, this contributes to the lack of readily available IMR information since not all consumers have Internet access.

In most cases, the operators are required, or have been requested by the regulator, to provide access to this information.

The transparency of the information and its access relies heavily on Internet access for both residents and visitors to a country. This does mean visitors travelling to a country can become aware of (or some of) the likely costs before arriving. That too can depend on whether the visit is for business or holiday because if the visit is for business, the visitor's employer pays for the mobile roaming bill. Having said that, visitors are unaware of the 'actual' roaming cost, since that depends on the use, and the length of time of use of the handset. For example, SMS costs are likely to be known and there may be some understanding of voice call costs, but data downloads are classic cases that lead to bill shock.

<sup>88</sup> See section 4.8 of this report.

Further, the quality of the information provided is dependent on:

- a consumer's familiarity with using websites;
- their knowledge of telecommunications and the terminology used;
- the design and layout of the operator's website, (including its search-engine).

A review of the websites of the identified operators indicate that information can be obtained, however, its usefulness varies, particularly in respect of costs and charges for all services (that is voice, SMS and data). That kind of detailed information is either not available or difficult to locate.<sup>89</sup>

Importantly, all the Pacific Island countries with IMR that have taken part in this study believe that the provision of clear and accurate IMR information is an important consumer safeguard.

#### 4.9 Interconnection and access arrangements

Interconnection and access arrangements for each Pacific Island country are described in Chapter 3 and section 6.4.

#### 4.10 Current and future IMR requirements or arrangements

Of the 15 Pacific Island countries surveyed in this report only four have indicated they have planned future IMR requirements:

- Niue;
- Samoa;
- Tonga;
- Vanuatu.

Niue has indicated that it expects to have IMR requirements in place after its 2.5G GSM system is operational. Samoa and Vanuatu aim to have IMR frameworks in the near future. Tonga indicated that it has plans but it won't be soon.

Vanuatu has indicated that its plans have not yet been defined. Some, however, for example, Nauru, believe it is essential that IMR regulatory frameworks are in place in the future; and Papua New Guinea thinks there should be IMR requirements, and that this will be the subject of further consideration.

The Marshall Islands view is that IMR availability depends on whether the benefit outweighs the cost, and that its introduction would only occur as a positive outcome of a cost-benefit analysis.

#### 4.11 Potential IMR solutions and areas for improvement

Potential IMR solutions and areas for improvement are considered in more detail in Chapter 7.

Pacific Island countries' did respond to the information request with possible IMR solutions and areas for improvement.

- 'There is an urgent need to have some regulations or policies put in place to govern IMR issues. We also need to have some controlling mechanism in place on the determination of charges relating to IMR.' (Fiji)

<sup>89</sup> See also section 6.7.

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- ‘IMR should be subject to regulation because there is limited competition and a lack of regulation; operators need to publish IMR information.’ (Papua New Guinea)
- ‘All of the possible IMR solutions or areas for improvement [outlined in the information request] are relevant areas which will be of great assistance to any small island country.’ ((Nauru). Palau expressed a similar view.
- ‘Areas for urgent improvement include the need for policy, regulation, agreements, improvement on the quality of service, and solutions to fraud.’ (Fiji)
- Regarding regulatory issues affecting the provision of IMR or high IMR charges, many Pacific Island countries were of the view that these were not easily resolved given ‘IMR arrangements and charges are self-determined by the operators in the absence of regulations’.
- Many Pacific Island countries are of the view that there is an urgent need for relevant IMR policies and/or an IMR regulatory framework to be put in place.
- Regulators, government departments and ministries would assist in the formulation of the policy.
- Technical or alternative solutions could be considered including using dual SIM phones, using two phones (one for a local SIM and the other for the home SIM ), use of Skype/IP telephony.
- There are technical issues affecting IMR costs and charges, including bypassing part of the public backbone network, and fraud. (Papua New Guinea)
- The lack of IMR regulations has led to high IMR charges. (Vanuatu)
- Web-based texting could be a possible substitute for mobile roaming. (Marshall Islands)
- Cost and reliability of service is an area that regulators and operators could work together to improve the consumer experience. (Tonga)
- Retail price transparency is the first step towards avoiding bill shock. Tariff databases may prove helpful but these will be national measures (Solomon Islands).
- Inter-operator tariffs could be standardized. And measures put in place to identify fraudulent activities. (Cook Islands)



## 5 International IMR trends and current developments

### 5.1 The European Union

From 2001 onwards, the EC has repeatedly urged and encouraged mobile operators to lower the charges for customers to use a mobile phone abroad. However, they remained for many years on average four times more expensive than domestic mobile phone calls. To highlight the continuing problem, the EC launched a consumer website on roaming tariffs in October 2005. It exposed roaming prices of up to 12 Euros for a four-minute call. Even this transparency did not change the pricing behaviour of mobile operators, so it proposed to intervene by regulating. Its proposal for a regulation to lower IMR charges within the EU was published in July 2006.

Changes were driven by [Viviane Reding](#), EU Commissioner for Information Society and Media. Although strongly resisted by the operators, the regulation was approved by the [European Parliament](#). The regulation caps the rates operators can charge each other while [roaming](#) (wholesale) in the EU, and also limits the tariffs an operator can charge to customers (retail).

The regulation entered into force on 30 June 2007. From this date on, mobile operators within the EU were required to inform their customers of the new tariffs (called Eurotariff) within one month (that is by 31 July 2007), and provide an offer for switching to the new tariff. If a customer responded to this offer, the mobile phone operator had to switch them to the new tariff within one month. If they did not respond, the new tariff automatically applied from 30 September 2007, unless a special roaming package applied. The ceilings for Eurotariff gradually decrease every year. Mobile operators are able to compete below the maximum allowed level.

A Eurotariff is available in all 27 Member States of the EU and in the three European Economic Area (EEA) countries. It applies to both prepaid and postpaid customers. Switching to a Eurotariff is free of charge with no effect on existing mobile phone contracts. Also, subscribers receive an SMS when crossing the border to another EU or EEA Member State informing them of the price (including all taxes) for making and receiving calls. This message is free. It also contains phone numbers that subscribers can call to find out more detailed prices by SMS or over the phone. Calling these numbers is also free of charge.

Another decision made in October 2007 specified that this matter had relevance for the EEA Member States that are not EU members. This meant that the tariffs caps also applied to EEA Member States ([Iceland](#), [Liechtenstein](#) and [Norway](#)) as of 1 January 2008. That in turn meant that subscribers from the EU receive the benefit of the same price caps when travelling within the EEA Member States and vice versa.

Retail price caps for outgoing calls are currently 39 euro cents per minute and, for incoming calls, 15 euro cents per minute. No charge is allowed for incoming calls re-directed to voice mail. Caps were reduced on 1 July 2011 to 35 euro cents for outgoing calls and 11 euro cents for incoming calls.

Around the middle of 2008, the EC called for comments reviewing the roaming rules and their possible extension to SMS and data roaming services. Questions were raised about the general functioning of the roaming regulation as well as specific issues concerning:

- inadvertent roaming or involuntary roaming (when customers use their mobile phone close to the border of a neighboring country and are connected to a foreign network);
- the rules' effect on smaller operators and domestic prices: have the new rules led to an increase in domestic prices?
- the issue of actual versus billed call durations: has there been any change from per second to per minute billing as a result of the new rules?

- the need to extend the duration of the rules;
- the need for similar rules concerning data and SMS roaming services at wholesale and/or retail levels in light of current retail prices and market developments.

The next issue addressed was data roaming. Commissioner Viviane Reding gave operators until 1 July 2008 to consider SMS and data roaming charges. The EC then sent letters to the CEOs of all European mobile operators inquiring about their SMS and data prices. An assessment of the information showed that prices were still too high.

The EC reported back to the European Parliament and the Council at the end of 2008 with the view that there was a need to review the existing roaming rules. The EC decided to introduce maximum price limits for sending SMS messages while roaming. The European Regulators Group (ERG) suggested a level between 11 and 15 euro cents, and this was implemented in May 2009. This includes a wholesale maximum rate of 4 euro cents.

Data and internet services are not regulated at the moment by the EU at the retail level. A wholesale price cap was applied as follows:

- from 1 July 2009: a maximum of €1.00 per megabyte (excluding VAT);
- from 1 July 2010: a maximum of €0.80 per megabyte (excluding VAT);
- from 1 July 2011: a maximum of €0.50 per megabyte (excluding VAT).

Customers travelling to another EU Member State also receive an automated message of the charges that apply for data roaming services.

Under the rules introduced on 1 July 2009, customers also benefit from per-second billing after 30 seconds for calls made, and per-second billing throughout for calls received to ensure that customers do not face any hidden costs and bill shock when they are roaming. The introduction of this requirement was expected to increase customers' savings by over 20 per cent.

From 1 July 2010, operators were required to provide customers with the opportunity to determine, in advance, how much they want to spend before their roaming service is cut-off.

That regulation has been mandated until 30 June 2012 together with a continuous review of its necessities.

## 5.2 CITEI (the Southern Americas)

The 12 economies of South America have a commitment to a Regional Integration of South American Infrastructure (IIRSA). To create an environment of efficiency in the execution of projects, IIRSA's 12 member countries have agreed to adopt an Implementation Agenda Based on Consensus; this is a portfolio made up of 31 priority projects to be implemented by 2010.

The high prices for IMR have been taken up as an issue by policy-makers and regulators in South America. It has a significant and growing use of the IMR service but remains a modest source of roamers and these are mostly business travellers. Lack of use is partly due to a lack of trade integration in the region; an issue that IIRSA is trying to address. Unlike the situation in Europe, the majority of roaming in South American economies is conducted by visitors arriving from outside of the region.

The CITEI, entity of the Organization of American States, is the main telecommunication forum in the region, where governments and the private sector meet regularly to coordinate regional efforts designed to develop a global information society in line with the mandates given by the heads of state and governments in the Summit of the Americas.



To date, the focus of CITEL's activities has been on issues such as double taxation and fraud; which affect both cost and reliability. As a result of CITEL's initiatives, IIRSA has agreed to improve the transparency of roaming prices, work to reduce double taxation (that is wholesale in one country and retail in another), and solve the problem of roaming in border areas.

Chile, Mexico and Peru are members of **Asia-Pacific Economic Cooperation (APEC)** and are involved in the Asia-Pacific Economic Cooperation Telecommunications and Information (APECTEL) Working Group on IMR (see section 5.8)

### 5.3 The Gulf State Initiative (IMR in the Arab World)

The unilateral initiative taken by the Zain Group,<sup>90</sup> affects numerous Arab countries. To date, it has spread to Saudi Arabia, Lebanon, Kuwait, Egypt, Palestine, Bahrain, Jordan, Iraq and Sudan. Operators have reacted to the unilateral initiative taken by Zain to abolish IMR surcharges across its geographic footprint in North Africa, the Near East and the Persian Gulf. Where they felt disadvantaged, other operators responded with targeted offers, if necessary by entering into partnerships with rivals.

So far, this market-driven initiative has been more effective than any initiatives by governments and/or regulators.

At the inter-governmental level, the issue of international mobile roaming was raised in 2005 at the Meeting of the Arab Council of ICT Ministers, with concerns expressed by AREGNET. The council called for a study of the high level of roaming charges in the Arab League countries and for the development of appropriate solutions. It also proposed limiting the retail mark-up on wholesale charges to 15 per cent and called for full transparency for the end user of the prices being charged.

In 2006, the council resolved, in a non-binding resolution, that Arab regulators, on a national level, should put obligations on mobile operators in their respective countries to:

- lower their IMR retail tariff to a level that is appropriate and acceptable in accordance with the global norms, with a possibility of negotiating bilateral agreements between operators to lower the inter-operator tariffs;
- announce to a customer that has roamed, via an SMS message, the prices for IMR upon arrival in the visited country.

In 2008, the council considered the report on operations and tariffs, prepared by its working group, and supported the sending of an SMS to roaming customers with pricing information and approved AREGNET's proposal for a website with IMR prices.

AREGNET continued to stress the value that lower IMR rates would have in enhancing tourism and communication amongst the Arabic-speaking people. It proposed a series of price controls to create a downward glide path, which is a type of cost model. The Council of Arab Ministers of Telecommunications and Information Technology is considering price controls.

The Cooperation Council for the Arab States of the Gulf (GCC) comprises Bahrain, Oman, Saudi Arabia, Kuwait, Qatar, and the United Arab Emirates. The GCC Charter provides for the formulation of 'similar regulations' in various fields, including communications. In May 2008, the Ministerial Committee for Post, Communications and Information Technology agreed to take measures to reduce IMR charges within the GCC, based on AREGNET's proposals.

<sup>90</sup> The Zain Group is a mobile telecommunications company founded in 1983 in Kuwait as the Mobile Telecommunications Company (MTC), and later rebranded to Zain in 2007. Zain has commercial presence in eight countries across Africa and the [Middle East](#) and employs over 5000 people. On 8 June 2010, the Indian company [Bharti Airtel](#) completed a deal to buy Zain's businesses in 15 African countries for \$10.7 billion. Due to this deal Zain's Africa presence reduced from 17 countries to just two countries: [Sudan](#) and [Morocco](#).

The EU, through its European Neighbourhood and Partnership Instrument (ENPI), has sought to support and coordinate with Ministries and Regulators in the Mediterranean (a subset of the Arab League members). The ministers considered that regulatory reform should be actively pursued by the Mediterranean partners through a process of harmonization at a regional level and approximation of regulatory frameworks.

The EC has funded three successive projects on “New Approaches to Telecommunications policies” (NATP) for its Mediterranean partners. As part of NATP, the EC and ERG set out their thinking on IMR to the regulators. This apparently influenced the work of AREGNET in examining the costs of roaming and their proposed remedies.

#### 5.4 International Telecommunication Union (ITU)

The ITU Telecommunication Development Sector produced a report on IMR: *Trends in Telecommunication Reform 2008*, authored by Vaiva Lazauskaite. It was presented for discussion at ITU’s Global Symposium for Regulators (Thailand, March 2008). The report considered:

- the importance of roaming and how it works;
- cost elements and compared roaming and mobile call costs;
- regulating international mobile roaming tariffs;
- case studies: EU and outside the EU;
- self-regulation practices and market developments;
- transparency, coordination and enforcement;

The report concluded that, after analyzing IMR costs and actual prices charged, regulators might wish to choose any of the following strategies:

- no direct regulation of any IMR tariffs;
- regulating wholesale IMR rates only;
- regulating retail IMR charges only;
- regulating both wholesale and retail IMR rates.

The report led to considerable discussion of the issues at the 2008 Global Symposium for Regulators. Given the symposium’s theme, ‘Six Degrees of Sharing’, the focus of the discussion was on developing and formulating cooperative solutions.

The ITU-T Standardization Sector’s Study Group 3 (ITU-T) has a Rapporteur Group on IMR. Study Group 3 has a mandate to deal with charging issues. The Rapporteur Group circulated a questionnaire on IMR including taxation issues. There were 30 replies, including:

- large variations in the maximum and minimum rates for outgoing and incoming roamed calls;
- various tax rates, from 0 to 33 per cent; with 20 per cent being the most common rate;
- some countries levy taxes on all types of calls, others only apply them to outgoing calls;
- in some countries, the tax is a value added tax.
- no data was provided to verify a possible asymmetry in call charges arising from differences in inbound and outboard call traffic between countries.

The Rapporteur Group reported on its activities to the Study Group 3 meeting of June 2010. Since the establishment of the Rapporteur Group on IMR in January 2009, the group has collected empirical evidence from recent studies on IMR charging arrangements conducted by other organizations and researchers. It noted several common measures and features in the collected reports:

- when setting rates, operators are strongly affected by the policies of national regulatory authorities (NRAs) in regulated markets;
- national, bilateral and multilateral schemes are important;
- effects are related to the link between wholesale and retail charge and the way of thinking about 'cost-oriented'.
- customers need information, including on the limit of their mobile or package arrangement, and notice of charges before travelling.

The Rapporteur Group noted a high level of compliance in all EU Member States with the IMR services regulation at both the retail and wholesale levels. The SMS 'push' service and the facility for receiving personalized tariff information continue to perform as specified by the regulation. Further, it would appear that there is very little price differentiation now in the market and, possibly as a result, less competition as reflected in the retail prices for consumers. There is insufficient historical data to conclude whether the EC regulations have resulted in such an effect (the 'water bedding' effect) pre- and post-regulation (September 2007).

