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INTERNATIONAL MOBILE ROAMING REGULATION – AN INCENTIVE FOR COOPERATION

February 2008

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1 INTRODUCTION – IMPORTANCE OF INTERNATIONAL MOBILE ROAMING

The rapid growth in the number of mobile subscribers across the world over the past decade -- now numbering 50 per cent of the population -- has dramatically changed the telecommunications 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 around the globe. Without doubt, mobile telephony offers huge advantages for individuals, businesses and economies. Nevertheless, the rise of mobile communications has raised at least one troubling issue which is currently being widely discussed among regulators, operators and end user associations -- international mobile roaming rates.

International mobile roaming services allow customers of a home mobile network operator to use mobile services when traveling abroad. These services are enabled due to a direct or indirect (either through a broker or aggregator) relationship between the home and visited operator. As a result of the worldwide expansion of mobile markets and increased demand for international communications, international mobile roaming revenues now constitute a significant portion of mobile operators' revenues and profits. Telecommunications analysts[1] estimate that international mobile roaming rates generate approximately 5 - 10 per cent of operators' revenues globally (in some cases up to 15 per cent[2]), and constitute an even bigger slice of their profits. However, due to the lack of any viable alternative to international mobile roaming services, customers (especially those who must make mobile international calls, such as business users) continue to use these services even in the face of high tariffs. Therefore, the subject of international mobile roaming charges is now of great interest to many governmental organizations.

The view that international mobile roaming charges are disproportionately high relative to costs has been expressed in a number of other studies[3] and surveys[4] as well as in regulatory debates[5]. A study on international mobile roaming charges in the Arab States conducted by the Arab Regulators' Network (AREGNET) in 2006[6], found that prices charged for international mobile roaming are unsatisfactory to consumers. Specifically, the study highlights that:

- International mobile roaming charges in the region are not transparent. The details of charges are not widely known, and are difficult for users to find;
- International mobile roaming charges change frequently. 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 international mobile roaming charges between different networks. In many countries with more than one mobile operator, international roamers are charged differently depending on the network they are using.

According to an ITU BDT report on GSM Mobile Networks in West Africa[7], even for postpaid roaming, operators require a security deposit varying from USD 377.29 to USD 1508.40. Some operators also apply activation fees. In addition, most operators are reluctant to divulge the details of the charges they apply, explaining that costs depend on the operator in the visited country.

The European Commission (EC) started closely monitoring international mobile roaming prices in Member countries of the European Union (EU) in 2005, launching a website on roaming prices[8]. According to the EC[9], there had been little overall change in the levels of international mobile roaming tariffs in the first year after the website was first put online. On average, international mobile roaming prices were four times higher than national mobile calls. These differences, according to the EC, could not be explained by costs incurred by the operators. Operators were charging their customers 300 - 400 per cent more than the cost of these calls[10]. In addition, the EC found that receiving a call while roaming was also very expensive. The EC claimed that there are no agreed inter-operator tariffs for "received calls" at a wholesale level, so that operators could offer their customers lower prices without changing international agreements. As a result, the EC decided to regulate international mobile roaming prices in the EU by imposing wholesale and retail price-caps on both incoming and outgoing roaming voice calls. The decision has generated a lot of discussions, and opinions on its impact vary. Nevertheless, the EU case is an example that other regional economic groups are examining as they address the issue.

It is important to note that international mobile roaming services go beyond the boundaries of a single country. The availability of international roaming services largely depends on contracts signed between home and foreign operators while prices charged are related to the pricing principles and rates of both the home and visited operators (with the involvement of a third operator in some case as discussed below). This suggests that international mobile roaming is linked to cooperation and coordination between operators as well as regulators.

This paper will address a variety of issues raised by international mobile roaming charges: how do they differ from charges for non-roaming international mobile calls (i.e. when a mobile subscriber calls an international number from its home country); what is the structure of their costs; is there a need for regulatory intervention and, if so, how could they be regulated; and finally, is cooperation and coordination on international mobile roaming regulation beneficial? Issues related to national roaming are addressed in the GSR Discussion Paper on Mobile Sharing.

2 CALCULATING INTERNATIONAL MOBILE ROAMING COSTS

Before analyzing possible strategies to international mobile roaming regulation, it is important to understand the fundamentals of this service. This section will briefly describe international mobile roaming services and analyze its cost elements.

2.1 What is international mobile roaming?

Traditional international mobile roaming is defined as the ability for a mobile customer to make and receive voice calls, send and receive data, or access other services, when traveling outside the geographical coverage area of the home operator's network, while using a visited operator's network but being billed by the home operator. The user's mobile phone number also remains the same.

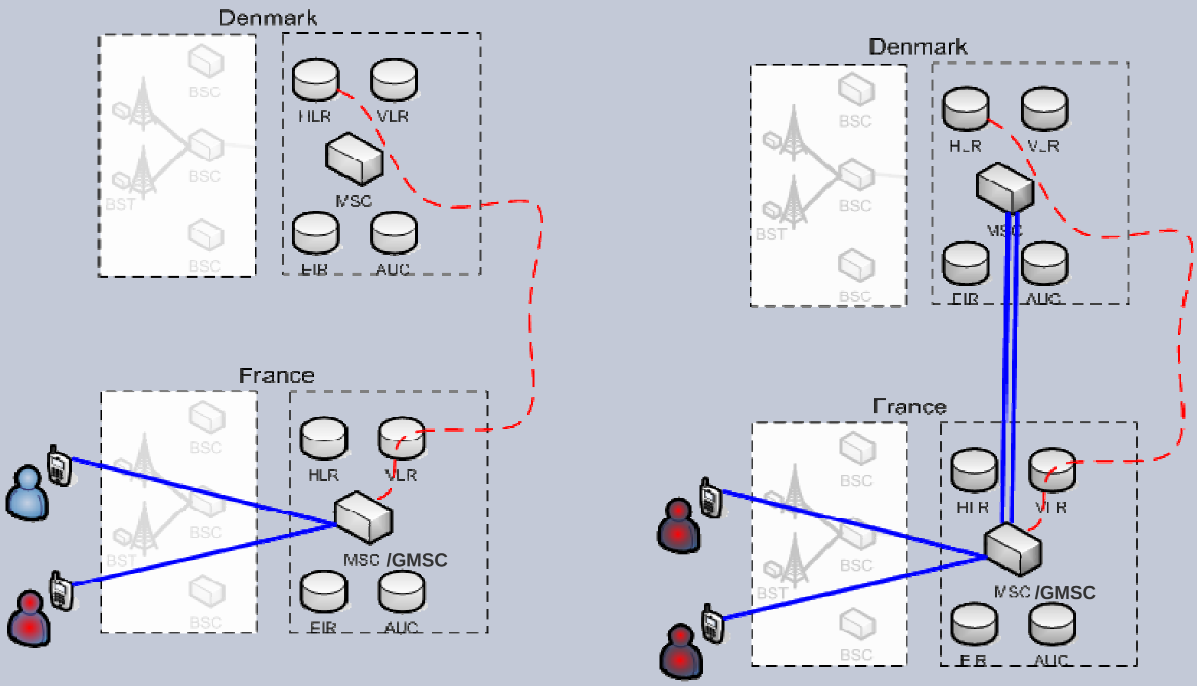
The details of international mobile roaming might differ among different types of mobile networks, but in general, the service could be described as follows:

- A visited network attempts to identify the subscriber's home network. If there is no roaming agreement between the two network operators, international mobile roaming service is impossible. 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, the visited network contacts subscriber's home network and requests service information about the roaming device and whether or not it should be allowed to roam;
- If successful, the visited network creates a temporary subscriber record for the device. The home network updates its information to indicate that the subscriber is using the host network to ensure that any information sent to that device will be correctly routed.
- Demanded calls are routed by visited and/or international transit and/or any fixed or mobile and/or home networks, 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.

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?arnumber=1594007

It is important to note that international mobile roaming covers not only voice services, but the data services of 2.5G and 3G mobile services as well, and is applicable to different mobile technologies currently used (for example, GSM or CDMA). However, this does not necessary imply that a subscriber of any mobile operator could roam in every mobile network of every country. Before deciding to use mobile phone overseas, a subscriber has to check:

- if the technology used (for example, GSM or CDMA) is supported in a destination country; and

- if the home mobile operator has an agreement with any mobile operator in the destination country.

Mobile operators seeking to offer international mobile roaming services to subscribers must conclude international roaming agreements. The legal roaming business conditions negotiated between the roaming partners are usually stipulated in these agreements. The GSM Association 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. The Australian Communications and Media Authority (ACMA), for example, has indicated that there are currently no agreements in place between Australian mobile operators providing CDMA services and overseas CDMA networks[11]. Consequently, an Australian 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. Devices can only work in a country with a different frequency allocation if they can support one or both of that country's frequencies (i.e. dual and triple band handsets).

2.2 Costs elements of international mobile roaming

As already mentioned, international mobile roaming agreements play an essential role in implementing international roaming. 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 can be negotiated as well.

