



# **IMT-2000 Licensing**

## **Principles and Methods**

*Regional Workshop for the Arab Region on Guidelines on the Smooth Transition of Existing Mobile Networks to IMT-2000 for Developing Countries*

**Damascus 13-15 June 2005**

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## **IMT-2000 Licensing Principles and Methods**

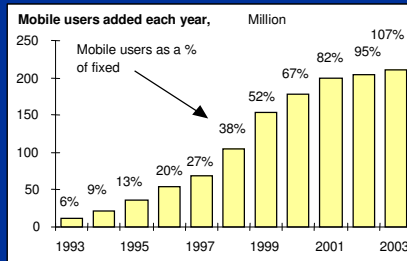
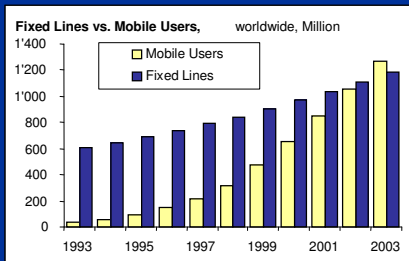
### ***In this Presentation:***

- **The Growth of Mobile Cellular**
- **IMT-200 Spectrum and Licensing Considerations**
- **Principles of licensing procedures and methods**
  - ◆ **Principles of licensing procedures**
  - ◆ **Licensing methods**
- **Licensing Condition - Obligations of licensees**



# The growth of mobile cellular services

1993-1999 actual, with forecasts to 2003.

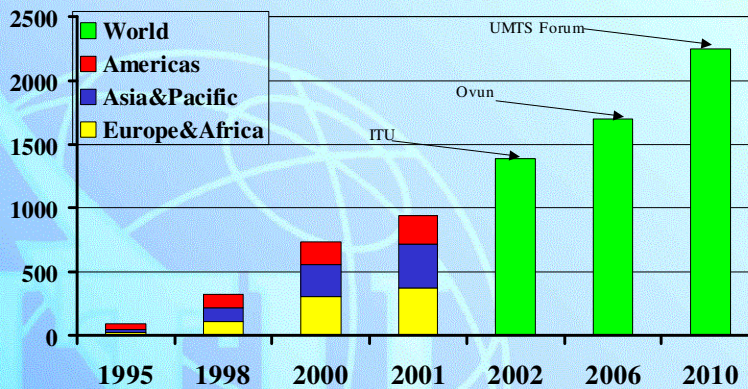


Source: ITU World Telecommunication Indicators Database and ITU forecasts in Trends in Telecommunications Reform, 2000 -2001: Interconnection Regulation .

## Trends – Mobile Growth (worldwide)



Cellular Subscribers (millions)