The Africa region's representatives who attended the same Rapporteur Group meeting noted the following points:

- One large operator has introduced trans-national tariffs without a roaming surcharge in order to attract and retain customers.
- Other large operator groups felt pressured by this and launched their own special low tariff for customers and/or started seamless roaming services. The terminating countries of the services are still limited.
- The African Telecommunication Union (ATU) began a project for a single African SIM card. The ATU indicated that it would develop a regulatory framework for the implementation for cross-border networks and pan-African services such as regional roaming.

The Arabic region's representatives noted:

- the region presents the conventional problems of addressing persistently high charges with retail and wholesale markets in different countries;
- AREGNET, the network of Arab telecommunication regulators, made a sequence of proposals to improve the transparency of prices and a mechanism to cap prices;
- the Arab Council of Ministers has yet to agree to implement these measures.

Representatives of the Caribbean region noted:

- regulators in Latin America are looking for their own initiative;
- offers from some operators for intra-regional roaming no longer have a punitive surcharge.

Study Group 3 has agreed to:

- continue to identify market developments that have occurred within administrations, regions and globally that have contributed to a reduction in roaming rates for consumers;
- investigate the possible effects of regulatory frameworks and agreements regarding international mobile roaming between administrations and regions, and report on this meeting of Study Group 3;
- consider the need to circulate, on an annual basis, a questionnaire to collect information on IMR issues and, in particular, inbound and outbound call rates, as well as the taxes being applied to IMR services;
- develop guidelines on best practice.

Long-time critic of IMR charges, Ewan Sutherland,<sup>91</sup> proposed that ITU could:

- adopt a recommendation on cost orientation;
- adopt guidelines on pro-competition and non-discrimination;
- develop a draft text for inclusion in the International Telecommunications Regulations.

## 5.5 The World Trade Organization (WTO)

One framework that might be used to address the trans-national element of IMR is provided by the World Trade Organization (WTO), through The General Agreement on Trade in Services (GATS) and the Telecommunications Reference scheduled as an additional commitment under Article XVIII of the GATS.

The Telecommunications Reference Paper is an additional commitment of the GATS that 88 individual economies have subscribed to. These economies represent approximately 96 per cent of world telecommunication traffic. However, none of the Pacific Island countries covered by this study have entered into WTO telecommunication commitments, including the reference paper.

The reference paper states that: ‘Appropriate measures shall be maintained for the purpose of preventing suppliers who, alone or together, are a major supplier from engaging in or continuing anti-competitive practices’, where a major supplier is defined as having ‘the ability to materially affect the terms of participation (having regard to price and supply) in the relevant market for basic telecommunication services as a result of (a) control over essential facilities; or (b) use of its position in the market.’(WTO:1998)

Further, an essential facility is defined as one that ‘is exclusively or predominantly provided by a single or limited number of suppliers’, and that ‘cannot feasibly be economically or technically substituted in order to provide a service’. It distinguishes basic from value-added telecommunications, with mobile services considered to be basic telecommunication.

Once a ‘major supplier’ has been found, the reference paper also requires that it ‘make[s] publicly available either its interconnection agreements or a reference interconnection offer’.

On the basis of the reference paper, it could be argued that competitive safeguards could be applied to IMR. Since most countries have three or four mobile networks (or one to two in the case of the Pacific Island countries), the roaming service may only be offered by a limited number of suppliers. Additionally, the visited mobile network can be thought of as not feasibly being economically or technically substituted in order to provide the (roaming) service, since there are entry barriers (for example, spectrum licences) to mobile service provision. Therefore, visited networks would match the definition of ‘essential facility’. The question here is whether multi-national operators have ‘the ability to materially affect the terms of participation (regarding price and supply) in the relevant market, as a result of the control of essential facilities, and the use of their position in the market’.

Another option would be to seek and to show that roaming agreements violate competition law. This depends on factors such as mobile market evolution, changes in regulatory frameworks and the development of traffic-steering techniques<sup>92</sup>.

The reference paper also contains some undertakings on interconnection, which apply to linking with suppliers providing telecommunication services. In the case of mobile roaming, no service substitution is adequate for providing an equivalent service because it does not provide access to the original number for the user’s home network. In other words, no service would be a roaming substitute if it does not provide incoming calls to the home network’s number. Therefore, the SIM-card (or more specifically, access to the home number) is essential to provide a substitute service.

<sup>91</sup> Ewan Sutherland, Social Science Research Network.

<sup>92</sup> Traffic steering techniques enable roaming traffic to be steered to particular foreign operators by processing the signalling received from location updates. See Telecom Austria Group (2008).

## Section V

In section 2.2 (b) of the reference paper, it is required that interconnection is provided on ‘cost-oriented rates that are transparent, reasonable [...]’. It could be argued that there are questions as to whether the rates charged at numerous points in the institutional and governance review (IGR)<sup>93</sup> chain are cost-oriented, transparent and reasonable. The US Mexico Telmex case provides valuable analysis when considering this issue.

Important provisions of the GATS relate to non-discrimination. These are referred to as the national treatment and most favoured nation provisions. However, under Article V of the GATS these provisions do not apply measures that are part of a comprehensive free-trade agreement.

The application of Article V is important to any bilateral agreement on mobile roaming charges. Provided the provisions are part of a comprehensive bilateral agreement, they would not breach the GATS.

Another option would be to use the WTO framework to request that national roaming access conditions be applied to every other country, on the basis of the MFN and national treatment obligations. That would initiate a dispute procedure that is likely to be time-consuming and politically challenging. It is doubtful whether any WTO member would be willing to engage in such a process, since outcome may take some years and be politically compromising. It is also not clear if mobile roaming services represent an important enough profit or loss for a WTO member’s operator to initiate such a dispute settlement procedure.

Finally, it should be noted that the use of WTO rules to address the issue of unreasonably high or discriminatory rates need not be effectuated simply by dispute settlement. Rather, if an awareness of the relevance of these rules develops, NRAs may be persuaded to either regulate or threaten to regulate unreasonable and discriminatory rates, without actually having to litigate, recognising that the threat of litigation is an important motivating element.

It is worth noting that the WTO framework is normally used by governments to conduct claims against other countries on behalf of their industry, that is, it is the trade barriers posed by a country to a third country’s industry that ultimately make the third country’s government initiate a dispute settlement procedure. In the roaming case, since the telecommunication sector, generally, is against further regulation of roaming services, it would be somewhat unusual if a government intervened and initiated a dispute under the GATS without the sector’s support and, indeed, against its will.

## 5.6 African region (the Zain model)<sup>94</sup>

In Africa and the nearby Middle East, an interesting commercially motivated model has emerged whereby an individual provider with transnational interests has essentially eliminated global roaming charges. The development of this model has much to do with the desire to increase market share and the lack of capacity of most subscribers to pay high roaming fees.

Celtel was a leading African mobile operator with a substantial geographical presence, often in adjoining countries. In March 2005, the Mobile Telecommunications Company (MTC) of Kuwait acquired 100 per cent of Celtel. At the end of 2006, MTC launched its new strategy: ACE. This accelerated the company’s growth in Africa, consolidated existing assets and enabled the company to expand into adjacent markets.

In September 2007, MTC adopted the use of the Zain brand. In 2006, Zain announced a one-network offer eliminating IMR surcharges for both post- and prepaid customers in three Swahili-speaking East African countries: Kenya, Tanzania and Uganda. This initiative was made possible by governments liberalizing the licensing of their international telecommunications, allowing Zain to own and interconnect gateways in the three countries. With all the traffic retained on its own network and with no roaming on the networks of rivals, there would be no out-payments – roaming had been internalized.

<sup>93</sup> See World Bank (2002).

<sup>94</sup> See Footnote 83.

The offer was gradually extended westward to the Atlantic, addressing nearly half the population of the continent including Kenya, Democratic Republic of Congo, Burkina Faso, Ghana, Tanzania, Gabon, Chad, Sierra Leone, Uganda, Malawi, Madagascar, Niger and Nigeria. In 2008 and 2009, Zain announced an extension to include Bahrain, Iraq, Jordan, Saudi Arabia and Sudan.

The offer was extended to data and Internet access in May 2009. Initially, the offer covered Kenya, Tanzania, Uganda, and some countries in the Levant.

The offer eliminates all IMR charges for both postpaid and prepaid customers – they simply pay the applicable national rates for outbound calls and receive inbound calls free of charge, as if they were at home. Prepaid customers are also able to use locally purchased top-up cards to maintain their credit balance.

Zain customers in Africa are almost exclusively prepaid. Usually in excess of 95 per cent of customers would never pay traditional IMR charges, but would instead change their SIM cards at the border. It, therefore, made commercial sense to abandon established IMR charging models in order to avoid customers switching to a rival operator. It also allowed customers access to all of their stored credit and ensured cross-border communications, keeping friends and families connected.

Zain has had a significant effect on rivals, which have felt it necessary to respond, particularly on heavily travelled routes. The large operator groups, notably MTN, a South African based multinational mobile telecommunications company, Orange and Vodafone, have all felt themselves to be under sufficient pressure from Zain to respond, at least to some extent. MTN, a rival pan-African operator, launched a special low-roaming tariff for its customers based in South Africa. In 2007, MTN Rwanda launched a seamless-roaming service with partners in East Africa with customers paying the local rates. MTN further announced that it would introduce a seamless roaming as MTN One World for all 21 operations in Africa and the Middle.

## 5.7 The Organization for Economic Co-operation and Development (OECD)

The OECD Working Party on Communication, Infrastructure and Services Policy (CISP) has undertaken considerable work on IMR. The work was suggested by Australia in December 2008 and resulted in two reports:

- DSTI/ICCP/CISP (2009)8/FINAL – International Mobile Roaming Charging in the OECD Area
- DSTI/ICCP/CISP (2009)12/FINAL – IMRS: Analysis and Policy Recommendations

The general findings were a lack of consumer information, little information on substitutes, wholesale prices that were too high, and inelastic demand.

Policies that the OECD explored to address high wholesale charges were the development of alliances/on-net offers, global mobile virtual network operators (MVNOs), use of WTO disciplines, publication of charges and wholesale price regulation. The OECD considered policies to address the consumer perspective including retail and wholesale price regulation, alternative calling procedures, temporary number portability and dual-SIM handsets.

The OECD looked at the pros and cons of publishing rates. The publication of inter-operator tariffs would bring them into the public domain. Wholesale rate publication would allow accurate cost awareness by consumers but there were concerns about commercial confidentiality and possible room for tacit collusion.

In considering possible retail or wholesale regulation, the OECD saw wholesale price regulation as being targeted at improving competition while retail price regulation is primarily for consumer protection. In considering the level of any price regulation, there is the possibility of cost-origination (bottom-up approach), or analogy with comparable services (ensures reasonable pricing-top-down approach).

If roaming prices are regulated, this could be the responsibility of national telecommunication regulatory authorities, competition authorities, and consumer protection authorities. In the view of the OECD, the rationale for regulation could be consumer protection, removing barriers to trade and travel, promoting competition, and improving an internal market (the EC example).

The OECD considered the possibility of bilateral or multilateral agreements based on reciprocity. It also considered substitutes but acknowledged the main problem with substitutes is the very significant lack of incoming calls on the customer's usual number. Nevertheless, the OECD recommended that consumer awareness of substitutes should be increased.

## 5.8 The Asia-Pacific Economic Cooperation Tel Group (APEC Tel)

APEC Tel aims to improve telecommunication and information infrastructure in the Asia-Pacific region by developing and implementing appropriate telecommunication and information policies, including relevant human resource and development cooperation strategies. IMR is a key area of focus for APEC Tel because improving connectivity and reducing the cost of doing business between APEC members makes a contribution to one of APEC's overarching objectives: the economic integration of the Asia-Pacific region.

A survey on IMR for APEC economies was developed and distributed. APEC economies were surveyed on their IMR services, that is, call charges for both voice and data roaming. They were also asked about any initiatives being undertaken to increase competition and provide consumers with information.

The survey had four key findings.

- Consumers are often unaware that they may pay to receive calls while roaming, and of the pricing structure for the service.
- Survey respondents reported a variety of delivery technologies are still used in the region, meaning that consumers need to understand whether their handset is compatible in the economy to which they will travel.
- Roaming rates vary across economies but the average charge is a staggering USD\$15 per megabyte.
- All participating economies reported that carriers publish mobile roaming information; however this information is often difficult to find and understand. Government information provided on international mobile roaming could be described, at best, as patchy.

APEC Tel members agreed that there were several means available to them to reduce unfair international mobile roaming charges, including through:

- trade agreements (bilateral or multilateral);
- trade bodies, such as the WTO;
- standards bodies, for example ITU;
- economic development bodies, including APEC.

APEC Tel agreed that APEC economies should undertake a multi-pronged approach to addressing high IMR prices. This would include the adoption of an action plan that would:

- encourage economies to collect consistent data for IMR pricing structures, and wholesale and retail costs;
- encourage regulators to raise consumer dissatisfaction with mobile carriers;
- make available easily understandable consumer information on roaming rates and pricing structures to consumers in the APEC region;

- address double taxation;
- increase roaming coverage for prepaid customers;
- support the industry in reducing roaming fraud;
- liberalize international gateways, which can be subject to a monopoly.

The only available means for APEC to implement such actions would seem to be through some kind of comprehensive training program for regulators.

Following APEC Tel agreement that consumer guidelines need to be developed, an APEC working group, led by Australia, produced a document for the consideration of the APEC TEL community: *Guidelines for the Provision of Consumer Information on International Mobile Roaming*.

### 5.9 Asia Pacific Telecommunity (APT)

In recognition of the importance of this issue and the regional impact, APT conducted a workshop on international global roaming (Australia, June 2010).

The workshop considered pricing regulation, transparency, quality of service, border roaming, bypass, tax, frequencies, and the role of APT and other organizations. The workshop concluded with views of participants including on future APT work.

Participants considered that APT-wide regulation would be difficult. However, there was a view that bilateral arrangements could be encouraged with APT providing overall guidance.

Ernie Newman, CEO of the Telecommunications Users Association of New Zealand (TUANZ), presented a paper at the meeting, stating that the evil of roaming charges is the sole agenda item. That's indicative of the alarm governments and user groups are feeling about roaming charges and bill shock as the international use of data cards proliferates. Newman also said that he had put forward some real life user experiences from New Zealand, and [covered] a wide range of ways in which governments could conceivably address the issue so as to safeguard not only their citizens when abroad, but people visiting their countries for trade and travel. He added that this is a problem that is getting worse rather than better. With voice you can speak for only so many hours a day, but with data there is almost no limit.

Ideas that participants supported included:

- developing an industry code of conduct – but with some reservations as to its effectiveness;
- measures to improve transparency;
- customer warnings including SMS when roaming commences;
- clearer roaming information (and the use of a standard template);
- centralization of IMR information, and possibly a third-party managed database (possibly APT);
- handset warnings when moving from another technology (for example, Wi-Fi to GSM);
- implementing a cost analysis;
- developing quality-of-service measures;
- operators publishing pricing and quality of service together on websites.

Carrying out a market survey was overwhelmingly supported. This should include a review across the region of:

- pricing and benchmarking;
- customer complaints;



- transparency of services/pricing;
- impact of taxation;
- competition and substitution products.

The group considered next steps for APT:

- assign a smaller working group to work on agreed initiatives;
- prepare guidelines for transparency, pricing and taxation, service availability and quality of service;
- involve other groups including ITU Study Group 3;
- consider issues such as frequency management;
- develop ideas for an industry code of conduct and government regulation;
- recommend measures to improve transparency;
- commission a market pricing study and benchmarking.

### 5.10 Pacific Islands Telecommunications Association (PITA)

PITA, like APT, has also recognized the importance of IMR and its regional impacts. A Mobile Roaming, SMS, Network Monitoring Workshop was held in Sydney, Australia, from 9-12 August 2010.

The workshop considered technical issues, including a session on setting up an IMR service, IMR pricing regulation, mobile financial services and 3G for inbound roaming. The IMR aspect of the workshop concluded with a question and answer session and the consideration of future PITA action on IMR issues in the Pacific.