Wholesale international mobile roaming charges (namely IOTs) involve the following elements:

- Mobile origination;
- Mobile/Fixed termination;
- International Transit;
- Roaming specific costs – costs incurred by operators for roaming-specific services, e.g. contracting, billing other operators, testing, specific signaling, etc.

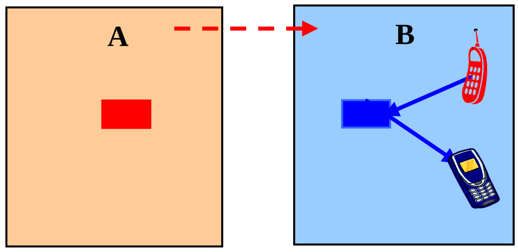
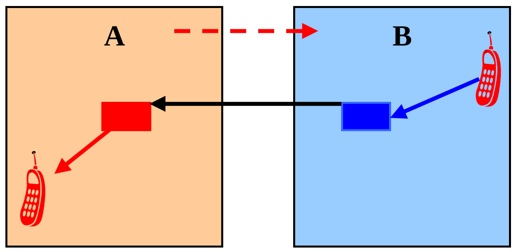
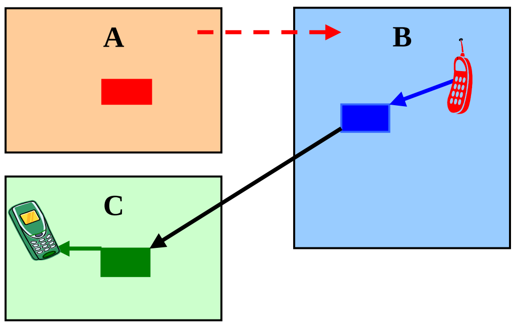
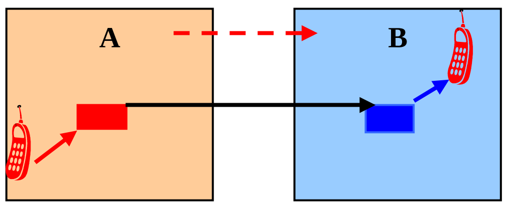
Retail international mobile roaming additionally includes specific retail costs (e.g. billing, marketing, etc.). Depending on the type of service supplied, it is possible to analyze each service according to the cost elements noted above.

There are four main types of international mobile roaming services:

- **Calls/ SMS/ other services inside a visited country** – when a traveler from country A goes to country B and makes a phone call inside the visited country (which means using mobile networks in country B). This might be a call to a subscriber of county B, to a subscriber of country A, which is also visiting country B, or to a subscriber of country C which is visiting country B.
- **Calls/SMS/other services from a visited country to the home country** - when a traveler from country A goes to country B and makes a call home. This might be a call to another subscriber of country A or to a subscriber of any other country which is visiting country A during the time of call.
- **Calls/SMS/other services from a visited country to a third country** - when a traveler from country A goes to country B and makes a call to country C. This might be a call to a subscriber of country C or to a subscriber of any other country which is visiting country C during the time of call.
- **Receiving calls/SMS/other services in a visited country** - when a traveler from country A goes to country B and receives a call from subscribers of either of the countries or even from third countries.

For the illustration of main international mobile roaming services and their cost structures see Table 1.

Table 1: Cost structure of international mobile roaming services

Call type	Cost elements	Illustration
Call inside a visited country A traveler from country A goes to country B and makes a call to a subscriber of country B.	Mobile origination in country B + *[National transit in country B]* + Mobile termination in country B + Roaming-specific costs + Retail-specific costs	
Call from a visited country to the home country A traveler from country A goes to country B and makes a call back home to a subscriber in country B.	Mobile origination in country B + International transit + Mobile or fixed termination in country A + Roaming-specific costs + Retail-specific costs	
Calls from a visited country to a third country 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.	Mobile origination in country B + International transit + Mobile or fixed termination in country A + Roaming-specific costs + Retail-specific costs	
Receiving a call in a visited country A traveler from country A goes to country B and receives a call from either of the countries.	Mobile termination in county B + International transit + Roaming specific costs + Retail specific costs	

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?

Mobile origination and mobile or fixed termination rates, which represent the major portion of costs in providing wholesale international mobile roaming, are usually regulated and well known in advance. In order to calculate how much a certain international mobile roaming service will cost, additional information about international transit, roaming-specific and retail-specific costs are needed. However, getting information about roaming-specific and retail-specific costs is a challenging task for regulators, since this information is often treated as commercial-confidential and is not freely available. Nevertheless, as a result of European investigation, some rough estimation of these costs is now available (see Table 2).

Intensive discussions about the level of retail costs took place during the EU debates. Initially the EC suggested adding a 30 per cent mark-up on the wholesale rate to cover retail costs (about 8 – 9 euro cents). Some consultancy companies[12] argued that retail costs alone constitute more than 30 per cent of roaming wholesale charges for at least some operators. Other researchers[13] pointed out that setting the margin at 30 per cent of the wholesale price is in line with the margin used for setting wholesale prices under the 'retail minus' principle, which is used for some wholesale telecom services. In Denmark, for instance, mobile service operators offer wholesale products at a price equivalent to the end user price minus 21 percent. This seems to be sufficient to cover both retail costs and some profit, as a number of service providers are able to operate on these terms. Nevertheless, certain consultants claimed[14] that retail costs are independent of wholesale costs and that a percentage mark-up is not appropriate. Instead, they argued, an absolute mark-up should be used, a view that was backed by the European Parliament. An absolute mark-up of 14 euro cents was calculated by the consultants commissioned by the European Parliament[15].

Table 2: Estimation of international mobile roaming costs in the EU, euro cents per minute

	Cost element	Cost per minute
Wholesale cost	Mobile origination	11.06 – 12.34*
	Mobile termination	11.06 – 12.34*
	Fixed termination	1.00 – 1.25*
	International transit	1.00 – 2.50
	Roaming-specific costs	1.00 – 2.00
Retail cost	Retail-specific costs (including reasonable rate of return)	14.00

Note: * average costs; values can vary based on calculation method chosen.

Source: Copenhagen Economics (2007). Roaming: An assessment of the Commission Proposal on Roaming.

The estimates provided in Table 2 are based on averages, but they at least provide an indication of the general level of wholesale and retail international mobile roaming prices compared to their costs. Of course, calculations and decisions based on averages will have a different impact on different operators. It will have more of an impact on small, independent operators that have no international gateways and which rely heavily on international mobile roaming revenues (e.g., in tourist areas).

2.3 Comparison of international mobile roaming and international mobile call costs

One of the suggested ways to avoid discussions on retail costs is to link international mobile roaming charges with charges for non-roaming international mobile calls, as proposed by the Arab States, see Section 4.2.1. This makes sense, given that cost structures of international mobile roaming and international mobile calls are very similar (see Table 3).

Table 3: International mobile roaming vs. international call

Call type	Cost elements
Retail charge for international call (call from mobile phone)	Mobile origination + International transit + Mobile or fixed termination + Retail costs
Retail charge for outgoing international mobile roaming call	Mobile origination + International transit + Mobile or fixed termination + **Roaming-specific costs** + Retail costs

In an ideal case -- when international mobile call rates are cost-oriented -- a regulator should only add roaming-specific costs in order to calculate costs of retail international mobile roaming services. This model takes into account regional specificities, such as non-liberalized international gateways, allowing international mobile call rates to be a proxy for evaluating retail international mobile roaming cost. The model, however, does not enable the regulator to calculate wholesale international mobile roaming costs or incoming international mobile roaming calls costs.

2.4 Other issues that can influence international mobile roaming costs

There are many additional issues that can be taken into consideration when trying to calculate costs and determinate reasonable charges for international mobile roaming. These include:

- **Liberalization of international gateways**. Liberalization of international gateways is one of the main prerequisites to introducing competitive prices for international mobile roaming. This is an argument often stressed by industry associations and understood by some regulators. For example, in its 2007 proposal on international roaming regulation AREGNET states that members of AREGNET encourage liberalization of international gateways[16]. According to the estimates of the GSM Association[17], international call prices decreased by 20 to 50 per cent in Arab countries that opened their international gateways to competitive provision. International roaming call prices between Arab countries with liberalized gateways are typically 25 per cent lower than between Arab countries with gateway monopolies. One of the cost elements of both international calls and international mobile roaming is international transit, and international gateways play a significant role in determining the costs of international transit. Liberalization of gateways could also lead to the increased quality of international communications and greater traffic volumes.
- **Market heterogeneity in a region** – in terms of population density, mobile and fixed penetration (maturity of the market), GDP and GNI per capita, and other economic indicators. Mobile incumbent operators in dense and mature mobile markets usually enjoy economy of scale and scope, meaning lower average cost of services.
- **Mobile operators' reliance on international mobile roaming revenues** – in terms of whether operators are providing services in tourist or non- tourist areas, and whether there are more incoming or outgoing mobile users. In some regions, like tourist destinations that are only popular at certain times of year, or areas near airports, mobile operators must make additional investments to satisfy the temporary increased demand, which has a negative impact on service costs.
- **Characteristics of the majority of operators in a country** – whether they are small or large, independent or part of an international alliance. Small and independent operators usually face higher costs, as they are not able to enjoy economy of scale and discounts offered by partners of alliances.