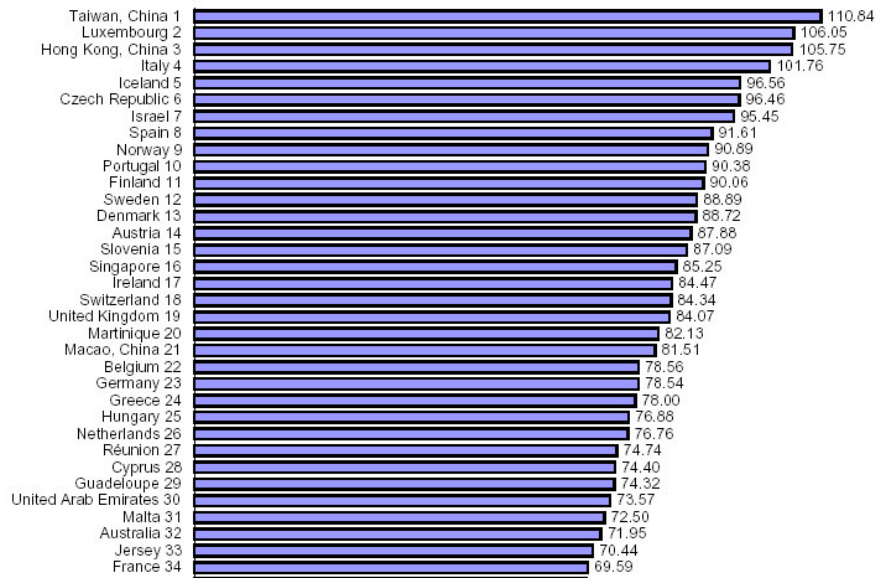


Source: ITU Indicators

Number of mobile subscribers already greater than fixed



### Mobile Subscribers per 100 inhabitants, top75, 2003

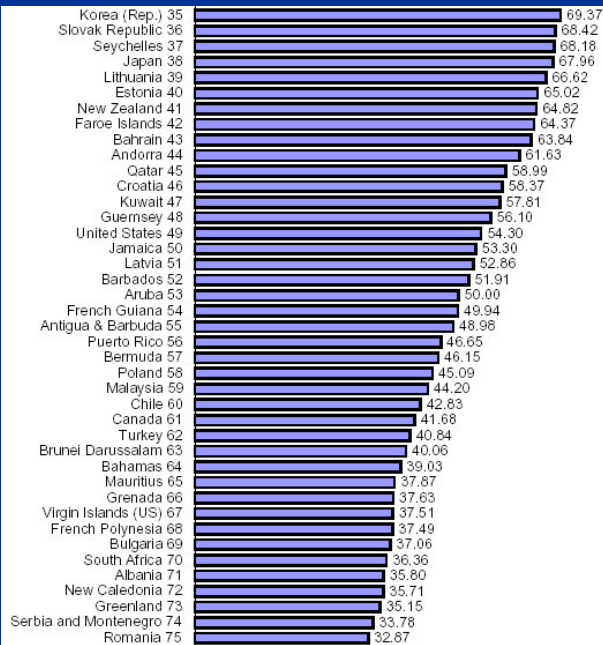


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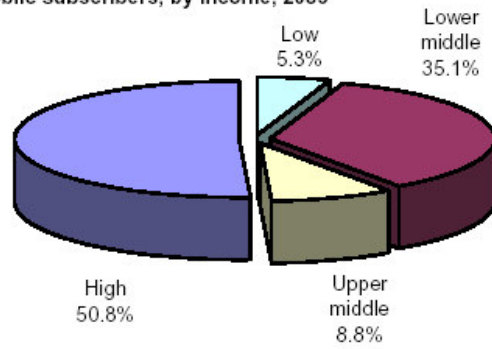