### 5.11 The GSM Association (GSMA)

GSMA represents the interests of the worldwide mobile communications industry. Spanning 219 countries, GSMA unites approximately 800 of the world's mobile operators, as well as more than 200 companies in the broader mobile ecosystem including handset-makers, software companies, equipment providers, internet companies, and media and entertainment organizations.

GSMA has a focus on innovation and creating opportunities for its members, with an aim to drive the growth of the mobile communications industry.

As indicated in section 2.3, GSMA assists its members through information on IMR and broadly outlining the content of roaming agreements in standardized form for its members.

### 5.12 Australia

Many Australian businesses and consumers have complained that while roaming services and coverage have improved over time, prices have generally remained high.

The Australian Consumer and Competition Commission (or ACCC) conducted an investigation into the issue of international inter-carrier roaming in September 2005. This report concluded that prices paid by consumers for roaming services may substantially exceed the underlying cost of providing these services, but noted that the ACCC did not have the jurisdiction necessary to enforce regulation.

## Section V

Responding to the concerns of consumers and the conclusions of ACCC, in 2008, the Australian Department of Broadband, Communications and the Digital Economy (DBCDE) engaged KPMG to investigate IMR charges. KPMG's *Report of Findings on International Mobile Roaming Charges*<sup>95</sup> was released in August 2008. The report provides a clear account of how mobile roaming works and the tariffs faced by travellers to and from Australia.

KPMG concluded that:

- consumers and regulators believe that the price of IMR is excessive;
- numerous technical studies have concluded that mobile roaming retail margins are very high;
- there is a lack of consumer clarity around mobile roaming plans and prices;
- there are limited market incentives for roaming prices to decrease.

In 2008, the Australian Minister for Broadband, Communications and the Digital Economy, Senator Stephen Conroy, requested the House of Representatives Standing Committee on Communications conduct an inquiry into international mobile roaming charges.

The committee's terms of reference set out that it would report on:

- the extent to which roaming charges reflect the underlying cost of providing those services;
- the adequacy of information available on Australian mobile operators' roaming costs and revenue in both retail and wholesale markets;
- the impact of new and emerging technologies and commercial initiatives that may reduce roaming charges for users or provide a substitute for roaming services;
- the adequacy of information available to consumers concerning the charges for users of roaming services.

The Parliamentary Committee tabled its report in Parliament on 19 March 2009. The *Phoning Home* Report provides an overview of the operations of mobile roaming and describes the committee's concerns with roaming services including the costs, limited range of roaming alternatives and lack of consumer information on roaming services.

*Phoning Home* made five recommendations.

*Recommendation 1:*

- The Parliamentary Committee recognized the difficulties associated with Australia acting unilaterally to pursue reduced international mobile roaming prices. Consequently, it recommended that Australia pursue a policy of regulating the framework for the wholesale cost of roaming through bilateral and multilateral negotiations with other countries.

*Government response:*

- The government response was to provide a principle agreement that Australia should explore the options available for bilateral and/or multilateral negotiations – consistent with existing trade obligations.
- The government agreed to work towards building international consensus on the most appropriate mechanisms for reducing roaming costs for international travellers while encouraging competition in telecommunication markets.
- It was recognized that a successful outcome will likely be subject to establishing agreement to a common framework, and that negotiations on such a complex issue are likely to be protracted.

<sup>95</sup> See KPMG (2008).

*Recommendation 2:*

- The Parliamentary Committee recommended that the competition regulator, ACCC should introduce reporting requirements for international mobile roaming services on Australian providers. In particular, the committee recommended that the cost, revenue and service-usage information be provided, as this information may be useful for the consideration of regulatory responses.

*Government response:*

- The government observed that the ACCC undertook consultation on collecting cost revenue and service usage information. A decision from ACCC relating to the record-keeping rules is expected but has not yet been released. The government noted the recommendation pending ACCC's decision for new reporting requirements for IMR services.

*Recommendation 3:*

- ACMA should facilitate a meeting of the telecommunication industry standards body, Communications Alliance, to discuss the development of a minimum standard for consumer information and awareness of roaming and potential costs. The committee considered, however, that prescriptive requirements for publishing pricing information were not necessary as information on roaming was widely available.
- The government should explore opportunities to collaborate with the Australian Telecommunications Users Group's (ATUG) Roam Fair campaign.

*Government response:*

- The government supported the recommendation that the ACMA facilitate a meeting with the Communications Alliance. It also encouraged the consideration of a minimum standard for consumer information and awareness, including improving mechanisms to avoid bill shock and providing price information via SMS on arrival in an overseas destination.
- The government agreed with the second part of the recommendation that it should explore opportunities to collaborate with ATUG's Roam Fair campaign.

*Recommendation 4:*

- ACMA should develop, through the Communications Alliance, an amendment to the current industry code on mobile number portability to allow temporary mobile number portability for roaming services.
- The committee reasoned that such an amendment would allow consumers to select the roaming plan offered by an Australian provider that most suited their travel arrangements, and to have access to that provider's plan for the duration of the trip, using their normal phone number. It, therefore, believed that temporary mobile number portability might reduce the retail mark-up through enhanced competition.

*Government response:*

- The government did not accept this recommendation on the basis of significant technical barriers that would prevent its implementation.
- However, it did agree to explore the intent of the recommendation to improve competition between providers of international roaming services and to allow consumers to retain their regular mobile phone numbers while they are overseas.

*Recommendation 5:*

- When an Australian government agency provides information to the public on roaming, the alternatives to roaming should be included as part of the information. The alternatives should include international calling cards, SMS, use of local networks, email and using hotel telephones.

*Government response:*

- This recommendation was agreed to and information is now provided on alternatives to roaming on government websites.
- Relevant government departments and agencies will provide information to the public on alternatives to roaming, including VOIP. The ACMA has added the list of recommended alternatives to its fact sheet on IMR. DBCDE's website, the ACCC and the Department of Foreign Affairs and Trade also provide information on IMR.

**5.13 Australia and New Zealand**

On 26 May 2010, the Australian Minister for Broadband, Communications and the Digital Economy, Senator Stephen Conroy, together with the New Zealand Minister for Communications and Information Technology, Steven Joyce, announced the release of a joint Australia-New Zealand discussion paper *Trans-Tasman Mobile Roaming*. The [paper](#) forms part of the Australian government's response to the 2009 parliamentary inquiry into IMR as discussed in section 5.12. The Australian government was pursuing a number of initiatives in response to the report to the parliamentary enquiry, including working with the New Zealand government.

The discussion paper looked at the features, quality of service, pricing transparency and prices of IMR services between Australia and New Zealand. It also presented a range of options for remedying problems that may exist in the trans-Tasman mobile roaming market. The preliminary conclusions of the paper were that in both New Zealand and Australia:

- the features offered to roamers and the quality of service is unreasonable;
- the transparency of roaming prices appears inadequate and consumer awareness seems low;
- the roaming prices offered to customers seem relatively high.

The discussion paper sought comment on its preliminary conclusions, and the range of options identified for remedying any problems in the market, as well as the degree to which other services are suitable substitutes for mobile roaming.

ITWire, an Australian communications media analysis, news and information resource, in its submission on the discussion paper pointed out that none of the recommendations appeared to be in line with the main recommendation of the parliamentary enquiry; that the government should pursue a policy of regulating the framework for the wholesale cost of roaming.

As indicated in section 5.7, the OECD has produced two reports on the subject. The first found prices to be unreasonably high; and [the second](#) concluded that government regulation might be the only solution to the problem. ITWire states that the joint Australia-New Zealand discussion paper does not even go so far as to say outright that prices are too high. Its preliminary conclusions are that "roaming prices offered to customers seem relatively high," that "the transparency of roaming prices appears inadequate and consumer awareness seems low," and that the features offered to roamers and the quality of service are reasonable.

The paper presents ‘a range of options for remedying any problems that may exist in the trans-Tasman mobile roaming market.’ However, ‘there are none floated that would be likely to lead to a reduction in prices in the short or medium term. Many of the proposed measures are largely aimed at improving customer information, not bringing down prices per se.’ For example, the paper suggests that a website could be set up where ‘a customer is able to select all the domestic operators from his or her home country and see, on a single page, the best (lowest) rates that they each charge for trans-Tasman roaming.’

Other preliminary conclusions of the discussion paper were:

- The retail analysis undertaken by the agencies provides some evidence of market failure. In other words, the prices appear to be above, and the pricing transparency and consumer awareness below, those which might prevail in a competitive market. However, more information and further analysis is required for the agencies to conclude that this is indeed the case.
- To analyze where such a market failure may occur, the extent of any failure, whether a remedy is appropriate and how remedies may positively improve market outcomes to the long-term benefit of end users, it is first necessary to define the relevant markets and their components. Section 5 (of the Australian-New Zealand discussion paper) outlines the agencies’ preliminary conclusions as to the relevant markets and asks stakeholders to provide feedback on these.

Submissions to the Australia-New Zealand discussion paper closed on 2 July 2010. No further information is currently available.

## 5.14 Extra-territorial use of ITU-T Recommendation E.212

This is the international identification plan for public networks and subscriptions, mobile country codes and mobile network codes.

### 5.14.1 Relevance to this report

Although not specifically an IMR issue, the extra-territorial use of ITU-T Recommendation E.212 (formerly the International Identification Plan for Mobile Terminals and Mobile Users; and now the International Identification Plan for Public Networks and Subscriptions: Mobile Country Codes (MCCs) and Mobile Network Codes (MNCs)) is a related matter, has roaming implications and is one which Pacific Island countries should be aware of.

As such, information on it and international developments have been included here since it may also become an issue that Pacific Island countries need to consider closely; including as an IMR issue.

### 5.14.2 Background

Extra-territorial use of an MCC and MNC is the term used to describe the situation where an MCC and MNC assigned to an operator in one country (Country A) is used in another country (Country B) through a base station established in Country B.

Extra-territorial use of an MCC and MNC involves the use of a home network identity (HNI) extra-territorially. This enables an operator to spread the reach of their previously negotiated roaming agreements; thereby facilitating the roll out of a new network with international roaming capabilities.

Extra-territorial use of an MCC and MNC has been recognized as being disruptive by GSMA, ITU and many administrations. ITU sees it as a highly contentious issue. MCCs are assigned under E.212 and, because some mobile operators had interpreted it to mean extra-territorial use was permitted; others believed it was never envisaged when E.212 was being drafted.

It should also be noted that during debates on this issue in international fora, many operators and administrations were not really concerned with extra-territorial use of an MCC and MNC because the practice did not affect them or the markets they were operating in. They saw it as a new development that was mainly confined to small islands.<sup>96</sup>

As of 15 May 2008, E.212 defines a unique international identification plan for public fixed and mobile networks, providing users with access to public telecommunication services. The E.212 identification plan was originally developed for the use in public land mobile networks only. On 23 September 2008, Annex E was approved as an amendment (Amendment 1) to E.212. Annex E outlines the (extra-territorial) use of an MCC and an MNC in a country other than the country to which the MCC has been assigned by the ITU director of the Telecommunication Standardization Bureau (TSB).

In E.212 and through advice in TSB Circular 40,<sup>97</sup> (May 2009), the ITU-T stated: ‘Extra-territorial use does not include situations where a subscriber in one country receives service from a base station in another country nor to address roaming issues.

‘The extra-territorial use of an MCC and a MNC:

- should not negatively impact services being provided by any other operators;
- is on an exceptional basis and is subject to this annex;
- is not intended to include situations where a subscriber in one country receives service from a base station located in another country (e.g. cross-border coverage leakage), or roaming;
- must comply with all national regulations of each of the administrations.

The operator using an MCC+MNC extra-territorially must provide unique and unambiguous information to its roaming partners, in order to allow them to identify the location of their subscribers. The use of MCC+MNC extra-territorially should be communicated to the international community by those administrations which have permitted such usages.’

TSB Circular 40 also outlines the procedure to be followed for:

- implementation of an extra-territorial use of an MCC and MNC;
- voluntary return of an MNC;
- criteria for cancellation of extra-territorial use;
- cancellation procedures.

Administrations and/or national regulatory authorities in both affected countries are to be advised, by the responsible operators, of the extra-territorial use of an MCC and MNC and must approve the practice. This procedure authenticates the appropriateness of their use.

E.212 also calls for the administrations of the two concerned countries to notify the director of TSB with respect to extra-territorial use of an MCC and MNC and it includes forms for such notifications. This provides global transparency of their application in the respective countries.

GSMA has developed rules that provide guidance on extra-territorial use and, importantly, for this report, information where it may impact on inbound IMR. GSMA is of the view that it does not approve nor disapprove of extra-territorial use but it has established a methodology that can be used to facilitate roaming under such a situation.

The GSMA rules and the ITU-T ongoing work, including E.212 and work being undertaken in the Tariff Group for Latin America (TAL) Group on billing, charging and accounting issues, is substantially the same.

<sup>96</sup> This is further justification for including information on this extra-territorial use of an MCC and MNC in this report.  
<sup>97</sup> ITU (2009b).

### 5.14.3 Recent developments

As an Annex to ITU Operational Bulletin No. 958 – 15.VI.2010, TSB announced that a centralized list of MNCs for E.212 had been created within TSB.

The list of MNCs was published as an annex to that ITU Operational Bulletin. Included in the bulletin was advice of extra-territorial use of an MCC and MNC in the Pacific region.

**Table 4: Extra-territorial use of an MCC and MNC in the Pacific region**

MCC/MNC	Operator(s) name	Country B– Where the MCC/MNC is to be used extra-territorially	MSIN range to be used in Country A	MSIN range to be used in Country B
542 02	Digicel (Fiji) Limited	Nauru	00 X XXXXXX (0000000000 0099999999) (Fiji)	08 40XXXXXX (0840000000 – 0840999999) (Nauru)

This is the first such reporting to the TSB to date of extra-territorial use in the Pacific island Countries. Other reporting has included Caribbean countries, and in Europe, Monaco, San Marino, and Vatican City, the Faroe Islands and Iceland.

### 5.14.4 Issues around the extra-territorial use of ITU-T E.212 MCCs and MNCs<sup>98</sup>

E.212 was originally developed for use by national cellular radio systems known as public land mobile networks (PLMN). It is hierarchical in structure and identifies geographic areas, networks and subscriptions, and provides a formatted international mobile subscription identity (IMSI).

The use of the IMSI now, however, has been extended to fixed (which facilitates convergence), global satellite and non-terrestrial networks to provide innovative services such as nomadic service, messaging service, authentication and presence.

The IMSI was created and formatted to provide a unique international identification of mobile terminals/users and to enable those terminals/users to roam among public networks that offer public mobility services. IMSIs are independent of national numbering plans.

The IMSI enables mobile terminals/users to roam among public networks, domestically and internationally, by providing a uniform and unique home network and mobile terminal/user identification that is recognizable by all conforming public networks. When transmitted between visited and home networks, the IMSI enables the exchange of subscription and billing information for the visiting mobile stations.

The function of an MCC is to identify the domiciliary country of a mobile terminal/user. By analyzing the MCC, a visited network can determine the country from which the mobile terminal/user originated, and in which country its home network resides.

The function of an MNC is to identify the home network, within the country associated with the MCC of the visiting mobile terminal/user. The visited network uses the MCC+MNC combination to identify and query the home network of the visiting mobile terminal/user that is requesting service.

<sup>98</sup> The Office of Utilities Regulation, Jamaica, in a Notice of Proposed Rule Making on the Extra-territorial Use of ITU-T E.212 MCC and MNC Codes, June 2010, provides detailed information on these issues as well as international deliberations to date.

## Section V

There has been a gradual shift in the telecommunication industry towards pan-regional operations, both at the corporate and network levels, accompanied or facilitated by the leveraging of various system integration and harmonization capabilities to achieve process improvements and functional efficiencies.

In the mobile sector, one facet of this system and process coordination development was the controversial inter-jurisdictional harmonization of IMSI identification of mobile terminal/users through extra-territorial use of the MCC and MNC code. This was largely in the Caribbean, but the practice was predated in Europe.

The situation in the Caribbean, however, drove an international investigation into the practice and resolution of the attendant potential risks. The attendant problems, whether real or perceived, were investigated and resolved through a series of ITU-T discussions and interventions. During international deliberations, major concerns shared by government officials and regulators were:

- legality of the practice;
- alternatives to using foreign HNIs;
- lack of prior disclosure of intention to use foreign HNIs before market entry;
- revenue risks;
- implications for legal interception;
- roaming inequalities.