3 INTERNATIONAL MOBILE ROAMING TARIFF REGULATORY STRATEGIES

After analyzing international mobile roaming costs and actual prices charged, regulators might choose one of the following strategies:

- No direct regulation of any international mobile roaming tariffs;
- Regulating wholesale international mobile roaming rates only;
- Regulating retail international mobile roaming charges only;
- Regulating both wholesale and retail international mobile roaming rates.

This section provides a brief overview of each strategy.

3.1 No direct regulation

Regulators may decide not to take any policy and/or regulatory measures directly related to international mobile roaming rate regulation. Market and technological developments described below suggest that international mobile roaming markets could, to some extent, evidence increased competition and decreased roaming prices even without direct regulatory intervention:

- **Traffic redirection**. Historically, international roaming traffic was usually distributed randomly among operators of visited countries. This gave little incentive for operators to compete for roaming traffic by offering lower wholesale roaming rates (since such a strategy would not have warranted an increased share in roaming traffic). However the recent emergence of directing technologies allows operators to direct up to 80 – 90 per cent of their users' traffic to the networks of their preferred roaming partners[18]. They can then direct more roaming traffic onto partner networks in return for lower wholesale prices. This has led to wholesale discounts of up to 75 per cent in Europe and North America[19]. Some consultants[20] predict that retail roaming prices will fall by around half by 2011 because of greater transparency and technological evolution.
- **Rise of the groups and alliances** of mobile operators together with technical advances has fostered the internalization of roaming traffic within partner networks or groups and, potentially, competition for it.
- **Self-regulatory measures**, taken by industry associations, such as greater transparency through websites and codes of conduct, could have an impact on international mobile roaming prices.

Furthermore, proponents of the "no regulation" strategy claim that any reduction in international mobile roaming revenues may cause a "water bed" effect, whereby operators would seek to make up lost revenue elsewhere. This would mean that tariffs of domestic calls may rise as tariffs of international mobile roaming calls decline. In turn, this could threaten investment in the mobile sector. In the view of some consultants[21], it is more likely that the cost of domestic mobile calls will simply decline more slowly than before and/or mobile operators will reduce subsidies for handsets.

However, while deciding on a regulatory strategy, regulators can also take into account that:

- Available research suggests that traffic direction techniques do not guarantee downward pressure on wholesale tariffs. For example, they do not guarantee that direction of all roaming traffic[22] will be agreed in a cooperative manner (i.e., agreed reciprocally between partners). Moreover, customers can manually register with networks different from those preferred by the home operator. Every network can have coverage problems, even on a temporary basis, meaning that in cases of a gap in the preferred network, customers may register on a different network. Several studies[23] [24] confirm that the increased adoption of ever more efficient traffic control techniques has not necessarily been accompanied by a decrease in international roaming tariffs.
- The rise of alliances and groups could have an exclusionary effect on some smaller operators which would not be able to enjoy the wholesale rates applied within these alliances and groups;

- Substantial time may be needed until market developments will provide satisfactory results. Some analysts[25] believe that the latest technological developments such as IP mobile telephony may only resolve these market imperfections in the long term.
- During the debate in the EU, industry announced some initiatives to reduce wholesale and retail roaming prices. But according to the EC[26], those initiatives were a response to the threat of regulation as opposed to genuine competitive forces. This may indicate that in the absence of such threats there would eventually be a return to higher prices.
- Without regulatory intervention it might be almost impossible to wean operators off roaming revenues in developing markets (especially, where there are big disparities between the numbers of people coming to the country, e.g. as tourists, and those going abroad). In India, for example, foreign visitors pay up to 30 times more than locals to place the same call[27].
- There is no real alternative to international mobile roaming. The option to buy a local SIM card when traveling (known as “plastic roaming”) may not be very attractive, because:
    - consumers lose or temporarily do not use their very important identifier – their telephone number;
    - consumers still require additional information – e.g. which of the operators operating in the country offers cheapest national calls or better QoS;
    - consumers may find it more difficult to resolve disputes with operators;
    - some operators which provide phones for their customers “lock” the phones making it impossible for consumers to change SIM cards while travelling abroad.

Therefore it seems that even though market/industry-led developments could favorably influence outcomes of the international mobile roaming market, some direct or indirect regulation may be beneficial in assisting in these developments, providing more rapid results and reducing the possibility of negative outcomes (such as the exclusion of smaller operators).

3.2 Wholesale regulation only

Since it is widely recognized that wholesale roaming rates play a significant role in retail international mobile roaming pricing one reasonable option could be to only regulate wholesale rates. Because wholesale tariffs (IOTs) are agreed bilaterally between the home and visited network operators, it should be fairly easy to collect and compare information about nominal wholesale tariffs, in particular since international roaming agreements usually follow a framework defined by industry associations. This makes implementation of such regulation relatively easy as well. The main issue of this regulatory approach, however, is to ensure that wholesale price reductions result in reductions in retail roaming prices. The European Regulators Group (ERG)[28], which initially suggested employing wholesale roaming regulation only, later agreed that a form of retail price control may be necessary at a later stage.

Table 4: Wholesale regulation only

Advantages	Disadvantages
1. Likely to avoid “water bed” effect on prices of other services. 2. Relatively straightforward to implement. 3. Leaves enough flexibility in retail pricing. 4. Relatively easy to collect information on wholesale tariffs.	1. Risk that wholesale rate reductions will not result in reduced retail rates and will lead to higher retail profit. Or the impact on retail rates will take a lot of time. 2. Limited means to influence retail prices – reliance on competition.

3.3 Retail regulation only

The most obvious and immediate way to reduce retail prices is to put retail regulation in place. However, in the absence of corresponding wholesale regulation, retail regulation alone could lead to significant market distortions, primarily in the form of possible margin squeezes, implemented by larger operators. The outcome of retail-only regulation depends on whether wholesale prices in effect are low and whether retail margins are such that retail-only regulation would bring about a decrease in retail prices without creating a price squeeze for certain operators.

As the EC noted in its assessment report, retail-only regulation is likely to benefit larger operators which already enjoy lower-than-average IOTs, and would not address the problems faced by smaller players.

Table 5: Retail regulation only

Advantages	Disadvantages
1. Effects retail prices directly and immediately. Consumers feel benefits immediately. 2. Implementation is easy and straight forward. 3. Simple, clear and well understood method by consumers, if price cap method has been chosen*. Protection of consumer rights benefit from this simplicity as well.	1. No control on wholesale level could lead to “margin squeeze”, which means that the margin between the wholesale and retail rate is so small that efficient competitors are no longer able to profitably offer their services. 2. Retail pricing flexibility constrained and may reduce incentives for operators to offer different retail tariffs and packages. 3. Uniform retail price control would cause different pressure on different operators (more pressure on small, independent operators in tourist areas). 4. Difficult to estimate – how high retail prices should be, because of the asymmetry of information between operators and regulators and the great variety of retail tariffs.

Note: *A number of methods for implementing retail regulation exist, but the most effective is some form of price control, which can also be achieved in a number ways.

3.4 Combination of both

As both regulatory approaches have their advantages and disadvantages, the third option is the implementation of both wholesale and retail price control. If market forces proved insufficient to guarantee substantial pass-through of wholesale gains to the retail level, retail price control might be needed. In fact, this was the case in the EU. Despite some gains at a wholesale level, average retail charges remained high, with margins well above 100 per cent. Economic theory confirms that players do not necessarily have an incentive to use monopoly profits made at the wholesale level to compete for the acquisition and retention of domestic retail customers[29]. There is therefore a serious risk that if applied at the wholesale level only, the ultimate aim of regulation would not be achieved. Therefore, if regulators seek to have immediate results without causing significant market distortions, the combination of retail and wholesale regulation might be considered as the way out.

Table 6: Wholesale and retail regulation

Advantages	Disadvantages
1. Effects retail prices directly and immediately. Consumers feel benefits immediately. 2. "Margin squeeze" control.	1. Retail and wholesale pricing flexibility constrained and may reduce incentives for operators to offer different tariffs and packages. 2. Uniform price cap control would cause different pressure on different operators (more pressure on small, independent operators in tourist areas). 3. Some price rebalancing is likely to occur. 4. Difficulties in estimating price caps, implementation could be quite time consuming.

4 REGULATION OF INTERNATIONAL MOBILE ROAMING CHARGES: CASE STUDIES

4.1 The EU roaming regulation

4.1.1 History of roaming regulation in the EU

The only notable example of roaming price regulation is found in the European Union. Roaming within the EU is covered by Regulation No. 717/2007 of 27 June 2007[30]. This Regulation imposes European-wide price-caps on wholesale tariffs and retail rates (called Eurotariff). The European Regulation is the result of a long procedure which must be put into perspective for the results to be fully understood.

The tension between mobile network operators and the European Commission grew gradually over time. Table 7 presents a brief overview of the chronology of events starting from the 1999 sector inquiry launched by the European Commission[31].