### Mobile Subscribers per 100 inhabitants, top75, 2003

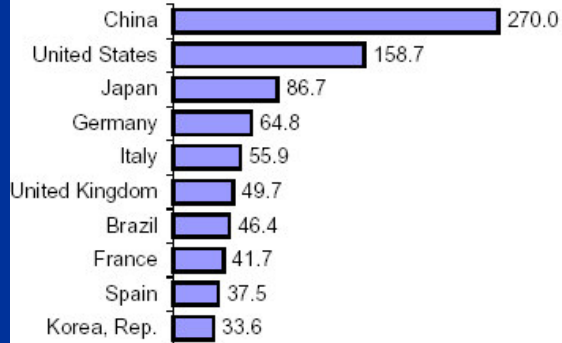




Mobile subscribers, by income, 2003



Total mobile subscribers, top 10, 2003, millions





**Arab States: Mobile Cellular subscribers** (source ITU)

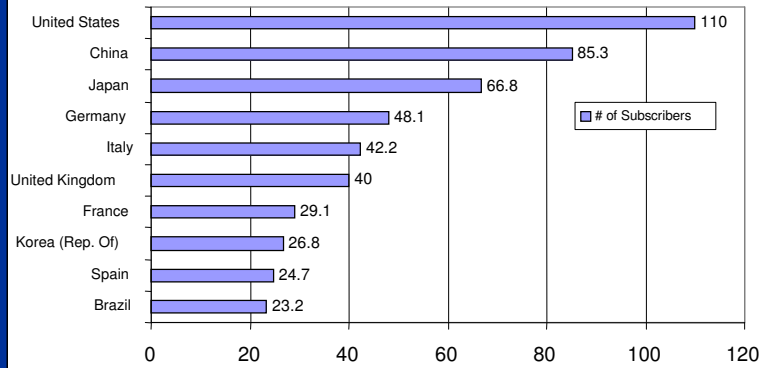
		1998	2003	1998-03	Per 100	%	% of total
				(%)	subscribers	fixed	subscribers
1	Algeria	18.0	1'441.4	140.3	4.54	...	39.6
2	Bahrain	92.1	443.1	36.9	63.84	100.0	70.5
3	Comoros	-	2.0	-	0.25	...	13.1
4	Djibout	0.2	23.0	153.4	3.44	100.0	69.3
5	Egypt	90.8	5'797.5	129.6	8.45	100.0	39.9
6	Iraq	-	80.0	-	0.32	...	10.6
7	Jordan	82.4	1'325.3	74.3	24.19	100.0	68.0
8	Kuwait	250.0	1'420.0	41.5	57.16	100.0	74.5
9	Lebanon	505.3	820.0	10.2	23.43	...	53.9
10	Libya	20.0	127.0	44.7	2.30	...	14.5
11	Mauritania	-	350.9	-	12.75	...	90.2
12	Morocco	116.6	7'359.9	129.1	24.43	100.0	85.8
13	Oman	103.0	593.5	41.9	22.83	100.0	72.1
14	Palestine	100.0	480.0	36.9	13.27	...	60.3
15	Qatar	65.8	376.5	41.8	53.31	100.0	67.1
16	Saudi Arabia	627.3	7'238.2	63.1	32.11	100.0	67.4
17	Somali	-	500.0	-	4.17	...	86.2
18	Sudan	8.6	650.0	137.5	1.95	...	41.9
19	Syria	-	1'185.0	-	6.75	100.0	36.1
20	Tunisia	39.0	1'947.8	118.7	19.69	...	62.6
21	Uni. Arab Em.	493.3	2'972.3	43.2	73.57	100.0	72.4
22	Yemen	16.1	700.0	112.5	3.47	...	56.4
	<b>Arab State</b>	<b>2'628.5</b>	<b>35'833.4</b>	<b>68.6</b>	<b>14.80</b>	<b>80.2</b>	<b>58.1</b>

Note: Figures in italics are estimates or refer to years other than those specified.

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**Figure 1: Top Mobile Economies (2000, millions)**

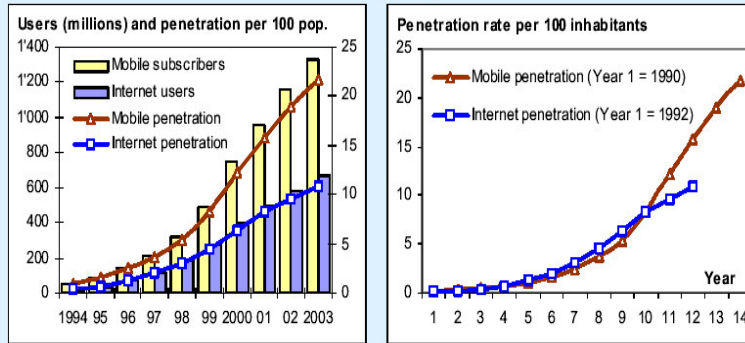


Source: International Telecommunication Union

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**Figure 1.2: The stakes in play: The mobile and Internet sectors worldwide**  
 Mobile and Internet users, worldwide, 1994-2003, and staggered penetration rates since 1990/92

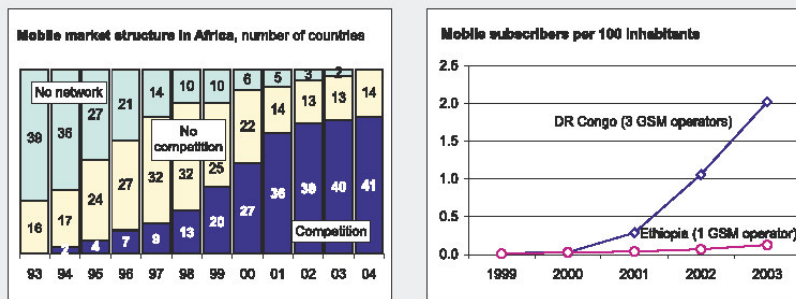


Source: ITU World Telecommunication Indicators Database



## Regulatory aspects to increase the mobile penetration

**Figure 4.1: Mobile competition**  
 Distribution of countries in Africa by whether no mobile network, monopoly mobile market or competitive mobile market, 1993-2004 (left) and mobile subscribers per 100 inhabitants in DR Congo and Ethiopia, 1999-2003 (right)



Source: ITU.