Operators' experiences and perspectives during the international deliberations include:

- the practice creates misleading identification of the home country of the mobile user;
- there is attendant potential for roaming billing and tax issues;
- it can create an unfair advantage in the roaming market;
- there are no valid reasons to prevent the practice;
- there were no technical issues with many operators, neither was there any possibility of exhaustion of the codes;
- all revenues could be properly identified and accounted for;
- stakeholders could be assured that they would receive their share of revenues; any roaming issue is not an anti-competitive issue, but a case of levelling the playing field because incumbent operators already have roaming agreements in place;
- there were many benefits to be realized by using a foreign HNI;
- the practice supported national interests as it promoted a competitive telecommunication sector and facilitated rapid deployment of enhanced voice and data services at affordable rates;
- the new entrants were looking to expand across markets;
- it used leverage investments in infrastructure and technology to provide the low cost, high quality services regionally.

It is clear that over time, consensus was built amongst ITU members. This led to a positive acceptance of extra-territorial use of MCCs and MNCs, with the range concerns thoroughly investigated and addressed through the agreed changes to E.212 in 2008. Importantly, the technical problem that was evidenced, initially in the case of the Cayman Islands, (when subscribers roamed overseas, and by the attendant billing anomalies) and which, potentially, could have occurred elsewhere, was satisfactorily resolved by appropriate network configuration settings. In essence, the investigations revealed that the perceived problem exposed a 'location update' mobility management issue rather than a problem caused by the extra-territorial use of MCC and MNC codes.



## 6 Country and regional assessment of IMR in the Pacific

### 6.1 General

This chapter, together with chapters 3 and 4, outlines and documents the findings of the initial individual country and regional assessment of IMR in the Pacific region.

Importantly, it should be appreciated that many of the countries in the study have not yet moved to a competitive telecommunication sector. The reasons for this vary, but common reasons seem to be:

- government policy requirements;
- whether or not the population to be served, and the current and future demand for services, warrant and are sufficient to sustain two or more operators in the market.

In a one-operator environment, there is no point in establishing interconnection frameworks and processes because there is no prospect of, or need for, interconnection at this stage.

In a similar way, and for similar reasons, demands and other factors,<sup>99</sup> some Pacific Island countries have not yet found a need to introduce IMR.

Of those that have introduced IMR, none have yet introduced any IMR frameworks, legislation or arrangements, even though they are concerned about high IMR charges.<sup>100</sup>

No Pacific Island country has introduced any specific IMR cost modeling; although some have general cost principles in place, particularly for interconnection which covers IMR routing and termination.

Most Pacific Island countries have, however, staff members available to consider this issue, but there has been no call on the services of external experts for assistance on IMR issues in any Pacific Island country.

Importantly, some Pacific Island countries (Niue, Samoa, Tonga and Vanuatu) have indicated that they have future IMR requirements planned, and many believe that it is essential that IMR regulatory frameworks are in place in the future.

### 6.2 Assessment method

All 15 Pacific Island countries in this study have been compared against the various elements that feature and contribute to IMR and its associated problems. These include:

- the 'general' legislative framework, in each country;
- interconnection framework and arrangements, in each country;
- any legislative framework for IMR, in each country;
- IMR requirements, availability and agreements;
- current IMR service costs and charging rates/tariffs;
- IMR methodologies and cost models;
- IMR benchmarking and best practice.

<sup>99</sup> See section 4.3 in particular.

<sup>100</sup> The reasons for this are discussed later in this section and in other sections of this report.

### 6.3 General legislative framework<sup>101</sup>

Table 5 sets out the legislative arrangements of the Pacific Island countries in this study. Many of the countries have sector legislation that has been adapted from Australian, New Zealand and Canadian originals from various eras. In all cases, it is clear those drafting legislation have considered the arrangements in other countries to ensure that useful ideas have been considered, and incorporated as best to suit the circumstances of that country. This is standard practice and a sensible approach. However, the sector acts are less than a decade old in only eight of the countries and, in Nauru, the legislation harks back to much earlier templates from elsewhere.

In the Marshall Islands and Niue, however, the management of the sector – effectively the sector regulation – has been left with the monopoly operator for all practical purposes. In a further six Pacific Island countries, the regulatory function has been left to a minister or ministry (or department). In these countries, there is no separate regulatory agency. In only six Pacific Island countries has a regulatory agency been established separate from both the operators in the industry and from the policy-making levels of government.

Only seven of fifteen Pacific Island countries have specific provision in their sector legislation requiring or promoting competition in the sector. Micronesia plans to introduce competition into legislated policy, and another (Kiribati) has a requirement in its act, but no actual fixed and mobile network services competition in the sector at this stage.<sup>102</sup> Of the seven Pacific Island countries with legislated provision for competition, all have legislated provision for interconnection, but none have any IMR legislative requirement.

Of the Pacific Island countries in this study only Fiji and Papua New Guinea have general economy-wide competition laws that seek to identify and proscribe anti-competitive behaviour. Many of the sector-specific acts have made up for this legislative gap by including provisions on competition generally. Samoa, Tonga and Vanuatu are cases in point.

### 6.4 Interconnection framework<sup>103</sup>

As would be expected, those countries whose legislation makes no provision for competition and does not contemplate competitive service delivery do not make any provision in their legislation for interconnection.

As shown in Table 6 it is only a sub-set comprising Fiji, Kiribati, Papua New Guinea, Samoa, the Solomon Islands, Tonga and Vanuatu that have such arrangements. They make up less than half of the Pacific Island countries associated with this study.

<sup>101</sup> Much of the material from this section is drawn from, with thanks to, Holmes (2010).

<sup>102</sup> In Kiribati's case the government has negotiated with potential new entrants but has not come to a ny agreement with any new entrants at this stage.

<sup>103</sup> As for Footnote 87.

# Section VI

Table 5: Legislative framework – general

Country	Current sector legislation (last 10 years)	Separate regulatory agency		Name of ministry	Name of regulatory or supervisory agency	Legislative provision for competition	Legislative provision for interconnection	Competition law
		From operators	From ministries					
Cook Islands	No	No (Planned)	No	PM's Department	-	No (Planned)	No (Planned)	None
Fiji	Yes	Yes	Yes	Commerce Commission (soon to be TAF)	Telecommunications Authority of Fiji (TAF)	Yes	Yes	Yes
Kiribati	Yes	Yes	Yes	Ministry of Information & Communications	Telecommunications Authority of Kiribati (TAK)	Yes	Yes	No
Marshall Islands	No	No	-	Ministry of Transport & Communications	National Telecommunications Authority	No	No	No
Micronesia	No	Yes	No	Department of Transportation	-	No	No	No
Nauru	Yes	No	No	Minister	-	No	No	No
Niue	No	No	-	Niue P & T	Niue P&T	No	No	No
Palau	No	Yes	No	Ministry of Infrastructure, Industries and Commerce	-	No	No	No
PAPUA NEW GUINEA	Yes	Yes	Yes	Ministry of Communication & High Technology	PANGTEL will be replaced by the ICCC	Yes	Yes	Yes
Samoa	Yes	Yes	Yes	Ministry of Comms & IT	Office of the Regulator	Yes	Yes	No
Solomon Islands	Yes	Yes	Yes	Ministry of Transport, Works & Communications	Telecom Commission	Yes	Yes	No
Timor-Leste	No	Yes	Yes	Transport, Comm's & Public Wk	ARCOM	No	No	No
Tonga	Yes	Yes	No	Minister and Department of Communications	-	Yes	Yes	No
Tuvalu	No	Yes	No	Minister	-	No	No	No
Vanuatu	Yes	Yes	Yes	Infrastructure and Public Utilities	Reguletablong Telekomunikesen	Yes	Yes	No

## Section VI

Table 6: Legislative framework for interconnection

Country	Negotiation processes	Arbitration by regulator, if required	Reference interconnection offers	Publication of agreements (in legislation)	Cost-oriented & benchmarks	Cost-based & cost modelling	Comments
Cook Islands	Na	N/a	N/a	N/a	N/a	N/a	N/a
Fiji	Yes	Yes	Yes	Not required	No	Cost-based	Cost formula in legislation
Kiribati	Yes	Yes	Yes	Not required	No (1)	No (1)	(1) Must be just and reasonable
Marshall Islands	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Micronesia (FSM)	N/a	N/a	Na	N/a	N/a	N/a	N/a
Nauru	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Niue	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Palau	None	N/a	N/a	N/a	N/a	N/a	N/a
PAPUA NEW GUINEA	Yes	Yes	No	Yes	No	Yes	Act specifies the costs to be considered
Samoa	Yes	Yes	No	Yes	Yes	Yes	Cost-oriented if interim order, cost-based otherwise
Solomon Islands	Yes	Yes	No	Yes	Yes	Yes	Benchmarks to be specified by Regulator, but parties may fund cost modelling studies
Timor-Leste	No	No.	No	No	No	No	Drafts exist which would meet best practice if implemented.
Tonga	Yes	Yes	No	Not stated	No (2)	No (2)	(2) Must be on an equitable and non-discriminatory basis
Tuvalu	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Vanuatu	Yes	Yes	Yes	Yes	Preferred method	Available method	Note: Benchmarking and cost-based methods only applicable if determined by regulator

Of the Pacific Island countries referred to, all have provision for negotiation by the parties and for arbitration by the regulator if the parties fail to agree and seek arbitration.

Only three Pacific Island countries, Fiji, Kiribati and Vanuatu, have provision for reference interconnection offers to be prepared by service providers (usually limited to dominant service providers) and approved by the regulator.

In only four Pacific Island countries – Papua New Guinea, Samoa, the Solomon Islands and Vanuatu – does the legislation provide for the publication of interconnection agreements.

The legislation in five Pacific Island countries specifically refers to costs in relation to interconnection charges. The variation in treatment of costs is wide.

- Fiji: the legislation specifies a cost-based approach and specifies the cost formula to be applied.
- Papua New Guinea: if there is arbitration by the regulator, the charges must be cost-based, and the legislation sets out the costs to be considered.
- Samoa: charges may be cost-oriented if they relate to charges in interim orders, but must be cost-based otherwise. ‘Cost-oriented’ is taken to include benchmarking of charges in other similar countries where the rates are based on cost studies. ‘Cost-based’ means based on a study or assessment of costs in Samoa.
- Solomon Islands: there is an assumption that benchmarking will be acceptable, but the legislation empowers the regulator to determine the benchmarks to apply. However, cost-studies may be undertaken if the parties proposing them also agree to fund them. The legislation recognizes that cost studies and cost modelling may be costly to undertake.
- Vanuatu: the legislation nominates benchmarking as a preferred method for determining comparable costs in Vanuatu, but empowers the regulator to use cost-based approaches and to develop cost models if this is thought desirable.

The first three Pacific Island countries are clearly focused on cost-based interconnection outcomes, whereas the last two nominate benchmarking (cost-oriented approaches) as preferable, but allow for cost-based approaches and cost modelling under defined circumstances.

## 6.5 IMR framework – legislative and regulatory

- As outlined in sections 4.10 and 4.11, there are currently no legislative or regulatory IMR frameworks in place in any of the 15 Pacific Island countries that were surveyed for this report. Three (Niue, Samoa and Vanuatu) have indicated that they have (near) future IMR requirements planned; but these have not yet been defined and Tonga has outlined it has long-term plans.

Two other Pacific Island countries (Nauru and Papua New Guinea) believe that IMR regulatory frameworks need to be in place in the future.

Table 7 sets out a summary and comparison of:

- IMR legislative arrangements and framework;
- administration/regulatory responsibility for IMR issues;
- other IMR issues.

It draws on data from answers to questions 4, 5, 6, 8, 10 and 11 in the data request form; see Annex A.

## 6.6 IMR requirements, availability and agreements

IMR information and the content of IMR agreements.

Table 8 attempts to summarize that material and compare the situation in each Pacific Island country against the others. It sets out a summary and comparison of:

- IMR availability;
- the types of IMR available, for example, prepaid, postpaid, to residents and/or visitors;
- information on current IMR agreements;
- provision of consumer information.

It draws on data from answers to questions 12, 14, 15 and 17 in the data request form; see Annex A.

## 6.7 Current IMR service charges and charging rates/tariffs

### 6.7.1 General

This section reviews and discusses the cost of IMR in Pacific Island countries.

Table 9 sets out a summary and comparison of:

- availability of IMR information;
- current IMR costs and charges;
- information on how IMR costs and charges are currently calculated;
- whether or not there is a difference in charges for inbound and outbound roaming, and for voice, data and SMS;

It draws on data from answers to questions 13 and 14 in the data request form; see Annex A.

An important but not unexpected finding is that it is not possible to obtain information on how Pacific Island country operators currently calculate their IMR costs and charges. The reason for this is the commercial-in-confidence nature of their interconnection agreements. This lack of transparency leads to a suspicion by consumers that the IMR charges they have to pay are not cost based, and are a revenue-raising operator mechanism.

## Section VI

**Table 7: Legislative framework for IMR**

Country	Legislative provision for IMR (Q4)	IMR regulatory framework & guidelines (Q5 & 7)	Coverage of IMR regulations (Q5)	Responsibility for IMR (Q6)	Arbitration by regulator or supervisory agency	IMR orders or decisions (Q8)	IMR appeal process against decisions or orders (Q10 & 11)
Cook Islands	No	No	No	TCI	No	No	No
Fiji	None yet	None applies	None applies	Currently the Office of the Minister, but soon TAF	No	None in place	No provision. Commerce Commission makes the decisions
Kiribati	No (no IMR)	No	N/A	N/A	No	No	No
Marshall Islands	No (no IMR)	No	N/A	N/A	No	No	No
Micronesia	No (no IMR)	No	N/A	N/A	No	No	No
Nauru	No	No	None	Not determined	No	No	No
Niue	No	No	None	Cabinet	No	No	Cabinet
Palau	No	No	No	Operators; Division of Communications for spectrum	No	No	Appeal through court system if licence denied
PAPUA NEW GUINEA	None yet	None applies	None applies	ICCC/NICT	No	No	ICCC/NICT Appeals Panel
Samoa	No	No	Dominant operators must obtain tariff approval from OoTR	OoTR	No	No	No
Solomon Islands	No	No	No	Operators and Telecommunication Commissioners if there is a problem	No	No	Right of Appeal to the High Court; & Dispute & Appeal Panel
Timor-Leste <sup>104</sup>	?	?	?	?	?	?	?
Tonga	No	No	Communications Act 2000	Operators & Ministry	Yes; for interconnect	No	Generally, to the Ministry
Tuvalu	No (no IMR)	No	N/A	TTC	No	No	No
Vanuatu	No	No	None applies	Operators	No	No	General appeal through regulator, Supreme Court independent expert

<sup>104</sup> Awaiting further information from Timor-Leste to complete this table.

Table 8: IMR requirements, availability, agreements and interconnection

Country	IMR available	If available		If available, what operators?	If available		Current IMR agreements						Future plans for IMR
		Prepaid	Postpaid		To residents	To visitors	In place	Negotiated between parties	Arbitrated, regulator assisted	Approved by regulator or supervisory agency	Commercial-in-confidence	Publicly available	
Cook Islands	Yes	No	Yes	TCI	Yes	Yes	Operator only	Yes	No	No	Yes	No	No
Fiji	Yes	Yes	Yes	Vodafone Fiji & Digicel Pacific	Yes	Yes	Operator only	Yes	No	No	Yes	No	No
Kiribati	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marshall Islands	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A <sup>105</sup>
Micronesia (FSM)	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nauru	Yes	No	Yes	Digicel	Yes	No	Operator only	Yes	No	Yes, Ministry	Yes	No	No <sup>106</sup>
Niue	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Palau	Yes	No	Yes	PNCC & PMC	Yes	Yes	Operator only	Yes	No	No	Yes	No	No
PAPUA NEW GUINEA	Yes	No	Yes	Digicel PAPUA NEW GUINEA & BeMobile	Yes	Yes	Operator only	Yes	No	No	Yes	No	No <sup>107</sup>
Samoa	Yes	No	Yes	Digicel (only)	Yes	Yes	Operator + some OoTr	Yes	No	Dominant operator needs OoTR I/C tariff approval	Yes	No	Yes
Solomon Islands	Yes	No	Yes	STL & BeMobile	Yes	Yes	Operator only	Yes	No	Yes; by TCI	Yes	No	No

<sup>105</sup> The Marshall Islands' view is that IMR availability will depend on whether the benefit outweighs the cost, and that its introduction would only occur as a positive outcome of a cost/benefit study.