Table 7: Chronology of events related to international roaming in the EU

Data	Event
July 1999	The Commission launched a sector inquiry in-to mobile roaming prices
July 2001	Inspections at the premises of MNOs in the UK and Germany
February 2003	Wholesale roaming services are included in the Recommendation
July 2004	The Commission sent statements of objections to two UK MNOs: O2 and Vodafone
February 2005	The Commission sent statements of objections to two MNOs in Germany: T-Mobile and Vodafone
March 2005	The ITRE Committee of the European Parliament organized a hearing on international roaming with NRAs and market players
October 2005	The Commission opened a consumer-oriented website publishing the prices of international roaming across Europe
December 2005	The ERG alerted the Commission that measures taken by the NRA would not resolve the problem of high prices of roaming services
December 2005	The DG Competition opened an ex officio investigation in Members States under article 31 EC Treaty
December 2005	The European Parliament Resolution EP 2005/2052(INI) called the Commission to develop new initiatives concerning the high charges of roaming services

March 2006	The European Council pointed out the importance for competitiveness of reducing roaming charges
February - March 2006	First phase of the public consultation on international roaming
March 2006	Second version of the "international roaming" website
April – May 2006	Second phase of the public consultation on international roaming
May 2006	Hearing on "International roaming – Its economic implication" organized by the European Parliament ITRE and IMCO Committees
July 2006	The Commission published a proposal for regulation from the European Parliament and the Council on roaming on public mobile networks within the Community, together with an impact assessment of policy options related to this proposal
January 2007	Hearing organized by the Industry and Internal Market Committee on the proposal of regulation
April 2007	Report by ITRE and adoption by the Committee
23rd May 2007	Vote at the European Parliament
7th June 2007	The Council approves rules on roaming charges

Note: MNO – Mobile Network Operator

ITRE – Committee on Industry, research and Energy

NRA – National Regulatory Authority

ERG – European Regulatory Group

IMCO – Committee on Internal Market and Consumer Protection

Source: Lescop, D., (2007). Regulating International Roaming Charges: Why Less When More Is Possible? # Communications & Strategies, no. 66, 2nd quarter 2007.

Two major events were especially important, as they greatly contributed to the final result. One is the EC efforts to solve the international mobile roaming issue by introducing wholesale roaming services into the list of markets that may need *ex-ante* regulation. By the end of 2006 only Finland and Italy had concluded the formal procedure for the wholesale international roaming market, with the publication of a final decision[32]. The outcome of these first market analyses showed that, despite competition problems, the tools provided by the existing regulatory framework did not allow NRAs to take effective and decisive action to address international roaming problems and ensure that end users fully benefit from regulation. Since the action of National Regulatory Authorities (NRAs) was limited to the wholesale part of the market, any action taken by a particular NRA could have no effect on its own domestic consumers. The roaming case was caused the failure of both competition law instruments and the existing electronic communications framework[33].

The second event was the EC proposal on international mobile roaming rates regulation submitted in 2006, which marked the beginning of very intensive discussions between all stakeholders. The proposal of the European Commission set maximum price limits for the provision by all mobile operators of roaming services at wholesale and retail levels. The Commission considered the wholesale level first and stated that a good proxy for the underlying costs of a mobile call is twice the mobile termination rate (MTR). The upper wholesale limit for a roaming call within the visited country was 2 x MTR. To take into account additional costs involved in a transnational call, it was suggested that the upper boundary for a home or third country call should be set at 3 x MTR. Finally, for a call received, the upper boundary was 1 x MTR since it only requires termination. The Commission suggested MTR to be an EU wide average of the national peak rate MTRs (the last calculated rate was 11.6 eurocents). Retail ceilings were set at a 30 per cent margin above the underlying wholesale limits in line with the average Earnings before Interest and Taxes (EBIT) margin of 26.8 per cent in the European mobile sector in 2005[34].

The initial EC proposal was followed by:

- A draft opinion of the Committee on the Internal market and Consumer Protection for the Committee on Industry, Research and Energy (ITRE), published on 9 February 2007. There were several changes suggested, including:
    - To use the national average MTRs instead of national peak MTRs;
    - To use the 75th percentile of average (weighted average of peak and off-peak) mobile termination rates (last calculated rate was 12.34 eurocents);
    - To set the same upper wholesale boundary for all roaming calls - 2 x MTR.
- A report from ITRE, published in April 2007, suggested the following changes:
    - To calculate MTR as an average of peak and off-peak rates;
    - For the purpose of simplicity and transparency, to refer to actual roaming prices and not formulas for retail roaming prices.
- The final text was adopted by the European Parliament on 23 May 2007. Following discussions at the governmental level the result was higher rates than tabled in previous proposals. Price caps are defined in nominal terms and MTRs are used as benchmarks only. This likely reflects that the final outcome of the EU roaming debates was a compromise between all stakeholders. See Table 8 for illustration of changes in price cap values during the debates.

Table 8: Price caps evolution in the EU

		The EC proposal		EP 1st draft opinion	EP draft report	EP final decision
	Type of call	Formula	€-cents/min	€-cents/min	€-cents/min	€-cents/min
Whole-sale	Calling within a country	2 x MTR	23.20	24.68	23	30 (1st year) 28 (2nd year) 26 (3rd year)
	Calling home or to a third country	3 x MTR	34.80			
Retail	Calling locally	2 x MTR + 30%	30.16	38.68	40	49 (1st year) 46 (2nd year) 43 (3rd year)
	Calling home or to a third country	3 x MTR + 30%	45.24			
	Receiving a call	1 x MTR + 30%	15.08	26.34	15	24 (1st year) 22 (2nd year) 19 (3rd year)

Note: 1 MTR = 11.60 eurocents per minute

VAT excluded

Source: Copenhagen Economics (2007), Study Roaming: An assessment of the Commission Proposal on Roaming; Falch, M., Henten, A., Tadayoni, R. (2007), Regulation of international roaming charges the way to cost based prices?; EP (2007), Mobile roaming: EP committee votes for € 0.40 cap on calls made while abroad at www.europarl.europa.eu/news/expert/infopress_page/058-5108-101-04-15-909-20070410IPR05075-11-04-2007-2007-false/default_en.htm

According to the final text of the EU Regulation the average wholesale charge that a mobile operator of a visited network may levy on a mobile operator of a roaming customer's home network for a call originating on that visited network shall not exceed 30 eurocents per minute, inclusive *inter alia* of origination, transit and termination costs. The price cap shall decrease to 28 eurocents on 30 August 2008 and to 26 eurocents on 30 August 2009. The EU Regulation does not differentiate between international mobile roaming calls when calling within a country and international mobile roaming calls when calling to a third country.

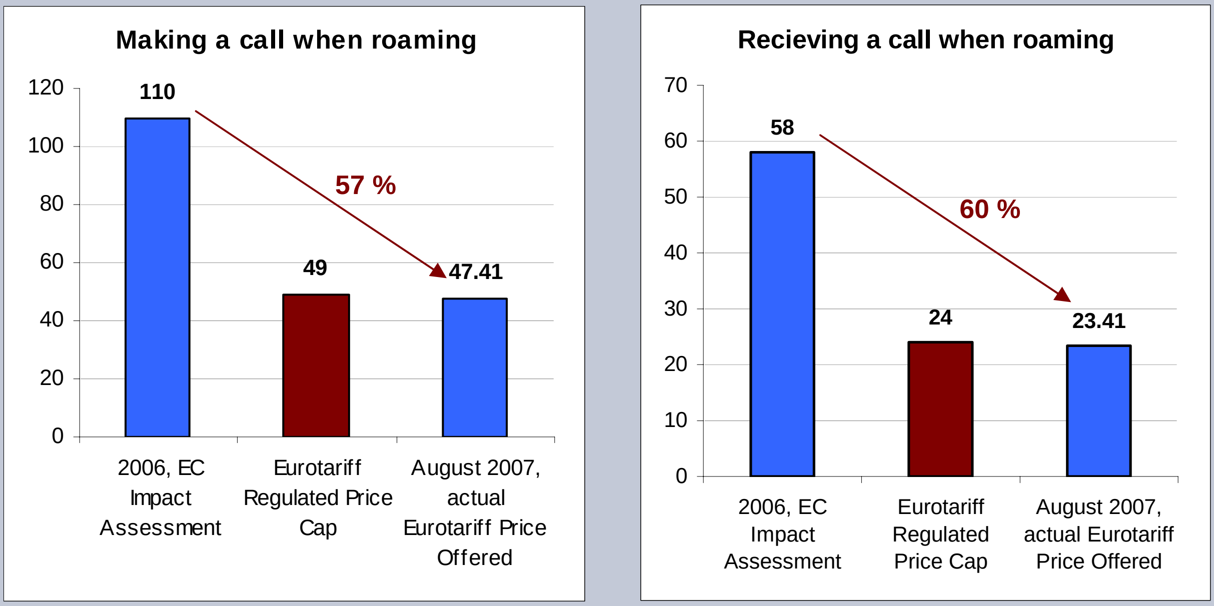
The retail charge (excluding VAT) of a Eurotariff which a home provider may levy on its roaming customer for the provision of a voice call shall not exceed 49 eurocents per minute for any call made, and 24 eurocents per minute for any call received. The price ceiling for calls made shall decrease to 46 and 43 eurocents, and for calls received to 22 and 19 eurocents, on 30 August 2008 and on 30 August 2009 respectively.