## IMT-2000 spectrum and licensing considerations

### Ministry of Communications/National Regulatory Authority

- Open multi-operator multi-service provider environment
- Licensing regimes enable managed development of the sector
- Provide for access to scarce resources (**Individual Licence**)
  - ◆ Spectrum
  - ◆ Numbering
  - ◆ Access to land
- Impose rights and obligations
- Protect/promote consumer interests



## IMT-2000 spectrum and licensing considerations

### *Individual Licence*

An authorisation which is granted by the **Ministry of Communications/National Regulatory Authority** and which gives an undertaking specific rights and obligations, where the undertaking is **not entitled to exercise the rights concerned** until it has received the decision is taken by the **Ministry of Communications/National Regulatory Authority**



## IMT-2000 spectrum and licensing considerations

- Radio spectrum, which is a scarce, finite and valuable resource, should be allocated in a way that achieves maximum efficiency
- Allocation of spectrum, especially for public mobile networks, raises many economic issues
- Today licensing requires:
  - Technical knowledge (standards + frequencies)
  - Knowledge of local market environment
  - Estimation of the future demand for services
- More than 150 IMT-2000 licences have so far been awarded globally

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## IMT-2000 spectrum and licensing considerations

### *Key questions before licensing*

- How to contribute optimally to the development?
- How to act so that current decisions will meet the requirements when a commercial service of 3G starts?
- What decisions are needed now and what could be decided later?
- How will markets and technology develop?
- Will the regulative framework change before the networks are implemented?

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## IMT-2000 spectrum and licensing considerations

### *Spectrum price*

- Spectrum must be available at the right price
- What would be the right market value and the right price?
- The right price can change between the licensing process and the start of operation
- Large up-front payments for spectrum will adversely affect the growth of 3G services
- The end user will always pay for the spectrum in the end
- The number of licenses awarded has to be determined taking into account the available spectrum and competition issues
- The number of licenses to be awarded is an element of competition policy and can critically determine the success or failure of the 3G regulatory framework and of 3G service provision in general.
- The ITU has nominated the bands to be considered for the implementation of IMT-2000. Within these bands, each national government selects the amount of spectrum to be made available for 3G services, taking into account competing demands and uses for the spectrum.



## IMT-2000 spectrum and licensing considerations

### *Spectrum Licence fee*

1. Fees can be set by the licensing Authority  
(Administrative Fee)
  - Fixed fee – (fee may be cost plus)
2. Fees can be set by the market
  - Competitive Offer (Beauty Contest )
  - Competitive Bid (Auction)



## IMT-2000 spectrum and licensing considerations

### *Consideration for setting Licence Fees*

- Economic conditions
- Perceived value of the market
- Comparison with fees for other utility licences
- Benchmarking with similar countries
- Extent to which scarce resources are involved
- Amount of spectrum to be used
- Geographical location
- Roll-out costs
- End-user prices
- Cost of issuing licence – including the process

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## IMT-2000 Licensing

“Principles of licensing procedures and methods”



## Principles of licensing procedures

- ◆ The public interest
- ◆ Transparency
- ◆ Public participation
- ◆ Fairness
- ◆ Non-discrimination
- ◆ Efficiency



## Principles of licensing procedures

### *Public interest*

- ◆ criteria for licensing should be based on the public interest (however defined) and not on the interests of any one or more of the parties (**published in official government documents as well as in electronic and other media, such as website**)
- ◆ criteria should be as objective as possible



## Principles of licensing procedures

### *Transparency (re criteria and process)*

1. criteria must be published in enough detail to be absolutely clear (in official government documents as well as in electronic and other media, such as website)
2. the entire process should be transparent (no ex parte contact with applicants)



## Principles of licensing procedures

### *Public involvement*

1. the public should be invited to participate in a meaningful way in the process
2. Invitations should be transparent, for example, published in electronic and/or other media freely available to the public



## Principles of licensing procedures

### *Fairness*

- ◆ the process should be fair to all parties involved or interested, including the public
- ◆ all interested parties must have an adequate opportunity to be heard
- ◆ reasons must be given for decisions - decisions must be rational