<sup>106</sup> No, but Nauru thinks it is essential that IMR frameworks are in place in the future.

<sup>107</sup> No, but Papua New Guinea thinks there should be IMR requirements and this will be the subject of further consideration.



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Country	IMR available	If available		If available, what operators?	If available		Current IMR agreements						Future plans for IMR
		Prepaid	Postpaid		To residents	To visitors	In place	Negotiated between parties	Arbitrated, regulator assisted	Approved by regulator or supervisory agency	Commercial-in-confidence	Publicly available	
Timor-Leste <sup>108</sup>	Yes	Yes	Yes (but a deposit is required in advance of travel)	Timor Telecom	Yes	Yes	?	?	?	?	?	?	?
Tonga	Yes	No	Yes	TCC and Digicel	Yes	Yes	Operator only	Yes	Partly	No	Yes	No	Yes; long term
Tuvalu	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vanuatu	Yes	No	Yes	TVL & Digicel	Yes	Yes	Operator only	Yes	No	No	Yes	No	Yes

<sup>108</sup> Awaiting further information from Timor-Leste to complete this table.

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Table 9: IMR information available – current IMR/service costs and charging rates/tariffs

Country	Availability of IMR information				Availability of current IMR costs & charges				How are roaming costs & charges currently calculated?	Difference between inbound & outbound roaming?	Difference between voice, SMS & data download?
	Mandatory	Available (web or published)	Are IMR rates freely available <sup>109</sup> ?	Availability of consumer information	Can current costs/charges be identified?		IMR wholesale charging rates				
					To residents roaming	To visitors	Commercial-in-confidence?	Cost /charging breakdown available?			
Cook Islands	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	Yes	? Up to operators	Yes	Yes
Fiji	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
Kiribati	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marshall Islands	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Micronesia	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nauru	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
Niue	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Palau	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
PAPUA NEW GUINEA	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
Samoa	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
Solomon Islands	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	Yes	? Up to operators	Yes	Yes

<sup>109</sup> Some, but not all, information is freely available but the utility of it varies; particularly in respect of costs and charges for *all* services (voice, SMS and data). See section 4.8.

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Country	Availability of IMR information				Availability of current IMR costs & charges				How are roaming costs & charges currently calculated?	Difference between inbound & outbound roaming?	Difference between voice, SMS & data download?
	Mandatory	Available (web or published)	Are IMR rates freely available <sup>109</sup> ?	Availability of consumer information	Can current costs/charges be identified?		IMR wholesale charging rates				
					To residents roaming	To visitors	Commercial-in-confidence?	Cost /charging breakdown available?			
Timor-Leste <sup>110</sup>	?	?	?	?	?	?	?	?	?	?	?
Tonga	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes
Tuvalu	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vanuatu	No	Yes. On web	Yes	Yes	Yes	Yes	Yes	No	? Up to operators	Yes	Yes

<sup>110</sup> Awaiting further information from Timor-Leste to complete this table.

The Infocomm Development Authority of Singapore and the Malaysian Communication and Multimedia Commission have asked local mobile operators for feedback on a proposal to progressively reduce roaming charges. The plan seeks to cut roaming charges for voice calls by 30 per cent and lower roaming charges for SMS messages by 50 per cent.

Interestingly, the statement made no mention of plans to cut roaming charges for data access.

Located at the southern tip of the Malay Peninsula, Singapore was part of Malaysia when the former British colony became independent in 1963, but the two separated in 1965. While government relations between the two countries have had their ups and downs over the years, personal and commercial ties between people on both sides of the border remained strong. As a result, many Singaporeans and Malaysians travel frequently between the two countries and would benefit from lower roaming costs.

The joint statement said: 'With increased tourism and private and business travels between Singapore and Malaysia, and the rising penetration rate of mobile telephony in both countries, it is reasonable to expect mobile roaming traffic in both countries to grow in the future.'

However, it isn't clear when Singaporean and Malaysian users can expect to see lower roaming charges when travelling between the two countries. In this respect, the joint statement offered no timetable for when roaming charges would be cut, saying only that the Malaysian and Singaporean regulators will offer an update on their plans.

See also the joint initiative of Australia and New Zealand outlined in section 5.13 to attempt to remedy problems that exist in the trans-Tasman mobile roaming market.

## 6.8 IMR methodologies, cost models, benchmarking and best practice

### 6.8.1 General

This section reviews and discusses the use of IMR methodologies, cost models, benchmarking and best practice in the Pacific Island countries.

Table 10 sets out a summary and comparison of use of:

- IMR methodologies and IMR cost methodologies;
- benchmarking and best practice;
- other methodologies;
- IMR cost standards and cost models for IMR price setting.

It draws on data from answers to questions 21, 22, 23, 24 and 25 in the data request form; see Annex A.

No Pacific Island country has introduced any specific IMR cost modeling, although some have general cost principles in place. This is particularly so for interconnection which covers IMR routing and termination.

In respect of IMR methodologies that might be used to establish the terms and conditions for access, originating, termination, routing or interconnection of calls or data traffic that have an IMR component, including costs and charges/tariffs (wholesale and retail) and for wholesale access to facilities and services, the response from the Pacific Island countries varied from:

- none;
- not known – the majority response;
- left to each operator and, as such, was confidential and not available.

Pacific Island countries' responses to whether there are cost models that are used to determine costs and charges/tariffs (wholesale and retail) for access, originating, terminating, routing, or interconnection of calls/data traffic that have an IMR component were:

- no;
- none for IMR;
- not known;
- LRIC being used for interconnect modelling and there is an assumption that this is also applied to the IMR component.

Papua New Guinea was of the view that it needed to be cost-based and the other major Pacific Island countries said 'none' or 'not known'. In Tonga, the ministry was involved in meeting with operators on this issue.

In respect of IMR benchmarking or best practices, the Pacific Island countries responses were 'none' or 'not known'.

There are, however, best practice and regulatory benchmarking approaches from other regions/countries that could be examined for their suitability to be adopted (even in part) by Pacific Island countries. These include:

- The African region.
- The Gulf States (AREGNET).
- Latin America.

Table 10: IMR methodologies, cost models, benchmarking and best practice

Country	IMR methodology		IMR cost methodology		Benchmarking		Best practice		Any other methodology or information used to determine IMR costs, charges/tariffs?	IMR cost standard – any?	IMR cost model for price setting?
	Available?	What methodology is used?	Available?	What methodology is used?	Available?	What benchmark is used?	Available?	What best practice is used?			
Cook Islands	No	None	Via GSMA	GSMA	No	N/A	No	N/A	No	No	No
Fiji	No	None	No	None <sup>111</sup>	No	N/A	No	N/A	No	No	No
Kiribati	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marshall Islands	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Micronesia	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nauru	No	None	No	None	No	N/A	No	N/A	No	No	No
Niue	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Palau	No	None	No	None	No	N/A	No	N/A	No	No	No
PAPUA NEW GUINEA	No	None	No	None <sup>112</sup>	No	N/A	No	N/A	No	No	No
Samoa	No	None	No specific	Interconnection modelling <sup>113</sup>	No	N/A	No	N/A	See Footnote 97	No	See Footnote 97
Solomon Islands	No	None	No	None	No	N/A	No	N/A	No	No	No
Timor-Leste <sup>114</sup>	?	?	?	?	?	?	?	?	?	?	?
Tonga	No	None	No	None	No	N/A	No	N/A	No	No	No
Tuvalu	N/A (no IMR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vanuatu	No <sup>115</sup>	None	No	None	No	N/A	No	N/A	No	No	No

<sup>111</sup> Likely to be determined when TAF is established.

<sup>112</sup> None; but should be cost based.

<sup>113</sup> In Samoa the interconnection agreement between SamoaTel and Digicel includes IMR routing services. The model used is LRIC; bottom up.

<sup>114</sup> Awaiting further information from Timor-Leste to complete this table.

<sup>115</sup> This is up to the operators.

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However, as stated elsewhere in this report, all Pacific Island countries have substantial limitations in terms of resources and capacity available to regulators. Consequently, this will influence the choice of methodologies and benchmarking practice that they might choose to apply to address IMR issues. In many countries, for example, where there is a monopoly provision of fixed and mobile services, the need and opportunity to commit to best practice may not have fully arisen.

No information was made available from Pacific Island countries on awareness of any other methodologies or information that might be used for IMR regulatory cost modelling, charges/tariffs or collection of data associated with IMR in the Pacific region; other than that which is available for operators from GSMA.

This is not a surprising result given the region's current situation and developments regarding liberalization, interconnection agreements and principles, and development of regulatory frameworks per se.

Further, in some Pacific Island countries with more than one operator, regulators have not yet been established or are in the process of being established.

Chapter 7 also outlines the unique situation the Pacific Island countries face, and provides more evidence to support this result.





## 7 Observations and recommendations

### 7.1 General

This chapter provides:

- IMR observations in section 7.2;
- potential options to resolve IMR problems in section 7.3;
- recommendations in section 7.4.

The observations and recommendations for Pacific Island countries to consider are drawn from the consultant's:

- analysis of each country's responses to the data request form (particularly to questions 18, 23, 24 and 25);
- research;
- regulatory/communication experience.

It attempts to identify factors specific to the Pacific Island countries, including the gaps and potential IMR solutions, or work-arounds, that could be deployed or considered to improve the current IMR situation.

It also provides Pacific Island country, and Pacific-wide (or Asia-Pacific) regional options that could be considered.

### 7.2 Observations

#### 7.2.1 IMR charging is a global problem

- It is a complex and economic problem for regulators and administrations worldwide
- Retail costs to consumers are high
- Roaming is seen to be an operator 'profit centre' and a mechanism to raise revenue, or recover lost revenue, with tourists often being perceived as a way to 'make money'
- IMR is a problem for all countries, developed and developing, not just Pacific Island countries, with only the EC seeming to have the answers
- Bill shock is a major concern for both residents travelling overseas and visitors
- Associated with bill shock, the transparency of roaming prices appears to be inadequate and consumer awareness is low.

#### 7.2.2 Pacific Island country differences and similarities

In many respects, Pacific Island countries are similar:<sup>116</sup>

- they are isolated from the rest of the world and located relatively far from each other;
- their populations are dispersed internally, often in remote 'outer islands';
- they have limited resources;
- many societies are still bound by tribal links, and land ownership is customary.

<sup>116</sup> Polyconseil (2008).

But in other respects, they differ significantly:

- populations vary from a few thousand to several millions;
- telecommunication markets are not fully liberalized: some are monopolistic, others are competitive;
- distances from telecom peering points<sup>117</sup> vary strongly from one country to another.

What they have in common, from a telecommunication perspective, is a changing and converging communication environment, and growing demand for international connectivity in a context where demand for broadband is accelerating around the world. They also depend, to a large degree, on tourism.

### 7.2.3 Pacific Island countries' specific problems and issues

The 15 Pacific Island countries in this report cover a vast area, and have a total estimated population of less than ten million. Two-thirds of this population are residents of one Pacific Island country, Papua New Guinea. Ten of the fifteen Pacific Island countries have populations less than 200,000 and five have populations less than 25,000.

All of the Pacific Island countries are developing economies. The combination of low population and the need for development leads to challenges that are not replicated anywhere else in the world. These challenges have specific and significant implications for them and, particularly, their telecommunication sector.

In developing economies with large populations and economies of scale, extensive mobile telecommunication services have developed that are low priced and available to the majority of the population. The sector has experienced strong competition with competing suppliers able to provide low-priced services and still make a profit. The spread of mobile services in developing countries with large populations has been one of the great success stories for telecommunication and general economic development over the last decade.

In developed economies, with small population density such as Canada and Australia, there has been a commitment to cross subsidy from urban to rural consumers so that all consumers have the same access. This requires sufficient revenue generated through the urban consumers to pay for the cross subsidy.

With the possible exception of Papua New Guinea and Fiji, Pacific Island countries have the problem that they do not have the concentration of population that allows for the provision of low-cost services to low-income consumers. Incumbent carriers and new competitors do not have the market size, and the logistics of working across many isolated islands leads to very expensive infrastructure. Also, they do not have sufficient numbers of wealthy consumers to provide a cross subsidy to consumers in the most isolated areas. The small populations also mean that telecommunication regulatory authorities have very small work forces, yet these authorities have to deal with the full range of issues faced in larger jurisdictions. Competition is a difficult issue where the commercial incentives are not strong enough to supply new or competitive services, but there is growing consumer demand for wide-reaching mobile and/or broadband services.

The diseconomies of scale in Pacific Island countries inevitably lead to higher pricing and more limited provision of services. A key issue to address is what level of charge to consumers is both fair and commercially viable. This is an issue for all services including IMR. The lack of resources available to regulatory authorities makes it difficult for them to address these complex issues.

<sup>117</sup> To access the Internet, a country must be connected directly or indirectly to a telecom peering point. If a country connects to a peering point through a submarine cable, the cost is strongly influenced by the distance to cover (ITU, 2009).

In addition, there is lack of individual Pacific Island country IMR frameworks, methodologies, modelling, or benchmarking.

Further, the lack of Pacific-wide or regional IMR frameworks, methodology, models and benchmarking practices means that individual Pacific Island countries do not have these to draw on. This contributes to the difficulties in finding ways to best address IMR problems.

Given the unique situation faced by Pacific Island countries, the application of overseas modelling or benchmarking, whilst useful to consider, cannot readily be applied in the Pacific region.

The following can also be observed.

- Clear identification of the range of call component costs, particularly non-roaming in a country and outbound call costs, compared with inbound roaming and outbound roaming costs for visitors and residents roaming overseas, coupled with an explanation of why there are differences, would help consumers to understand and offset the view that they are being ‘ripped off’ through high IMR charges.
- Tourism is very important to Pacific Island country economies.
- Regulators have a critical need for assistance to deal with the key issues of price and availability.
- It is difficult for regulators and administrations of individual Pacific Island countries, including the larger ones, to initiate research or IMR studies, or develop IMR frameworks, methodologies, modelling and benchmarking given their limited resources and capacity.
- Bypass fraud is international mobile calls being routed by call resellers via an IP network using a ‘SIM box’. It is illegal in some countries and results in poor quality services for consumers, financial loss for carriers and double taxation.<sup>118</sup> Taxation in the country of call origin and in the country in which the customer is invoiced do not seem to be issues for Pacific Island countries.

#### 7.2.4 IMR charges in Pacific Island countries

Pacific Island countries have particularly difficult development challenges due to their small populations, geographical distances and isolation from other parts of the world. As such, they have diseconomies of scale and the provision of services such as telecommunication on a commercial basis is difficult.

Notwithstanding the difficulties faced, it is difficult to understand and justify the high retail costs for IMR services.

It leads to the question: can prices that are several multiples of the EC maximum be explained by diseconomies of scale? The apparent answer is not really. Further transparency from Pacific Island country operators on the derivation of their prices would assist in analyzing this situation, and would be welcome information for both regulators and customers of their services – both residents and travellers.

Roaming can be seen to be an operator ‘profit centre’ and a mechanism to raise revenue, or recover lost revenue – with tourists often being perceived as a way to make money. This, of course, has knock-on effects and can affect tourism.

While it can be seen as encouraging that operators provide (some) information on charges for voice and SMS, the level of transparency and actual expected costs for Internet data services is not good, and there is there insufficient detail.

<sup>118</sup> The ITU International Telecommunication Regulations mandate against double-taxation in principle, but there is no specific reference to IMR.

As data services become increasingly available and important, consumers and business users require this very important information to avoid bill shock.

For business travellers roaming overseas, high IMR charges add another high-cost impost that will, most likely, be passed on to residents and so increase general costs for Pacific Island country residents and their economies.

It is clear that telecommunication is very important to the economic development of Pacific Island countries. Tourism is also a very important industry, and tourists now expect to communicate home without high costs and charges. For business travellers, this is a critical need.

For tourists, business and holiday travellers, alternatives to IMR do exist but they all lack the convenience of using one's own phone and number.

To remain competitive in the international tourist marketplace, it is important for Pacific Island countries to find ways to meet the communication needs of residents and tourists at a price that they can afford.