The EU Regulation also includes requirements for transparency of retail roaming charges. It requires operators to provide their subscribers with free-of-charge basic personalized pricing information on applicable roaming charges when they enter a foreign country. This information shall include the maximum charges a customer may be subject to under his/her tariff scheme for making calls within the visited country and back to his home country, as well as for calls received. European customers also have the right to request and receive, free of charge, more detailed personalized pricing information on the roaming charges that apply to voice calls, SMS, MMS and other data communication services, by means of a mobile voice call or by SMS.

4.1.2 First results

It is premature to judge the success or failure of the EU Regulation at this stage. First results, however, provided by the European Regulatory Group (ERG) and the EC[35], suggest that consumers in the European Union have been paying up to 60 per cent less for using their mobile phone abroad since summer 2007. Standard prices of international mobile roaming before the regulation were, on average, 110 eurocents per minute and 58 eurocents for receiving calls. Three months after the Regulation came into force these prices were 47.41 and 23.41 eurocents per minute respectively (see Figure 1).

Figure 1: Price changes of international mobile roaming in the EU when making a call and receiving a call abroad



Note: These are average prices

Source: European Commission, 2007

As a result, the EC, found that a number of operators throughout Europe have been offering Eurotariffs below the maximum levels allowed (See Table 9). The lowest Eurotariffs in Europe were found in the Netherlands (20 eurocents both for calls made and received), the United Kingdom (31.57 eurocents for calls made and 12.63 eurocents for calls received), Ireland (32.23 / 15.70 eurocents), Belgium (37.19 / 23.14 eurocents) and Austria (37.50 / 20.83 eurocents)[36]. This, according to the EU, could be the first sign that competition is evolving, even though more evidence is needed to show that other operators are following this model. At the same time some opponents have argued[37] that, from their point of view, there is a noticeable reduction in competition in voice roaming prices in the EU due to the recent Regulation. These opponents note that there are only a few operators offering tariffs below the cap, mainly the more innovative tariffs (like bundles or Passport) launched before regulation.

Table 9: Retail prices of international mobile roaming in some EU countries (October 2007), eurocents

	Eurotariffs	The Netherlands	UK	Ireland	Belgium	Austria
Calls made	49	20	31.57	32.23	37.19	37.50
Calls received	24	20	12.63	15.70	23.14	20.83

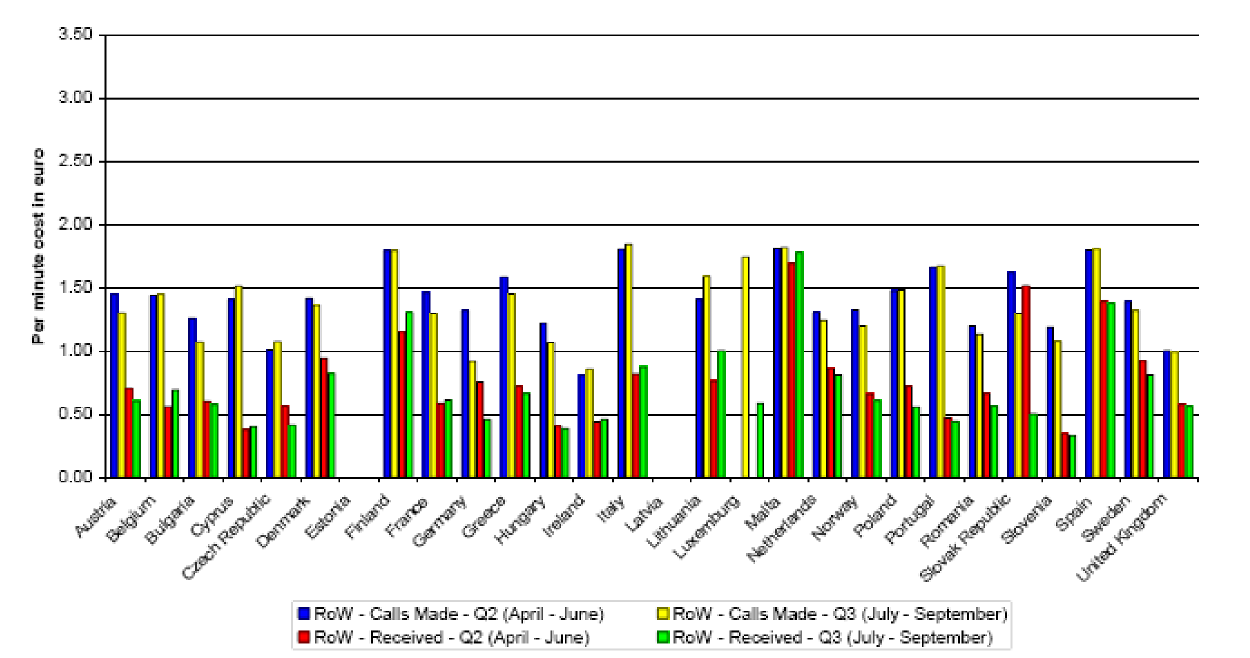
Source: Reding V. DG for Information Society and Media (2007). Eurotariff: Three months later at http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1445&format=HTML&aged=0&language=EN&guiLanguage=en

ERG estimated[38] that around 200 million mobile subscribers across Europe were able to benefit from Eurotariff rates at the end of August 2007. The EC estimated[39] that over 400 million EU citizens will be benefiting from the Eurotariff by the end of September. According to the ERG report, many providers of international roaming services offer the Eurotariff as the default roaming tariff, but importantly consumers are still free to choose alternative roaming tariffs where these might better suit their needs since several providers also offer other roaming tariffs. According to the ERG benchmark data report on international roaming for April to September 2007[40], many roaming charges show a clear reduction between the April to June and the July to September periods. ERG compared roaming data of the 2nd and 3rd quarter of 2007. Between these periods the average retail charge across Europe for voice roaming calls was reduced from 0.69 to 0.62 eurocents per minute billed. The corresponding average retail charge for voice roaming calls received reduced from 0.34 to 0.30 eurocents per minute billed.

ERG monitored prices of roaming voice calls that are not subject to the provisions set out in the EU regulation (i.e. calls to a non-EU country or received form a non-EU country), since during the regulatory debates there were concerns that European operators might raise the wholesale rates they charge non-European operators when their customers roam in their networks. According to the ERG data, prices for these calls, both making and receiving, remained fairly constant (see Figure 2). Although SMS and data are currently excluded from EU regulation, they considered it important to collect information on these services as well. According to the data collected, the average charge for sending an SMS within the EU remains unchanged, but in some countries an increase in this charge is observed (see Figure 3). As with SMS, the average price of a megabyte of data roaming varies considerably across different EU countries. The average EU price of a megabyte of data roaming reduced slightly between the second and third quarter of 2007: from 5.51 to 5.24 euros.

ERG also gathered information related to traffic direction or traffic steering, i.e., operators' ability to steer traffic onto a preferred or partner network. In many studies on international roaming[41] there were concerns expressed that discounts that members of alliances enjoy at a wholesale level are rarely replicated at the retail level. The ERG study[42] found that none of the providers that responded to the information request stated that traffic steering was used to the disadvantage of consumers through higher charges. In general such techniques were used to offer consumers a better deal, through either lower retail price or enhanced services, or both.

Figure 2: Prices for an international mobile roaming voice call, when a call is made to or received from a non-EU country (billed minutes, April – September 2007)