Further work is recommended on the effect on tourist numbers of high IMR charges in Pacific Island countries. While the charges to tourists are to non-nationals of the Pacific Island countries, any negative effect of IMR charges on the tourism industry has a direct and negative effect on Pacific Island countries' economies.

A contributory factor to high retail IMR costs is the high interconnection rate that Pacific Island country operators have to pay to provide telecommunication services.

High interconnection rates contribute to high IMR rates. This is because interconnection rates are often set artificially high and interconnection agreements are based (historically) on fixed-to-fixed and mobile interconnections through a fixed network.

Interconnection charges can also be linked with licence fees, and high interconnection charges are often as a result of high license fees. Hence, lower licence fees can assist in lowering of IMR and interconnection costs and charges.

In addition, currency fluctuations impact on price setting and account settlement for the operators, which then impact on the charges to roaming customers.

However, it is worth noting the view of Ulrich Stumpf:

'There is little functional difference between a roamed and a non-roamed call and that difference tend to lie with underlying contracts and marketing and billing arrangements. If this view is accepted, it seems reasonable to expect that prices for international roaming and non-roamed calls should not have significantly large differences.

Accordingly, on its face, it appears that the retail mark-ups placed on international roaming services by mobile network operators are higher than could be expected in an effectively competitive market.<sup>119</sup>

## 7.3 Potential options to resolve IMR problems

### 7.3.1 General

This section identifies potential options to assist Pacific Island countries in their consideration and resolution of IMR issues. It provides both Pacific Island country, Asia-Pacific region and Pacific-wide options. Options to benefit tourism and other industries are also proposed.

<sup>119</sup> Stumpf (2001), p.2.

Not all will be relevant to all Pacific Island countries. That decision lies in the hands of the government, administration or regulator, and will be made based on a range of factors relevant to that country's circumstances.

There is no priority assigned to the order of the options. Recommendations are suggested in section 7.4.

### 7.3.2 Development of an Asia-Pacific framework

There is a lack of a Pacific-wide or Asia-Pacific region IMR framework, methodology, model or benchmarking practice. It would seem worthwhile to explore whether their establishment would assist Pacific Island countries to address their current IMR problems.

This could be explored and progressed through a range of fora or mechanisms including through:

- ITU, for example, via ICB4PAC or a similar project;
- APT;
- APEC-Tel;
- PITA, alone or in collaboration with other regional fora;
- A World Bank funded project.

It would seem apparent that there could be significant benefit in developing an Asia-Pacific region or a Pacific-wide initiative on IMR frameworks, methodologies, models, industry code of practice, and benchmarking practice. That approach would enable all Pacific Island countries to participate, contribute and benefit from resolutions of their specific issues, as well as Pacific-wide or Asia-Pacific regional issues, without the load being placed on an individual country. This is particularly important given the limited resources of regulators and administrations.

### 7.3.3 Pacific-wide initiative on IMR

A Pacific-wide initiative that could be considered is exploring ways to increase the transparency and broaden the awareness of consumers to IMR problems, work-arounds and, importantly, mechanisms to assist them in finding out desired IMR information and particularly costs. Mechanisms to avoid bill shock would greatly assist consumers and have a spin-off benefit of less need for regulatory or administration involvement; this is very important in the Pacific region where the challenges remain equally as large as for developed countries, the resources are low, and there is limited regulatory experience.

The use of a funding source, perhaps the EU or the World Bank, to contract a public relations/marketing expert(s) with knowledge of telecommunications – perhaps through ITU, or PITA – to develop an IMR consumer awareness toolkit that could be used and adapted by all Pacific Island countries to suit their own circumstances, could be considered.

A toolkit could also be combined with timely regulatory action to engage with, and strongly encourage, Pacific Island operators to consider and find ways to make their IMR information more transparent and readily available; and not just rely on web-based information. In this respect, hard-copy information could be available to visitors arriving and residents departing.

Improved consumer transparency could include:

- clearer roaming information through the use of a standard template, amended appropriately to suit each country;
- a 'single click' IMR information website covering all operators;

- consumer advice through an SMS with tariff information when roaming commences, and then another alert when a customer is approaching their spending/mobile package limit;
- a one-stop, centralized information base for consumers (possibly co-located with travel information websites), and possibly a third-party managed online database of additional IMR information (perhaps with ITU, PITA or APT);
- a handset warning when moving from another technology (for example, from Wi-Fi to GSM);
- capping bills, since postpaid users, in particular, are vulnerable to unexpectedly high bills for roaming (even though many operators now make a practice, both on their websites and in their retail outlets, of warning customers of the prices involved, especially for data roaming, capping bills may present a solution, implemented on either an opt-in or opt-out basis);
- enhancements to product disclosure at the time customers sign a mobile services contract, which may increase consumer awareness of the potentially high charges for using IMR services.

In addition, consideration could be given to developing a draft roaming agreement that could be a model for, and adapted by, operators in the Pacific region. That draft agreement could outline all areas that need to be considered and addressed, and could even suggest or outline IMR charge price caps. The draft agreement could be developed through regulatory action or an industry initiative. Possible mechanisms for its development could be through a source of funding or through regional fora such as ITU, PITA or APT.

#### **7.3.4 Options for action by individual Pacific Island countries**

##### **7.3.4.1 General**

A range of options that Pacific Island countries could consider to accommodate their circumstances are presented in this section.

There is no priority assigned to the order of the suggestions. Recommendations are given in section 7.4.

##### **7.3.4.2 Specific options for Pacific Island countries without IMR**

Pacific Island countries that do not currently have IMR would benefit from a study to determine why IMR has not been introduced to date, the commercial basis for introducing it, and the costs and benefits of IMR.

Funding options for this study could be considered along the lines of those proposed in section 7.3.2.

##### **7.3.4.3 Government intervention on wholesale or retail rates**

It is theoretically and practically possible for individual Pacific Island countries to intervene and impose retail or wholesale price caps on the provision of IMR services. This would generally occur when regulators believed there is market failure. However, there are a number of potential problems with market intervention, including:

- Pacific Island countries would seem to lack the resources and capacity to implement what is a complex arrangement;
- operators' commercial interest in providing IMR services in Pacific Island countries is not high and they may withdraw or lower their services if price caps are introduced;
- for countries that do not have IMR, operators might lose commercial interest in introducing it if prices are capped;
- the direct benefits of unilateral actions are mostly for non-resident visitors;

- Pacific Island countries would need to be satisfied that indirect benefits to tourism and other industries make unilateral actions worthwhile;
- a major issue for Pacific Island countries is the roll-out of mobile services, and care would need to be taken to ensure any regulatory intervention did not adversely affect the provision of new mobile services;
- direct intervention has not yet been adopted as a practice around the world with the exception of in the EU.

Before any regulatory intervention is undertaken, it is important that a full impact assessment is considered.

#### 7.3.4.4 IMR substitutes or alternatives

The use of IMR substitutes or alternatives is worth considering to overcome high roaming charges. Having said that there is no real alternative to IMR for many people.

Substitutes for international roaming services include:

- international calling cards;
- internet alternatives (such as Skype) and VOIP, since VOIP calls can be made in the following configurations:
  - computer to computer;
  - computer to public switched telephone network (PSTN) mobile or VOIP phone;
  - VOIP phone to computer;
  - IP phone to a PSTN mobile or VOIP phone.
- use of two SIM phones (including dual SIM card adapters and dual numbered SIM cards) – plastic roaming through the use of a local SIM and a visited country SIM;
- local prepaid SIM cards;
- global SIMs;
- use of data services instead of voice, for example, SMS;
- hire of a local mobile phone.

These are useful alternatives to direct roaming, and are a competitive constraint on operators providing international roaming services.

The usefulness of these is discussed below.

#### ***International calling cards***

International calling cards are prepaid or billed cards allowing customers to make international and domestic calls by dialling a cheaper local override number. Calling cards are cheaper either due to wholesale arrangements negotiated with international carriers or through their use of VOIP technology to transmit the international call via the Internet.

#### ***VOIP***

VOIP technology involves the transmission of voice data via the Internet instead of using the PSTN.

VOIP is a very useful alternative to roaming. It has had a significant impact on fixed telephony, allowing for cheaper voice calls and the provision of complementary data services. However, international experts believe that IP-based mobile telephony will only become a significant part of the overall mobile telephony market in the medium- to long-term after the mass take-up of mobile IP technology, which currently remains expensive and limited in distribution.

An example of a way to bypass roaming charges using VOIP is to use a handheld device and connect to a Wi-Fi network, then communicate using instant messaging software (such as ICQ) or VOIP (such as Skype). Some dedicated Wi-Fi phones were launched by manufacturers, but these have not been especially successful. It is even possible to use a games console such as the Sony PSP for these applications.

### ***Use of dual SIM phones***<sup>120</sup>

The use of dual SIM card adaptor mobile phones has been around for some time. A better and more practical approach now is to use a dual SIM phone.

Dual SIM card adapters can be inserted into some mobile handsets (subject to handset capability) allowing the handset to carry two SIM cards and, therefore, two phone numbers alternately.

They were one of the first means to facilitate an alternative to ‘conventional’ roaming. They were developed as a physical device to simplify switching SIM cards, which many people find awkward. An example is shown in Figure 3.

**Figure 3: Example of a dual SIM card mobile phone**<sup>121</sup>



The adaptor sits as a sheath around one SIM card in the phone with an electrical cable to a holder for a second SIM card, along with some electronics to provide the handset with a menu that allows the user to select which SIM card to use when it starts up.

The user can install SIM cards from different operators or countries, and switch manually between the two, rebooting the phone, but without having to remove the battery and change the SIM card. A trickier operation is to cut or punch two SIM cards to eliminate ‘extra’ plastic and place the two cores in a single holder in the phone; again with a choice of SIM on boot-up.

<sup>120</sup> Much of this section is drawn from Sutherland (2010b).

<sup>121</sup> Extracted from and with thanks to: Sutherland (2010b).



## Section VII

To switch between the two SIM numbers, in most cases, the mobile handset must be switched off and restarted (that is, rebooted).

A dual SIM mobile phone is one that holds two SIM cards, both of which may be active at the same time.

Dual-SIM operation allows the use of two services without the need to carry two phones at the same time. For example, the same handset can be used for business and private use with separate numbers and bills; or for travel, with an additional SIM for the country visited.

Using multiple SIM cards allows the user to take advantage of different pricing plans for calls and text messages to certain destinations as well as mobile data usage.

GSM handsets holding two SIM cards were first made by some smaller manufacturers in China, although the volume of sales is still unknown. The larger manufacturers were held back by the lack of interest from the mobile network operators, their primary distribution channel in many countries, although they have now entered the market in developing countries; including Nokia dual SIM card phones in Thailand in August 2010.

**Figure 4: example of dual sim card mobile phones**



An example application of a dual SIM phone would be for a Fijian living in Australia making a return visit; using one slot for a Fijian SIM and one for an Australian SIM.

The first major manufacturer was Samsung, which released the D880 DuoS in November 2007. This had two slots for SIM cards that could be switched without rebooting. The Smart International Group in China launched the first triple SIM handset in 2010, and there is an Indian manufactured rival, the OliveWiz GC800-V, which can take two GSM SIM cards and one CDMA removable user identity module (RUIM). Then, in June 2010, Nokia launched its C1 series of dual SIM handsets, which allow hot switching between SIM cards.

Since data traffic does not require mobile data to be associated with the home telephone number, the use of a different SIM card for data services is more convenient than for voice. On a dual SIM device, the home SIM could be used for voice and SMS roaming, while the second could be local and used for data. For a USB modem or dongle, a local SIM card should be significantly cheaper than roaming.

Dual SIM handsets are useful for international roamers who travel predominantly between two countries as they can switch SIM cards in either country, effectively retaining a local phone number in each country. However, a reason why dual SIM card devices are not widespread is that mobile carriers are reluctant to potentially share their customers with competitors.<sup>122</sup> Giving customers the possibility to easily use two SIM cards, opens the opportunity for them to have cards from different carriers in their home market.

#### ***Local prepaid SIM cards***

Local prepaid SIM cards can be purchased for use in handsets in the country in which they intend to roam. However, it should be noted that some operators 'lock' a customer's mobile phone to their network making it impossible for them to change SIM cards while travelling abroad.

However, this arrangement (along with hired mobile phones) lacks the convenience of the subscriber being contactable on the same mobile phone number regardless of which country the subscriber is in.

#### ***Global SIMs***

Global SIMs are prepaid SIM cards specifically designed for international mobile roaming users. They provide customers with cheaper outbound (and often free inbound) calls through an automated call back process.<sup>123</sup>

Users of Global SIM cards are provided with a telephone number, often originating from the Isle of Man or Lithuania. Users set their original mobile number to forward automatically to their Global SIM number and receive calls on their Global SIM, in the process being charged local rates rather than international roaming rates.

Global SIMs are not readily available in many countries, however, and require the allocation of a local country number for the cheapest IMR rate. If that local number is not available, all calls to a Global SIM in that country would be charged at international rates. However, using a Global SIM from an overseas country to another country may still be less expensive than roaming given the cheaper rates applied to non-roamed international calls.

#### ***The use of data services instead of voice call services, for example, SMS***

The use of SMS rather than voice call services is one of a variety of services available to subscribers who choose to use the international roaming services offered by mobile network operators.

In this way, a subscriber can potentially minimize the costs of international roaming services, rather than this use being a substitute for international roaming services. It is clear that an SMS does not provide the same basic characteristics or convenience of a mobile voice call. This is because SMS messaging is a truncated form of communication that does not allow end-users to communicate simultaneously.

#### ***Hire of a local mobile phone***

A customer can hire a mobile phone handset and service for use within a visited jurisdiction from a provider in an overseas country. This eliminates the need to use IMR but requires the user to advise their contacts of the phone's number before inbound calls (to that phone's number) can be made, which can be inconvenient.

The availability of mobile hire services is common in many countries.

<sup>122</sup> GlobalSIM (2008).

<sup>123</sup> GlobalSIM (2008).

***In summary***

There would seem to be some benefits to Pacific Island countries encouraging service industries, such as airports, travel agencies and accommodation providers, to make 2 SIM card phones available to visitors. This could be provided to visitors as a service but on a commercial basis. Operators or vendors could make available low-cost rental dual SIM card phones, with a local SIM already inserted.

**7.3.4.5 Adoption of rerouting technologies**

Rerouting technologies for outgoing voice calls have the potential to reduce the number of services provided and/or arranged by the visited network (from origination and termination to just origination). Hence, the wholesale charge payable from the home network to the visited network can be reduced and the subsequent savings could be passed on to consumers.

Instead of the visited network taking total care of an outgoing call, it is rerouted (or ‘hubbed’) through the home network.

If that home network is able to arrange termination services at a cost that is cheaper than what the visited network would charge, there is a potential for retail prices to be reduced.

This is a plausible assumption if the large majority of roaming calls are made back to the home country. The home network would, therefore, only have to pay a national termination rate (if the call went to a customer on a competitor’s network in the home country), or incur an on-net cost (if the call went to a customer on the home network itself).

Likewise, it is possible to use rerouting technologies to avoid the two-way trip across to the visited network and back to the home network, which occurs when a caller leaves a message on a roamer’s voicemail. The home network could, instead, deposit the message directly into the roamer’s voicemail system when the technology recognizes that the roamer’s handset is unavailable.

The ability of Pacific Island countries’ mobile networks to adopt rerouting technologies for this purpose has not been investigated or ascertained.

**7.3.4.6 Mobile WiMAX**

Mobile WiMAX is an emerging telecommunication technology that allows wireless transmission of data at broadband speed to mobile devices. Roamers could use this technology, when available, as a substitute for IMR.

However, current studies indicate uncertainty as to what extent Mobile WiMAX operators are able to create sustainable competition in the IMR market. For example, if WiMAX operators are able, for technological reasons, at the wholesale level to conclude roaming agreements only with other WiMAX operators, then the impact of the arrival of WiMAX roaming will be limited.

Its use, therefore, is directly dependent on how many Pacific Island countries consider the use of this technology.

**7.3.4.7 Network solutions**

In his paper on IMR in Asia and the Pacific, Ewan Sutherland says:

‘Efforts to bypass roaming surcharges using intelligent networks date back a decade, being an obvious approach to price arbitrage on the very large margins in roaming. However, it has faced a lack of interest and, perhaps, active resistance from mobile network operators. One of the more obvious reasons for the persistence of high prices has been the almost uniform exclusion from the market of potentially disruptive third party players.’<sup>124</sup>

<sup>124</sup> Sutherland (2010b).

He outlined recent developments in alternatives to IMR through network solutions.

- Since March 2009, NTT Docomo has offered its customers in Japan the facility of an additional number for South Korea (NTT, 2010).<sup>125</sup> The service costs ¥1,000 to set up, then ¥300 per month with the price of a local call in Korea falling from ¥50 per minute to ¥20 and of a call back to Japan from ¥125 per minute to ¥60, against its conventional 'World Wing' roaming tariff. While in Korea calls can be received directly on the Korean number or forwarded from the Japanese number, while in Japan the calls from South Korea are forwarded for ¥60 per minute.
- In January 2008, SingTel launched 'Travel SIM' which allows a customer to have a local number in Thailand on their SingTel SIM card;<sup>126</sup> it later added Hong Kong SAR. The charges are a setup fee of SGD 10.70 and the same again per country per month. Although it has indicated it would expand the service, it remains limited to just two destinations.
- Roamware, a solutions provider, offers a Prepaid Local Number (PLN) facility for operators. This enables visitors, such as prepaid customers who might not have access to roaming, to sign up to a local network directly from their handset and have a local prepaid number assigned directly to their SIM card. Thereafter they can receive calls and, with the purchase of local stored credit, send SMSs and make calls. A similar option is available from one of its rivals Starhome.
- Since 2007, Etisalat in the UAE has offered a PLN service for visitors known as Ahlan. Saudi Telecom offers a similar service. A PLN service was formerly offered in Indonesia. PLN appears to have faced resistance from the home operators who want their customers to use their roaming service, including prepaid roaming, plus competition from the sale of prepaid SIM cards by retailers over the counter and over the Internet, with postal delivery. However, the apparent failure may be due to practices devised and adopted by the operators with the GSM Association, which discourage or even forbid such offers.<sup>127</sup>

Pacific Island countries will need to consider whether any of the IMR network solutions here would be useful or viable for adoption in the Pacific region.

#### 7.3.4.8 Development of alliances or groups

Currently there are operators in the Pacific Island countries that have international mobile roaming agreements with in more than one country that belong to one group for instance, the Vodafone Passport group in Europe, or the Zain group in Africa which enable customers to take their domestic price plan abroad for a small connection fee per call. Given this, it is possible that, if more groups or alliances developed between Pacific Island countries' operators, this could have the effect of remedying any market failure.

Such an effect is possible because two operators from the same group may agree to charge each other wholesale prices very close to cost (or even zero), while two operators from the same alliance may grant discounts on wholesale prices that are over and above those granted on the basis of traffic volumes.

<sup>125</sup> At the time of the launch, NTT Docomo held 11% of the stock of KT Freetel, which it later exchanged for stock in and bonds issued by KT, when the latter acquired control of KTF.

<sup>126</sup> SingTel acquired control of AIS in Thailand through its parent Temasek Holdings.

<sup>127</sup> Sutherland. E. (2010b). The prohibition is apparently contained in GSMA (2010a).

It is in this context that attractive retail offers can become possible, such as the Vodafone Passport offer available to EU customers and the pricing of IMR charges at domestic levels available to Zain Group customers in Africa and the Middle East.<sup>128</sup> However, even if a new group or alliance emerges, there is no certainty that it would launch a low-price offer or, even if it did launch a low-price offer, that others would respond. Worldwide examples have tended to elicit few competitive responses (possibly because many consumers' sensitivity to roaming prices is quite low).

As outlined in section 6.7.3, the Infocomm Development Authority of Singapore and the Malaysian Communication and Multimedia Commission are considering progressively reducing roaming charges for voice calls by 30 per cent and lowering roaming charges for SMS messages by 50 per cent under this approach.

There is a potential in Pacific Island countries to take up this approach.

#### 7.3.4.9 Potential best practice for regulators

Potential IMR best practice for regulators could include:

- providing consumer information such as:
  - roaming prices in general;
  - warnings on the problems with and dangers of bill shock;
  - IMR alternatives or work-arounds that might be a cheaper option.
- requiring operators to publish all IMR prices for all services;
- collecting data on market trends, such as:
  - prices;
  - any new schemes;
  - traffic volumes.
- requiring roaming prices to be published on a website so that they accessible before and whilst travelling;
- requiring IMR prices to be provided when contracts are signed or an IMR service is requested;
- requiring an SMS, with pricing information, to be sent from the home country operator to customers before roaming commences;
- ensuring pricing information is clear and intelligible;
- considering that systems to avoid bill shock be a required feature of any IMR provision (for example, warning SMSs);
- developing an industry code of practice setting out the information to be provided to consumers about IMR, and this could be at a regional level.

#### 7.3.4.10 Assistance with capacity building

IMR is a complex issue which to date has proven difficult for regulators to deal with worldwide. With limited financial and human resources, this is particularly the case in Pacific Island countries.

It is recommended that international donors and funding agencies provide assistance to Pacific Island countries to develop much needed capacity to deal with this issue.

<sup>128</sup> By contrast, it could also be argued that groups and, especially, alliances might actually inhibit competitive pressures. For example, an operator of a group may not switch to an operator not of that group as its preferred visited network, even if that operator offered a much better price than an operator from the same group.

**7.3.4.11 Cooperation between Pacific Island countries**

Pacific Island countries recognize that they need to cooperate with each other to develop a common position to deal with IMR.

It is recommended that telecommunication regulators continue to cooperate through PITA, APT, ITU and other appropriate international and regional organizations.

**7.3.4.12 Development of cost models**

There are currently no cost models for IMR in the Pacific Island countries to consider and apply. The cost models developed by EC regulators for assessing price controls are a useful starting point. However, cost models need to take into account the diseconomies of scale of the Pacific Island countries.

An LRIC approach, which includes a reasonable profit, would seem to be the most appropriate. This would clearly identify the range of each specific call component cost; particularly non-roaming in-country and outbound call costs, inbound roaming cost and outbound roaming cost/charge for visitor and customer roamed to another country.

It is recommended that cost models for IMR be developed; possibly with assistance from donors.

**7.3.4.13 Analysis of the effect on tourism and other industries**

High costs and a lack of IMR availability can have a negative impact on tourism and other key industries in Pacific Island countries.

It is recommended that a study be undertaken to identify and quantify the costs and benefits of lower IMR costs and a better quality of service.

**7.3.4.14 Advice to visitors**

Tourists and business visitors would benefit from transparent, accurate and relevant information on IMR charges in each Pacific Island country, including the alternatives to IMR and their associated costs.

For IMR this would include information on charges for making and receiving calls, SMS and data access. For IMR alternatives, this would include the availability and costs for the use of dual SIM card phones, Skype and other internet access.

It is recommended that Pacific Island countries consider providing this information to tourists on arrival.

**7.3.4.15 Cooperation with regional regulators**

Although of worldwide interest, IMR charges are of specific interest to regulators in Asia, Australia and New Zealand. It is recommended that Pacific Island countries' regulators liaise with counterparts in nearby economies. This could be both independent of and through international organizations such as ITU, PITA and APT.

**7.3.4.16 Trade agreements**

The Pacific Island countries have ongoing negotiations on trade issues with the EC through an EPA and with Australia and New Zealand through the PACER Plus negotiations.

These negotiations provide the opportunity to negotiate bilateral or multilateral arrangements on telecommunications issues including IMR. It is recommended that Pacific Island countries seek to have IMR considered as part of the EPA and PACER Plus trade negotiations.

### 7.3.4.17 Option to benefit tourism and other industries

Telecommunication services are recognized as a key to economic development in other areas. Business and tourism providers, and consumers, now consider voice and Internet connectivity to be essential to their business or travel arrangements. Pacific Island countries suffer a comparative disadvantage if these services are not available at world-class standards and costs.

Tourism is a key industry for Pacific Island countries but tourists now expect to be able to use mobile phones for voice and data contact. Lack of availability is highly likely to lead to tourists choosing alternative destinations for their holidays, and business travellers for holding conferences and conducting their business.

While beyond the scope of this current study, an option Pacific Island countries could consider to assist IMR studies in the region,<sup>129</sup> would be to conduct a cost-benefit analysis of the economic benefits of lower roaming charges to the tourism and other industries.

## 7.3.5 Option beyond the mandate of this report

### 7.3.5.1 Consider if Pacific Island countries are getting a fair share of the IMR revenue

Moving beyond the mandate of this report, two significant and related issues emerge for Pacific Island countries:

- Are they getting a fair share of the IMR revenue?
- If not, what can be done to make sure they receive a fair share?

To determine what might be a fair share of IMR revenue for the Pacific Island countries, a further study would need to be conducted. That study, importantly, would need to be able to access commercial-in-confidence information to identify the cost components, and so determine what might be a fair wholesale and retail price. Some guidance on the issue of fairness is provided in the Australian Parliament's House of Representative's Standing Committee on Communications *Phoning Home: Inquiry into International Mobile Roaming*.

Although the inquiry dealt with the specifics of mobile roaming in Australia, some of the information is relevant to Pacific Island countries.

It cited two studies of the Australian market: ACCC's *Mobile Services Review: International Inter Carrier Roaming* and DBCDE's *Report of Findings on International Roaming Charges* prepared by KPMG. The ACCC report identified a retail mark-up of 25 per cent.<sup>130</sup> The KPMG report looked at pricing using a different approach and identified 83 per cent of the final retail price as mark-up and 17 per cent as actual cost.<sup>131</sup>

Care needs to be taken, however, when drawing conclusions from figures developed using different methodologies. It is possible to draw a conclusion that the majority of profit is taken at the wholesale level. The figures suggest a wholesale price that is approximately 25 per cent costs and 75 per cent mark-up.

The Australian inquiry identified Australia as a small market and suggested that small markets are at a disadvantage as price takers.<sup>132</sup>

<sup>129</sup> A collective rather than individual Pacific Island country study is recommended.

<sup>130</sup> See Australian Parliament (2009), 3.21.

<sup>131</sup> See Australian Parliament (2009), 3.34.

<sup>132</sup> See Australian Parliament (2009), 3.24.

If the size of the market is a problem for Australia, then it certainly is much more so for Pacific Island countries. What this means in practice is that the high mark-ups and resultant profits are unlikely to go to the Pacific Island countries' operators. It is likely they and the Pacific Island country economies derive very little revenue and financial benefit from IMR. This is despite the high charges to visitors to Pacific Island countries and to Pacific Island country residents travelling to other countries.

### **7.3.5.2 Conduct a further study to assist Pacific Island countries to ascertain if they are getting a fair share of the IMR revenue**

It is recommended that consideration be given to conducting a further study to identify:

- possible appropriate retail charges for IMR in the Pacific Island countries;
- possible appropriate share of revenue that should accrue to Pacific Island countries' operators.

## **7.4 Recommendations**

### **7.4.1 General**

This section identifies recommendations to assist Pacific Island countries in their consideration and resolution of IMR issues. It provides Pacific Island country, Asia-Pacific region and Pacific-wide regional options.

### **7.4.2 Recommendations for Pacific Island country consideration**

It is noted that the Pacific Island countries in this study:

- are not all liberalized and have different telecommunication markets (some are monopolistic and others competitive);
- have varying potential for development of their telecommunication sectors through competition;
- have varying potential for the provision of IMR.

The recommendations focus on those that currently have IMR. However, one specifically applies to those that do not have IMR available, and many of the recommendations for those with IMR can also be considered.

It is recommended that Pacific Island countries review and consider appropriately the following recommendations outlined in sections 7.4.3 and 7.4.4.

### **7.4.3 Recommendations for Pacific Island countries with IMR**

#### ***Recommendation 1***

It is recommended that Pacific Island countries generally consider the following potential options outlined and discussed in section 7.3:

- the development of an Asia-Pacific framework (section 7.3.2);
- the Pacific-wide initiative on IMR (section 7.3.3);
- whether or not the adoption of rerouting technologies (section 7.3.4.5) would be viable in the Pacific region;
- the application of Mobile WiMAX options (section 7.3.4.6);



- whether or not the adoption of network solutions (section 7.3.4.7) would be viable in the Pacific region;
- the development of alliances or groups (section 7.3.4.8);
- the option to benefit tourism and other industries (section 7.3.4.17).

#### **Recommendation 2**

It is recommended that Pacific Island countries consider taking action on the following potential options outlined and discussed in section 7.3:

- potential best practice for regulators (section 7.3.4.9);
- assistance with capacity building (section 7.3.4.10);
- cooperation between Pacific Island countries (section 7.3.4.11);
- the development of cost models (section 7.3.4.12);
- analyze the effect on tourism and other industries (section 7.3.4.13);
- provide advice to visitors (section 7.3.4.14);
- cooperation with regional regulators (section 7.3.4.15);
- trade agreements (section 7.3.4.16).

#### **7.4.4 Recommendations for Pacific Island countries without IMR**

##### **Recommendation 3**

The specific option outlined and discussed in section 7.3.4.2 for Pacific Island countries without IMR – to conduct a study to determine why IMR has not been introduced to date, the commercial basis for introducing it, and the costs and benefits of IMR – is recommended for consideration.

It is also recommended that Pacific Island countries without IMR consider the following potential options outlined and discussed in section 7.3:

- the development of an Asia-Pacific framework (section 7.3.2);
- the Pacific-wide initiative on IMR (section 7.3.3);
- cooperation between Pacific Island countries (section 7.3.4.11);
- analyze the effect on tourism and other industries (section 7.3.4.13);
- cooperation with regional regulators (section 7.3.4.15);
- trade agreements (section 7.3.4.16);
- potential best practice for regulators (section 7.3.4.9).

There can be an expected interest on their part in monitoring and, potentially wishing to be involved in, progression and development of IMR issues; given the difficulty for individual Pacific Island countries to act alone on IMR, and all regulators' need for assistance on this subject.

**Recommendation 4**

The specific option, beyond the mandate of this report and outlined and discussed in section 7.3.5, for Pacific Island countries to conduct a further study to ascertain if they are getting a fair share of the IMR revenue, is recommended for consideration.

If this option is pursued, it is proposed that the findings of that study could be used to assist Pacific Island countries (with possible assistance from ITU, APT and the EC) to:

- develop model agreements for charging rates and revenue share;
- negotiate standard agreements with major carriers.

## Annex A: DATA COLLECTION FORM

### ITU Study of Present Situation of International Mobile Roaming (IMR) in the Pacific

**Country:** \_\_\_\_\_

#### **Background:**

This study is intended to assist Pacific Island countries (the Cook Islands, Fiji, Kiribati, the Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, the Solomon Islands, Timor-Leste, Tonga, Tuvalu and Vanuatu) in providing awareness of the present situation with International Mobile Roaming (IMR) in the Pacific and, particularly, in addressing the high costs of IMR. Through the collection of data and information from these Pacific Island countries, an analysis and assessment will be undertaken to identify best practices and priority areas for improvement. This analysis will then be reported on.

#### **Website:**

If there is a specific government or operator website(s) in your country that contains any of the IMR information being sought please identify it (or them):

(Please check that any website referred to is working and up to date before including the details in this reply.)

#### **Legislation:**

4.1 What legislation, if any, sets out the requirements for IMR arrangements in your country, including pricing regulation, quality of service, costs, charges/tariffs and pricing structure, etc?

4.2 Please identify the legislation and where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of all relevant legislation to the Project Coordinator, Mrs Gisa Fuatai Purcell on fax +679 3220 346. If there is no legislation, please indicate that none applies.

#### **Regulations:**

5.1 What regulations have been put into effect in your country pursuant to any relevant legislation above that sets out the requirements for the following:

- (a) Provision of IMR services?
- (b) IMR pricing regulation, charges/tariffs and pricing structures or principles?
- (c) Any taxation arrangements affecting IMR provision costs (e.g. VAT or GST)?
- (d) Provision of consumer information and awareness requirements, including transparency?
- (e) IMR Competition policy or frameworks?
- (f) Measures to address/increase IMR availability?
- (g) Any other aspect of IMR?

5.2 Please identify the regulations and where they may be accessed electronically. If they are not accessible electronically please send a fax or scanned copy of all relevant regulations to the Project Coordinator as noted in Question 4. If there are no applicable regulations, please indicate that none apply.