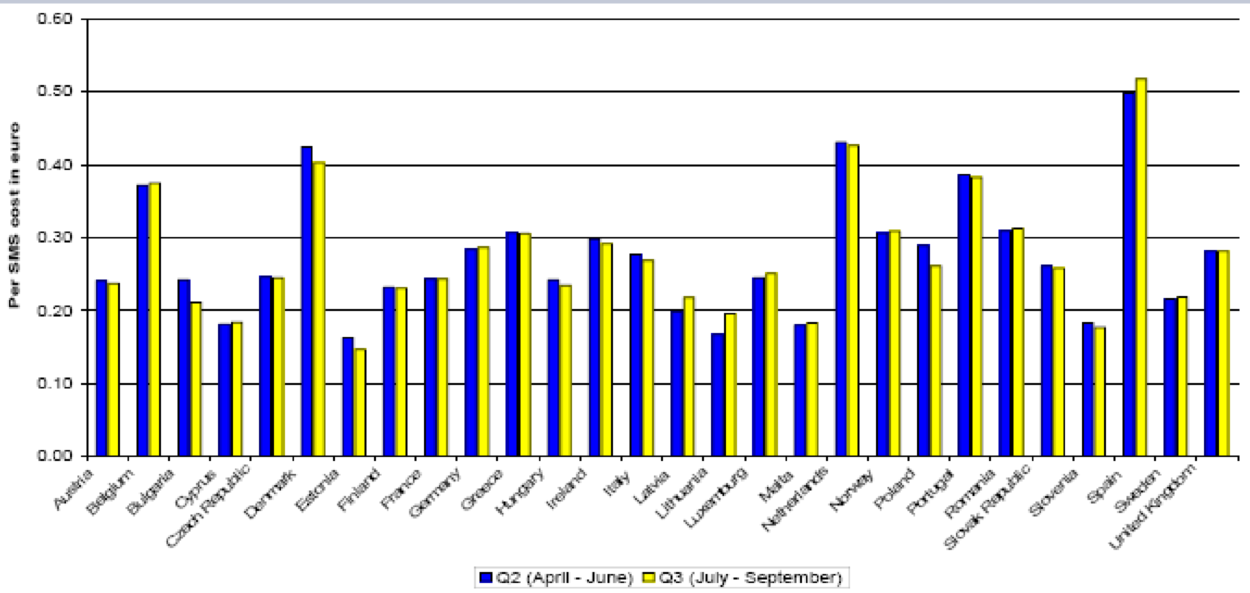
Note: Average: Calls made Q2 - € 1.37; Q3 - € 1.31

Calls received Q2 - € 0.69; Q3 - € 0.66

RoW – Rest of World

Source: ERG (2008), International Roaming, ERG benchmark data report for April and September 2007 at http://erg.ec.europa.eu/documents/docs/index_en.htm

Figure 3: SMS – price per message roaming (April – September 2007)



Note: Average: Q2 - € 0.29; Q3 - € 0.29

Source: ERG (2008), International Roaming, ERG benchmark data report for April and September 2007 at http://erg.ec.europa.eu/documents/docs/index_en.htm

After regulating prices of international mobile roaming voice calls, the EC has set its sights on prices of SMS and date transfer. The EC states that it cannot accept extraordinary mobile operators' profits on roaming customers and from time to time expresses its considerations about possible regulation of international mobile data roaming[1]. The latest public message was given by EU commissioner Viviane Reding during the Mobile World Congress in Barcelona, in February 2008[43]. The EU Commissioner said that the EC would like to see credible price reductions of international mobile SMS and data roaming by the whole industry on a voluntary basis before July 1 2008. Based on the offers on the market on that date, the EC will decide whether or not further regulation will be required.

The EC[44] indicated that it will carefully monitor the situation in the market, including additional possible problems like inadvertent roaming, impact on smaller operators, traffic steering and domestic mobile prices. ERG will benchmark data for every 6 months[45]. By the end of 2008 the EC[46] will report to the European Parliament and the Council about:

- Whether the objectives of the current regulation have been met?
- Should the regulation be extended?
- Is there any need to regulate roaming data services?

This should encourage mobile operators to make changes in prices of some roaming or even domestic services. Knowing the fact that once in place price cap regulation could be hard to stop, since there will always be the suspicion of a price rise by SMP operators[47], it is likely operators will resist any attempt to regulate. Therefore, it is safe to say that the tension between mobile network operators and the European Commission will continue.

4.2 Regulation of international roaming outside the EU

4.2.1 Initiatives in Arab States

One of the most notable initiatives to regulate international roaming prices outside the EU is found in the Arab States.

As already mentioned, in 2006 the Arab Regulators' Network (AREGNET) conducted a study on international mobile roaming prices in the Arab States, which found that retail prices charged for international mobile roaming are unsatisfactory. According to the results of the study[48], the variation in price per minute of calls to a home country while roaming ranges from 200 per cent to 1000 per cent, indicating great variability in roaming prices among Arab States. Prices per minute of roaming calls within a country are from 5 to 15 times higher than prices of regular local calls, which show a huge difference in prices within the same country.

In June 2006, following the results of the study, the Arab Telecommunications and Information Council of Ministers asked ARENGET to start regulating international mobile voice call roaming by January 2007. In May 2007, the ARENGET Plenary adopted a recommendation to be presented to the Arab Telecommunications and Information Council of Ministers. In July 2007, the 11th Ordinary Meeting of the Arab Telecommunications and Information Council of Ministers considered the recommendation. The initial AREGNET proposal to regulate retail roaming rates only was as follows[49]:

- A call from an Arab consumer to his/her home country should not exceed by more than 15 per cent a mobile international minute price from his/her original country to a visiting country;

[1] "I would like to say one word about the high roaming prices for mobile data. In cooperation with the national regulatory authorities, we will monitor data roaming prices during the next eighteen months. The operators should know this, heed these warning signals very carefully and bring the prices down to normal by themselves in order to avoid further regulation. " – Quote from the V. Reding speech 07.06.2007 at http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=3455

"This initial ERG report published today confirms the general trend towards lower roaming prices but it would be premature to draw firm conclusions at this stage. However, on the basis of the figures in the report, I remain concerned about prices for SMS and data roaming services. We will watch developments very closely and respond appropriately by the end of 2008." – said Viviane Reding, the EU Telecoms Commissioner, 17.01.2008 at www.europa.eu/rapid/pressReleasesAction.do?reference=IP/08/58&format=HTML&aged=0&language=EN&guiLanguage=en

- A call from a visiting Arab consumer from his/her mobile phone to a mobile phone in a visiting country should not exceed by more than 15 per cent a local minute price of a visiting operator;
- A call from a consumer to any Arab country other than his/her original country should not exceed a mobile international minute price from his/her original country to the other Arab country by more than 15 per cent ;
- A price for receiving a call should not exceed a local minute price in a visiting country.
- Wholesale prices applied between operators are not regulated, leaving these prices to be agreed through bilateral agreements.

The meeting did not approve this proposal mainly because it was considered incomplete, and a revised recommendation was subsequently prepared. The new proposal suggests regulating both wholesale and retail charges as follow (summarized in Table 10):

- **Wholesale rate for outgoing calls to home country or third Arab country.** Wholesale roaming rates for calls home or to a third country should not exceed the visited operator's retail charge for international calls to a respective country plus an additional margin of 50 per cent for the first year, 40 per cent for the second year and 30 per cent subsequently.
- **Wholesale rate for outgoing call within visited country.** Wholesale roaming rates for a call inside the visited country should not exceed a visited operator's retail charge for local calls in the country plus an additional margin of 50 per cent for the first year, 40 per cent for the second year and 30 per cent subsequently.
- **Retail rate for all outgoing calls.** Retail rates for outgoing calls should not be higher than a wholesale rate for an outgoing call plus and additional margin of 30 per cent.
- **Wholesale rate for an incoming call.** A visited mobile operator, as well as any intermediate visited country's international facilities operator, must not charge the operator of a subscriber's home network, or any intermediate home country's operator of international facilities, a wholesale rate that would be higher than a normal rate applied for terminating an international call.
- **Retail rate for an incoming call.** An operator of a subscriber's home network should not charge its subscriber a retail rate higher than its retail charge for international calls to a visited network.

Table 10: Suggested regulation of international roaming rates in the Arab States

Call type	Wholesale rate	Retail rate
Call to a home country or to a third country	Visited operator's retail charge for international calls* to a respective country x [1.5; 1.4; 1.3]**	Wholesale rate x 1.3
Call within a visited country	Visited operator's retail charge* for local calls x [1.5; 1.4; 1.3]**	
Call received	Not higher than a normal rate for international call termination	Home operator's retail charge for international calls to a visited operator

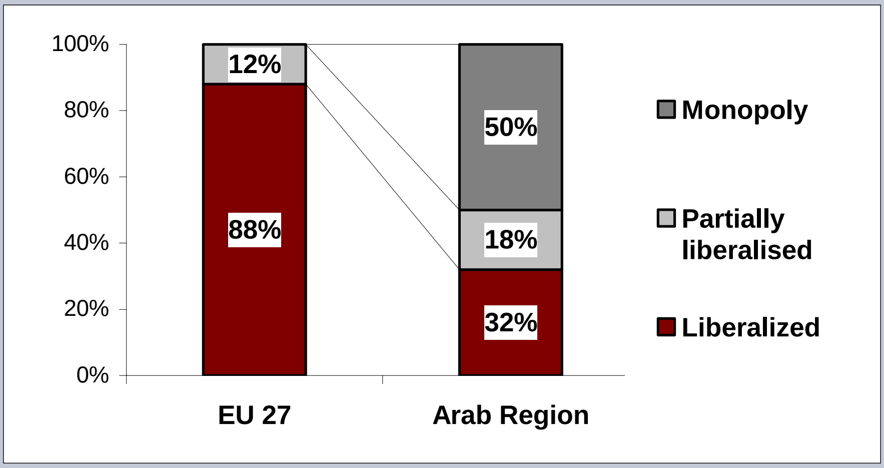
Note: * calculated as an annual average of various retail charges, applied by a visited operator, calculated as a total revenue divided by total minutes.

** additional margin for the first, second and subsequent years respectively.

Source: AREGNET (2007). Roaming regulation in the Arab countries.