**Responsibility for IMR:**

Who is responsible in your country for:

- (a) Making decisions on IMR?
- (b) IMR pricing regulation, or regulation of IMR charges/tariffs and pricing structures or principles?
- (c) Regulation or monitoring of the provision of consumer information on IMR?
- (d) Regulation of IMR competition policy or frameworks?
- (e) Monitoring or administration of IMR issues?

**Regulatory Framework and Guidelines:**

7.1 What Regulatory Framework and/or Guidelines have been published by the Regulatory Authority or other responsible government body in relation to IMR in your country?

7.2 Please identify the Regulatory Framework or Guidelines and where they may be accessed electronically. If they are not accessible electronically please send a fax or scanned copy of all relevant documents to the Project Coordinator as noted in Question 4.

{Note that the term Regulatory Authority both here and later in this document is meant to either be the Independent Regulatory Authority if one exists, or else that part of a Department or Ministry which is responsible for IMR and/or oversights of the provision of consumer information.}

7.3 If there are no Regulatory Frameworks or Guidelines, please indicate this.

**8. Orders or decisions in relation to IMR:**

What orders or decisions of the Regulatory Authority or other responsible government body are currently in force relating to IMR? Please identify where they may be accessed electronically. If they are not accessible electronically please send a fax or scanned copy of all relevant documents to the Project Coordinator as noted in Question 4. If none are currently in force, or exist, please indicate this.

**9. Licensed service providers:**

9.1 Please list the service providers licensed or authorized to provide:

- (a) Unified (general, covering all services)
- (b) Fixed services
- (c) Mobile services
- (d) Internet services
- (e) International gateway services
- (f) Other telecommunications services

9.2 Please identify where each licence may be accessed electronically.

9.3 If they are not accessible electronically please send a fax or scanned copy of the licenses to the Project Coordinator as noted in Question 4.

**10. Appeals:**

Is there provision for or rights of appeal against decisions or orders of the body referred to in Question 8 in relation to IMR? If so, to which body may an appeal be made?

**11. Process in relation to the making of Orders or decisions in relation to IMR:**

**What process was put in place before the making of the Orders referred to in Question 8 above? For example, was there an arbitration proceeding, or was there any form of industry or public consultation?**

**12. International Mobile Roaming availability:**

12.1 Is IMR available in your country? If so, is it available to both residents travelling overseas and visitors?

12.2 If international roaming is available in your country please identify and list all operators offering this service; including the associated overseas operators?

12.3 If IMR is not available in your country please indicate this.

12.4 Importantly, please indicate why IMR is not available and the main reasons for this?

12.5 Please outline any associated difficulties?

**13. Information on IMR Agreements:**

{Note that the term IMR agreement(s) both here and later in this document are also known and can be considered as Inter-operator Tariffs (IOTs).}

13.1 Are all, or any, of the providers of fixed, mobile, Internet or international gateway services that are involved in originating access, interconnection, routing or termination of calls or data traffic that have an IMR component, required to prepare and publish information on IMR agreements, or call charge rates including IMR rates? If so:

- (a) What services do the agreements cover?
- (b) What rates are published?
- (c) What IMR customer information is provided? Must they be published?
- (d) What transparency of these rates is provided? For example, website, pamphlet, information for visitors through an SMS or voicemail?
- (e) Which service providers are required to prepare and publish them?
- (f) Are the call charge rates/tariffs approved by the Regulatory Authority or part of the Department or Ministry with that authority?
- (g) Can the call charge rates/tariffs be accessed electronically? If so, please identify where they can be accessed. If they are not accessible electronically please send a fax or scanned copy of all relevant regulations to the Project Coordinator as noted in Question 4.

13.2 Is all, or any, of the information on IMR agreements in your country considered commercial-in-confidence? If so, please indicate this?

13.3 If only some aspects of the information on IMR agreements in your country are considered commercial-in-confidence, can you please provide the *non commercial-in-confidence* information?

13.4 If all of the information on IMR agreements in your country is considered commercial-in-confidence, is there any information that is *not commercial-in-confidence* that you can provide to assist this study?

**14. Current IMR agreements:**

14.1 What IMR agreements are currently in place or in force in your country? Please provide a listing of those agreements and the parties to which the agreement applies?

- 14.2 Are all, or any, of the IMR agreements in your country considered commercial-in-confidence? If so, please indicate this?
- 14.3 If all, or any, of the IMR agreements in your country are *not considered commercial-in-confidence*, can they be accessed electronically? If so, please identify where they can be accessed. If they are available and not accessible electronically, please send a fax or scanned copy of all relevant regulations to the Project Coordinator as noted in Question 4.
- 14.4 If only some aspects of the IMR agreements in your country are considered commercial-in-confidence, can you please provide the *non commercial-in-confidence* sections?
- 14.5 If all IMR agreements in your country are considered commercial-in-confidence, is there any material that is *not commercial-in-confidence* that you can provide to assist this study?
- 14.6 What procedure is followed in your country to establish all aspects of IMR agreements, including interconnection, access, routing, or termination agreements, wholesale charging rate agreements and overseas operator negotiations or agreements?
- 14.7 How were they negotiated/agreed? Was the Regulatory Authority or part of the Department or Ministry with that authority involved?
- 14.8 If the service providers are required to negotiate with each other in good faith, under what conditions can/will the Regulatory Authority or part of the Department or Ministry with that authority get involved? Would they?
- 14.9 How long did it take to negotiate these agreements?
- 14.10 What were the actions or issues that took up most of the time?
- 14.11 Outline any actions or factors which contributed to a successful negotiation?
- 14.12 Outline any actions or factors which contributed to a failed negotiation?

**15. Current interconnection, access and routing arrangements which include an IMR aspect:**

- 15.1 Do the current interconnection agreements or access arrangements, including routing arrangements, that are currently in force in your country cover IMR where it is available in your country? If yes, please indicate this? If not, why not and should they?
- 15.2 Can the agreements be accessed electronically? If so, please identify where they can be accessed. If they are not accessible electronically please send a fax or scanned copy of any relevant information to the Project Coordinator as noted in Question 4.
- 15.3 If the current interconnection agreements or access arrangements in your country are considered commercial-in-confidence, can you please provide any *non commercial-in-confidence* information or material to assist this study as outlined in Questions 13 and 14?
- 15.4 If possible, please provide information on, and a breakdown of, the current interconnection, access and routing arrangements?

**16. Current IMR service costs and charging rates/tariffs:**

- 16.1 What are the current IMR service costs and charging rates/tariffs (wholesale and retail) in your country? (Please provide information on this for both citizens who have roamed overseas and visitors)

- 16.2 Are all, or any, of the current operator IMR wholesale charging rates in your country considered commercial-in-confidence? If so, please indicate this?
- 16.3 If possible, please provide information on and a breakdown of, local operator IMR costs and charges, and overseas operator IMR costs and charges?
- 16.4 Please provide information on how roaming costs and charges are currently calculated? (See also Questions 20, 21 and 23).
- 16.5 Are you aware of bypass fraud? Is it an issue in your country?
- 16.6 Is double taxation applicable or an issue in your country?
- 16.7 Is a significant difference in the inbound and outbound roaming call or data traffic volume between two operators or two countries, creating an asymmetry between inbound and outbound call or data charges to the consumer?
- 16.8 If the current operator IMR wholesale charging rates in your country considered commercial-in-confidence, can you please provide any *non commercial-in-confidence* information or material to assist this study as outlined in Questions 13 and 14?

#### 17. Future IMR requirements:

Are there other plans to amend or introduce IMR requirements or regulatory frameworks in your country? What are they?

#### 18. Possible IMR solutions or areas for improvement:

- 18.1 Are you able to suggest or propose possible IMR solutions or areas for improvement to assist your country and/or Pacific island countries; particularly those that might address high cost of IMR for Pacific island countries? If so, please list and provide information on them?
- 18.2 What are the key areas for urgent improvement? Please identify?
- 18.3 Are there any regulatory issues affecting the provision of IMR or high IMR charges in your country?
- 18.4 In addition to the areas listed above, could a list of possible IMR areas for improvement in the Pacific include the identification of:
- Areas that Regulators and operators could work together to improve the customer experience? (For example, lower charges, improvement in the quality of service, improved transparency of IMR costs and charges, reduction in fraud, increased coverage and availability of IMR services)?
  - Any technical issues which might affect IMR costs? (For example, the impact of bypass and other types of fraud in the region)?
  - Possible areas for regional cooperation or pooling of resources?
  - Satisfactory agreements or negotiation outcomes that may be used as a benchmark or best practice?
  - Options and technical solutions (e.g. plastic roaming which allows a visitor to become a temporary subscriber to the visiting network through a prepaid SIM) which might assist?
  - Roaming capacity in the Pacific region?
  - Possible options and substitutes for mobile roaming?
  - Possible cost saving areas that might be able to be passed on to consumers?
  - Experts with the technical skills and experience in IMR; particularly commercial aspects?
- 18.5 Please advise whether any of the above might assist or could be applicable in your country?

**19. Staff resources:**

- 19.1 How many staff does the Regulatory Authority or part of the Department or Ministry with IMR authority have?
- 19.2 How many of these are available to assist in the resolution of IMR issues or disputes?
- 19.3 What qualifications do they have?

**20. External experts:**

Has the Regulatory Authority or part of the Department or Ministry with IMR authority used external experts for assistance on IMR issues in the last 5 years? If so please provide details.

**21. Methodologies used:**

What methodologies are used to establish the terms and conditions for access, originating, termination, routing or interconnection of calls or data traffic that have an IMR component, including costs and charges/tariffs (wholesale and retail) and for wholesale access to facilities and services? For example, calls from your country to a citizen when they have roamed overseas or inbound calls from a citizen of your country who has roamed overseas?

**22. Cost Models:**

- 22.1 Does your country use cost models to determine costs and charges/tariffs (wholesale and retail) for access, originating, terminating, routing, or interconnection of calls/data traffic that have an IMR component? (See the example above in Question 21 to assist you in answering this question).
- 22.2 If so, please describe the cost model?

**23. Benchmarking/best practices:**

- 23.1 Does your country establish IMR costs and charges/tariffs (wholesale and retail) through benchmarking/best practices?
- 23.2 If so, what benchmarking/best practice exercises have been completed?
- 23.3 Is the benchmarking/best practice based on regional or international practice?
- 23.4 Are you aware of any regional or international benchmarking/best practice?
- 23.5 If benchmarking is not used for determining IMR costs and charges/tariffs, what are benchmarks used for?

**24. Other methodologies:**

Are other methodologies employed in your country to determine costs and charges/tariffs (wholesale and retail) for access, originating, terminating, routing, or interconnection of calls/data traffic that have an IMR component?

**25. Any other information:**

- 25.1 If you are aware of, or would like to provide, any other relevant information (e.g. reports, presentations, and documents) on any aspect in the collection of data associated with IMR in the Pacific, please attach it to or include it in your response.



25.2 Are you able to identify a specific website(s) or Internet location for the provision of this information?

**Contact:**

Please nominate the person who should be contacted to clarify the answers above or for further information.

**Name:**

**Position:**

**Organization:**

**Phone:**

**Email:** -----



## Annex B: LIST OF PARTICIPANTS

No	NAME	DESIGNATION	COUNTRY	EMAIL
1	Mrs Pua Hunter	Director of ICT	Cook Islands	<a href="mailto:pua@pmo.gov.ck">pua@pmo.gov.ck</a>
2	Mr Jolden Johnnyboy	Assistant Secretary	Micronesia	<a href="mailto:transcom@mail.fm">transcom@mail.fm</a>
3	Mr Tuli Heka	Director, Niue Post and Telecommunications	Niue	<a href="mailto:tj@niue.nu">tj@niue.nu</a>
4	Mr Takkon Chin	Chief, Department of Communications	Palau	<a href="mailto:tchin@mail.palau.gov.net">tchin@mail.palau.gov.net</a>
5	Mr Kila Gulo Vui	Director, Regulatory and External Affairs	PAPUA NEW GUINEA	<a href="mailto:kgulovui@nicta.gov.pg">kgulovui@nicta.gov.pg</a>
6	Mr Donnie Defreitas	Regulator	Samoa	<a href="mailto:ddefreitas@regulator.gov.ws">ddefreitas@regulator.gov.ws</a>
7	Mr Feleti Tu'ihalamaka	Assistant Secretary, Ministry of ICT	Tonga	<a href="mailto:ftuihalamaka@mic.gov.to">ftuihalamaka@mic.gov.to</a>
8	Mr Tony Hosea	Senior Telecom Engineer	Vanuatu	<a href="mailto:tonyh@telecomregulator.gov.vu">tonyh@telecomregulator.gov.vu</a>
9	Mr Bwanouia Aberaam	Regulator	Kiribati	<a href="mailto:baberaam@regulator.gov.ki">baberaam@regulator.gov.ki</a>
10	Mr Anisi Penitusi	Chief Operating Officer	Tuvalu	<a href="mailto:apenitusi#">apenitusi#</a>
11	Mrs Gisa Fuatai Purcell	ITU Project Coordinator	Fiji	<a href="mailto:fuatai.purcell@itu.int">fuatai.purcell@itu.int</a>
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13	Mr Flierl Songol	Senior Policy Advisor	PAPUA NEW GUINEA	<a href="mailto:fsonghol@goPapua New Guinea.pg">fsonghol@goPapua New Guinea.pg</a>
14	Mr Tuaimalo Ah Sam	CEO, Ministry of ICT	Samoa	<a href="mailto:a.ahsam@mcit.gov.ws">a.ahsam@mcit.gov.ws</a>
15	Mr Richard Hill	ITU Counsellor, SG3	Geneva	<a href="mailto:ashish.narayan@itu.int">ashish.narayan@itu.int</a>
16	Mr Mac Cappelle	Operations Manager, National Telecommunications Authority	Marshall Islands	<a href="mailto:kcamka@ntamar.net">kcamka@ntamar.net</a>
17	Ms Mere Rakuita	Chairperson, Telecommunication Authority of Fiji (TAF)	Fiji	<a href="mailto:mrakuita@gmail.com">mrakuita@gmail.com</a>
18	Mr Sean Weekes	Director, ICT	Nauru	<a href="mailto:Sean.weekes@naurugov.nr">Sean.weekes@naurugov.nr</a>
19	Mr Dominic Moros	Pricing Analyst	PAPUA NEW GUINEA	<a href="mailto:dmoros@nicta.gov.pg">dmoros@nicta.gov.pg</a>
20	Mr Ron Box	CEO, Telecommunication Authority of Fiji (TAF)	Fiji	<a href="mailto:Ronbox47@yahoo.com">Ronbox47@yahoo.com</a>
21	Mr Fred Christopher	Manager, PITA	Fiji	<a href="mailto:pita@connect.fj">pita@connect.fj</a>
22	Mr Siasoi Sovaleni	Manager, ICT Outreach SPC	Fiji	<a href="mailto:siasos@spc.int">siasos@spc.int (1 day)</a>
23	Ms Unutoa	Spectrum Manager, OOTR	Samoa	<a href="mailto:UF@regulator.gov.ws">UF@regulator.gov.ws</a>
24	Ms Iva Fiti	Senior ICT Officer	Micronesia	<a href="mailto:evamao@gmail.com">evamao@gmail.com</a>
25	Mr Yoshi Kaneko	Executive Officer, National Telecommunications Authority	Marshall Islands	<a href="mailto:ytkaneko@ntamar.net">ytkaneko@ntamar.net</a>



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## National legislation

### **Cook Islands**

*Telecommunications Act 1989*

### **Niue**

*Communications Act 1989*

*Telephone Regulations 1972*

*Radio communications Regulations 1972*

### **Fiji**

*Commerce Act 1998*

### **Kiribati**

*Telecommunications Act 2004*

### **Marshall Islands**

*Communications Act 1987*

*National Telecommunications Authority Act 1990*

### **Nauru**

*Telecommunications Act 2002*

### **Papua New Guinea**

*Telikom Regulations Contract*

*Telikom General Carrier Licence*

*Telikom Public Mobile Licence*

*Digicel Public Mobile Licence*

*ICCC Act 2002*

*Telecommunications Act 1996*

*ICCC Code 2006*

### **Samoa**

*Telecommunications Act 2005 (amended 2008)*

### **Solomon Islands**

*Telecommunications Act 2009*

### **Timor-Leste**

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### **Tonga**

*Communications Act 2000*

### **Vanuatu**

*Telecommunications and Radio-communications Regulation Act 2009*







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