The important issue is that the proposed regulation links international roaming prices with retail prices of regular international calls. This model, of course, takes into account regional specifics, such as non-liberalized international gateways (there are a significant number of Arab States that have not yet liberalized their international gateways – see Figure 4). The proposed regulation is simple, clear and flexible enough. In the European case, moving away from a "formula based" to a given price cap has introduced simplicity and more clarity for end users, but at the same time regulators have lost some flexibility to change international roaming prices together with MTR changes without reviewing the regulation at the EU level.

Figure 4: Liberalization of international gateways (percentage of countries in the region, 2007)



Source: *ATKearney (2007). Comments on proposed voice roaming regulation in the Arab countries.*

However, AREGNET[50] identifies some inherent constraints, which are important to take into account:

- "The model links wholesale charges applicable to foreign operators with local retail charges. Therefore application of this model would punish operators of countries where market liberalisation and tariff rebalancing have progressed further as proceeds of local competition and sector reform would be automatically enjoyed by foreign operators without the reciprocal benefit. This would to some extent be mitigated by retail price regulation as such regulation would force pass-through of savings in wholesale costs and thereby would benefit visited operators because of increased volumes of traffic.
- The model is based on costs to the extent only to which retail charges for international calls are close to costs. This may not be the case in some countries because of the stage of market liberalisation and sector reform.
- The model is not easy to apply. Agreement would be necessary, which prices should be taken as a reference when applying price-caps (lowest, highest, some form of average), and subsequent enforcement would be needed. It would not be easy for operators to verify if their roaming partners adhere to the regulation as they may not necessarily have the information necessary.
- The model is not applied in other regions that regulate roaming (namely – the EU). Therefore it could be not easy to agree on inter-regional regulation, if it considered desired at a later stage. "

4.2.2 Regulatory intervention in other regions

In September 2005 the Australian Competition & Consumer Commission (ACCC) published its report on the provision of international inter-carrier roaming services. Although ACCC found wholesale and retail charges for roaming services to be too high and consumers to lack information on the offerings, ACCC did not decide to take any significant regulatory action other than further monitoring of prices, liaising with other overseas regulatory authorities and, possibly, contributing to consumer awareness initiatives.

On the other hand, outside Europe, some believe that there is little prospect of international roaming charge regulation. Sometimes national regulators have no incentive to force their own operators to cut prices if they cannot force reciprocity from operators in other countries.

Furthermore, regulation of international roaming is more complicated than regulation of other telecom services basically because regulation of international roaming is difficult to implement at the national level as operators from more than one country are involved. When a consumer travels abroad, it is another "foreign" operator that provides facilities for making and receiving calls, and bills the home operator for this wholesale service. The price of these wholesale services has been traditionally high, with correspondingly high retail charges being passed on to the customer in the bills received from his or her own operator. But the regulator of country A has no legitimate power to control prices of an operator operating in country B. This is why coordination is essential.

4.2.3 Self-regulatory practice: market developments

While regulation was the answer to the international mobile roaming issue in the EU, self-regulatory practices may also provide an alternative.

One of the features of the international mobile roaming market is that mobile operators rarely limit themselves to one partner per country and usually aim to sign roaming agreements with virtually every mobile operator. This is not only because they want to offer their subscribers better choice and coverage within visited countries, but mainly to benefit from the reciprocity of roaming arrangements and the possibility to serve as many inbound users as possible. Furthermore, as some mobile operators are active in several countries, e.g., through ownership of mobile operators, the development of alliances and groups allow their members to enjoy lower wholesale charges.

The recent rise of alliances and groups is evidenced by developments in Europe, where groups (e.g., Vodafone, Orange, T-Mobile, TeliaSonera, Tele2) and alliances between network operators (Freemove[51] and Starmap[52]) have emerged. Similar consolidation is being evidenced in the Arab States by regional expansion of several operators (including Zain/MTC, Orascom, Qtel, Etisalat, Batelco, and MTN). The formation of alliances and groups bring some noticeable developments in the area of international roaming:

- Decrease in wholesale roaming tariffs[53]. Before the EU Regulation took place, Freemove alliance, which joins four mobile operators (Orange, TIM, T-Mobile and TeliaSonera) operating in 26 countries across Europe, the United States and Brazil and member operations extending to 47 countries worldwide[54], decreased international wholesale rates to 72 eurocents per minute in January 2006 and to 45 eurocents per minute from 1 October 2006. Freemove also planned to decrease these rates further to 36 eurocents per minute from 1 October 2007. Vodafone similarly decreased wholesale roaming tariffs to 70 eurocents per minute in May 2006 and 45 eurocents per minute in Q3 2006. One of the incentives for these developments could also have been the threat of regulation from the European Commission.
- Merger of national networks/markets to broader "one network" areas. In September 2006 Celtel, a subsidiary of Zain/MTC, abolished roaming charges in East Africa between Kenya, Tanzania and Uganda. Afterwards it has expanded its roaming service offer to 12 African countries, enabling around half of all African mobile phone subscribers to communicate across national borders without incurring extra costs. Celtel's roaming service is now available in Nigeria, Niger, Chad, Sudan, Burkina Faso and Malawi, as well as the Republic of Congo, Democratic Republic of Congo, Gabon, Kenya, Tanzania and Uganda. Launched a little over a year ago, Celtel's roaming service will extend services to a population of nearly 400 million people, living in an area twice as large as Western Europe[55]. In this "single network" area customers can make calls at local rates and receive incoming calls free of charge without any prior registration or fee.

  In a competitive move, Safaricom Kenya immediately entered into an agreement with Vodacom Tanzania and MTN Uganda to offer similar roaming services at domestic rates. Later on the MTN Rwanda, UCOM (Burundi) joined the alliance, called KAMA KAWAIDA[56].

  Zain/MTC has also recently announced similar plans for Saudi Arabia, Bahrain, Jordan and Iraq. Is it expected that Zain/MTC One Network will be extended to these countries in the first half of 2008[57]. Similar initiatives are also being implemented by other operators.

Hutchison Whampoa, trading as 3, has abolished roaming charges for calls received by its customers on its own networks in: Australia, Austria, Denmark, Hong Kong, Italy, the Republic of Ireland, Sweden and the United Kingdom[58]. TeliaSonera (Omnitel, LMT and EMT) and Tele2 operations in the Eastern European Baltic States also offer services for customers roaming in the respective countries, without charges for incoming calls and at reduced charges for outgoing ones[59].

- The Telecel networks, represented in five countries in West Africa (Benin, Burkina Faso, Cote d'Ivoire, Niger and Togo) in addition to Gabon, offer their customers a roaming service called "@Sim". The subscription involves two or more SIM cards, one for the home network and the others for the local networks in the countries to be visited[60].
- Given the heavy volume of travel between Hong Kong, SAR, China and the mainland in China, a number of solutions to roaming charges have been developed. One of the options – one SIM card with two numbers, or even three, for the mainland, Hong Kong, China and Macau, China[61].
- Conexus Mobile Alliance, created in April 2006, has nine members in Asia: Far EasTone Telecommunications Co., Ltd. (Taiwan); Bharat Sanchar Nigam Limited (India), Mahanagar Telephone Nigam Limited (India); Hutchison Telecommunications (Hong Kong) Limited (Hong Kong and Macau); PT Indosat Tbk (Indonesia); KT Freetel Co., Ltd. (South Korea); NTT DoCoMo, Inc. (Japan); StarHub Ltd. (Singapore) and Smart Communications, Inc. (Philippines). It was formed to enhance members' competitiveness in international roaming services, especially for Broadband wireless services in their own countries/regions and across Asia-Pacific[62]. In the beginning of 2008, the member operators jointly rolled out the first pay-per-day data roaming flat rate plan in Asia. Subscription is not required in most of the member networks. Members' customers will be automatically charged based on the data roaming flat rate tariff plan while roaming on to members' networks[63].

Several other market developments, indicating increased competition in international roaming market have been observed:

- Increased marketing activities targeting inbound customers: advertisement in airports, tourists' areas.
- Emergence of some regional/global offerings specifically targeting the market of roamers. Examples of innovative offerings are services of UK-based Cherry mobile[64] and Oneroam[65] as well as of US-based OneSIMcard[66]. These companies aim to offer local-type (without charges for incoming calls and lower charges for outgoing ones) services with the same SIM-card, which may be used in many countries. They base their offerings on specific agreements with local mobile network operators, including mobile virtual network operator type agreements.

Some recent technological developments will also enable operators of visited countries to target frequent roamers. An example of such a development is the possibility to assign a local number of a visited country to a foreign customer using a single SIM card of his home network operator[67]. Operators of the Arab region are starting to provide this kind of services. An example is a recent announcement by Saudi Telecom[68] that visitors to Saudi Arabia from all over the world will be able to get a local Saudi Arabian telephone number using the same SIM card of their home operator. After obtaining the number they will be able to use local Saudi Telecom's "Al Jawal" services on a pre-paid basis.

There are certain industry led developments fostering transparency of roaming tariffs as well. Following the ARAGNET study, the GSM Arab World launched a website that allows comparison of roaming tariffs[69]. This website replicates one designed for the European region. Some industry associations[70] also promote voluntary codes of conduct for information on international retail prices. The operators who sign up for the code of conduct commit themselves to provide information on roaming via:

- A customer service number of the home operator;

- An Internet site of the home operator;
- SMS (the minimum requirement is to provide a link to a website with roaming information or a phone number of a customer service).
- The code of conduct also encourages operators to provide information on roaming via: retail outlets; printed material; information at airports, borders and etc.

Box 2: Cheaper roaming: one phone but two numbers

There are two ways to avoid using a second phone while keeping two numbers. The first option is to buy a small device, called a dual SIM card adapter. Once inserted in the phone, it allows the handset to carry two SIM cards - and therefore two phone numbers - at the same time. The other option is to have a second number added to an existing SIM card through the subscriber's carrier.

One reason the dual SIM card device is not widespread is that mobile phone operators are reluctant to share their clients with competitors. Giving customers the possibility to easily use two SIM cards opens the opportunity for them to have cards from different companies.

Even with two SIM cards, though, a user cannot simultaneously receive phone calls coming in to the two different phone numbers. To switch between the phone numbers, in most cases, the phone has to be shut off and turned back on. That makes the dual-SIM-card phone potentially appealing for somebody who travels in two countries and has local phone numbers in each place to save on roaming charges.

There are some phones that leave the factory ready to take two SIM cards, although they are not big sellers.

Source: *International Herald Tribune, 2005*[71]

5 TRANSPARENCY ISSUE

It is necessary to recognize the important role that transparency can play in raising consumer awareness on the differences between operator's mobile roaming rates. One of the first initiatives of the EC to improve the situation in international roaming market was to encourage greater transparency in retail roaming prices. The website on roaming prices comparison across the EU was launched in 2005. Although afterwards the EC realized that transparency measures were not enough, all the parties – the EU, regulators, and mobile operators and consumers associations - have understood the significance of transparency. Surveys[72] conducted before the EU roaming regulation indicated that more than 40 per cent of European users did not have a clear idea of the cost of calls abroad. This means, that if price transparency is weak, roaming customers do not have full information about the range of roaming tariffs available in different countries on different networks, therefore they are not able to make sound decisions on consumption, and where to use the service or not.

A range of initiatives has been taken by different stakeholders:

1. The EC launched the website on roaming prices;
2. The ERG formed a project team to analyze roaming prices transparency in the EU and to suggest possible measures, if necessary.
3. First GSM Europe, then GSM Arab World, both branches of the GSM Association, developed a voluntary code of conduct for operators, the goal of which is to provide better information to consumers.
4. Two websites that allow comparison of roaming tariffs were launched by industry association – one for the European region and another for Arab region. AREGNET has recommended that information be published in the Arabic language to make it more user-friendly.
5. Finally, the EU regulation creates a system to enhance transparency of retail roaming charges. Article 6 of the EU regulation states: "*To alert a roaming customer to the fact that he will be subject to roaming charges when making or receiving a call, each home*

provider shall, except when the customer has notified his home provider that he does not require this service, provide the customer, automatically by means of a Message Service, without undue delay and free of charge, when he enters a Member State other than that of his home network, with basic personalised pricing information on the roaming charges (including VAT) that apply to the making and receiving of calls by that customer in the visited Member State." In addition consumers have the right to request and receive more detailed information free of charge.

However, each transparency measure has its advantages and disadvantages. For some examples see Table 11.

Table 11: Transparency measures

Measure	Advantages and disadvantages
National or international website	**Advantages:** • Would provide a one-stop shop for information and comparisons of retail roaming prices for operators. • Consumers could consult the site anywhere where Internet access available. **Disadvantages:** • Might be difficult to find appropriate methodology for the comparison of numerous combinations of different and complex offers. • Legal uncertainty- who is responsible for the accuracy of the information.
To inform customers by SMS	**Advantages:** • Would provide a one-stop shop for information and comparisons of retail roaming prices for operators. **Disadvantages:** • Might be difficult to find appropriate methodology for the comparison of numerous combinations of different and complex offers. • Legal uncertainty - who is responsible for the accuracy of the information.
Information in paper form	**Advantages:** • Easy to implement. • Easy to access customers in interest (airports, country borders) **Disadvantages**: • Information might be lost. • Operators may have to meet additional costs for producing, updating and distributing information.

Source: ERG (2005). ERG Project Team on International Roaming Retail tariff Transparency.

6 LEGAL ENFORCEMENT – COORDINATION AND COOPERATION BETWEEN REGULATORS

The EU case is unique because of the institutional framework that allows directly applicable and enforceable legislation for the whole EU. Regulation of roaming is essentially cross-border by nature. Wholesale regulation in one single country benefits operators and consumers in another country, but provides no benefits to either local consumers or market players. Therefore reciprocity is a must. This is evidenced by the EU practice, where a mere inclusion of wholesale markets of international roaming into the Recommendation of the European Commission[73] as the market that national regulatory authorities had to analyze did not produce results. The change was effectuated with a central compulsory legal instrument – namely the Regulation – only.

Therefore for other region organizations or economic groups it is important to coordinate and adopt a common regulation that would be made compulsory and enforceable with, preferably, the possibility of direct enforceability by market players concerned via both administrative and civil law measures. Bur first it is a question of political will.

Possible instruments for such implementation are:

- International (regional) treaties; or
- Agreements between regulators.

The appropriate option should be chosen after a careful analysis of legal systems and different powers of regulators concerned to enter into mutually binding agreements and to make provisions of such agreements the binding and enforceable part of the local legal systems.

The other issue to consider is whether an agreement should:

- Cover all the countries of the region from the start. It is a theoretically preferable option as it would rapidly provide all customers in the region with benefits of more affordable international mobile roaming services. However as different countries could have different regulatory priorities and/or could be at different stages of market development, it could be unrealistic to expect that all countries would commit to a common regulation proposed from the start; or
- Start between a smaller group of countries, and apply the agreement among interested countries only, while being open to other countries to join later. Any country would be free to join the agreement at any stage. Such an approach would give an opportunity for some countries to ensure lower international roaming prices for their consumers sooner and for other countries to wait for the results of regulation and then decide if they want to join.

The second approach seems to be more realistic. As a first step, the initial signatories would also have to identify who would be responsible for administering the agreement. Then it would also be important to publicize the agreement and its outcomes via, *inter alia*, special website with links from participating countries' websites.

From a consumers' perspective it seems to be in a country's or region's interest to enter into a bilateral agreement with the EU on international roaming[74]. While similar agreements on other services such as land and air transportation between the EU and non – EU countries already exist, a bilateral agreement on international roaming may be more difficult to implement because of the differences that exist between regulatory frameworks.

During the EU consultation, questions were raised by some EU operators regarding the compatibility of the regulation of wholesale international roaming tariffs with Article XVII of the GATS and paragraph 5 of the GATS Annex on Telecommunications. Some EU operators also expressed concern that as a result of the GATS obligations they would be required to offer wholesale roaming tariffs to non EC-based mobile operators at a level not exceeding the regulated level, while at the same time such operators could charge EC-based operators higher, unregulated, wholesale prices. In response, the EC[75] explained that pursuant to Article XVII of the GATS national treatment has to be accorded to like services and service suppliers. Paragraph 5 of the GATS Annex on Telecommunications contains a further non-discrimination obligation which requires the application of terms and conditions no less favorable than those accorded to any other user of like public telecommunications transport networks or services under like circumstances.

7 CONCLUSIONS

International mobile roaming is becoming an increasingly important issue on the international regulatory and policy agenda. There are several reasons for the growing importance of international roaming, as highlighted in this paper. This is not only because of higher demand for roaming services, as mobile penetration is growing across the world; nor is it only because international mobile roaming charges are an important cost factor for businesses across the world. International roaming should be viewed in a much wider context as a tool for forging regional cohesion. Therefore, for regional economic groups seeking closer cohesion and integration, international mobile roaming is one of the barriers that can be removed. This should be understood not only by regulators and policy makers, but also by operators. As long as industry, through self-regulatory measures, fails to deliver sufficient results, regulators are likely to intervene to try to improve the situation.

Although the history and practice of international mobile roaming regulation is very recent, it has already taught all stakeholders one lesson: whichever approach to international mobile roaming rate regulation is chosen, the success and final result depends largely on how closely different stakeholders cooperate and how openly they discuss and debate the issues. The outcome of the EU regulatory debates was a compromise between all stakeholders. The Arab region is currently in the middle of this process, and is working to allow the voices of all parties concerned to be heard. Whichever regions move to initiate a similar process should be ready to discuss – both to talk and to listen.

Currently, international mobile roaming services are usually vertically integrated, meaning that both network and service operations are carried out by the same operator, thus giving greater control to mobile operators over their customers. Upcoming next-generation networks and the move to mobile IP networks could change the status quo, making the roaming problem less relevant. Today, however, international roaming rates remain highly relevant, requiring cooperation and dialogue among all stakeholders.

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