## Principles of licensing procedures

### *Efficient*

- the process must not impose unnecessary burdens on either the applicants or the independent regulator



## Principles of licensing procedures

### *Non-discrimination*

- ◆ the criteria and process should be non-discriminatory
- ◆ exceptions for appropriate set-asides for example, for nationals

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## Principles of licensing procedures

### *Principles - where to find them*

- Telecommunications legislation
- Administrative procedures legislation or a constitutional right to fair administrative procedures
- Regulations (subordinate legislation)

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## Licensing methods

- There are **many methods** of spectrum licensing that have been used both for first and second generation mobile licenses, as well as for IMT-2000 licenses.
- Most countries **have required special licenses** in order for operators to provide IMT-2000 services, while other countries have taken a **more flexible licensing approach and allow operators to use current spectrum for IMT-2000 services and/or license spectrum use on a more generic basis**, such as for “advanced wireless services.”
- Some regulators **allow first and second generation systems to migrate to IMT-2000 in their current bands** and do not require further authorization to do so

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## Licensing Methods

- **Non-competing application procedures**
  - ◆ **First-Come, First-Served**
- **Competing application procedures**
  - ◆ Comparative processes (*beauty contest*)
  - ◆ **Auctions**
  - ◆ Lotteries
  - ◆ Hybrid

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## Licensing Methods: Non-competing applications

### *First-Come, First-Served*

- When spectrum **was not a scarce resource**, regulators used a first-come, first-served approach to licensing spectrum.
- Royalty payments (e.g.):
  - Fixed fee for first five years,
  - thereafter 5% of the annual 3G revenue
- As spectrum **has become more valuable**, the regulator is **unlikely** going to assign frequencies on a first-come, first-served basis any more, except in the most remote areas



## Licensing Methods: Non-competing applications

### *First-Come, First-Served*

#### **Advantages First Come, First Served**

- **Speed**
- **Inexpensive**

#### **Disadvantages First Come, First Served**

- License may not end up in the hands of an entity that values it the most and can bring greatest value to the economy.
- The value of the license is **not taken into account**.





## Licensing Methods: Competing application procedures

- Comparative applications (**Beauty Contest**)
- **Auctions**
- Lotteries
- Hybrid



## Competing application procedures: Comparative applications

- In a “**beauty contest**” (also referred as “beauty parade” or “comparative hearing/parade”), the Regulator/Ministry selects/scores the winning applicant using comparative criteria (**scoring Matrix, annex 2**).
- Used for 2G in many countries and it has also been used in some countries to issue licenses for IMT-2000.
- Criteria to compare the prospective license applications are established and can include:
  - **the technical and financial stability of the applicants,**
  - **the technical characteristics of the system being deployed,**
  - **the coverage area being proposed,**
  - **the schedule for build-out”(roll out).**



## Competing application procedures: Comparative applications

### *Draft procedure for comparative applications (1)*

1. Proposed selection criteria and process chosen by the independent regulator
2. Public given an opportunity to comment on proposals (e.g. three months)
3. Final selection criteria (Tender Document) and process (Scheduling table) made public by the independent regulator
4. Applications are called for



## Competing application procedures: Comparative applications

### *Draft procedure for comparative applications (2)*

5. Applications are submitted (e.g. six months)
6. Public given an opportunity to comment on applications (e.g. three months)
7. Applicants given an opportunity to reply to public comment (at least three months)
8. A hearing may be held where the regulator can question the applicants and/or the public can question the applicants



## Competing application procedures: Comparative applications

### *Draft procedure for comparative process (3)*

9. The independent regulator may, at any time, call for additional information from applicants
10. The independent regulator considers all information and makes a decision (Evaluation Phase) on who should be awarded the license (with reasons given)
11. There could be an appeal process built in here
12. The license is awarded



## Competing application procedures: Comparative applications

### *Advantages Beauty Contests*

- if done properly, the BEST applicant will be awarded the license
- Allows the regulator to determine the contender that will best serve the public interest.
- Final costs for operators are more easily predicted than other options such as auctions. The money to the investment to develop the networks and services for the user benefits.
- Long term benefit for the economy/society than short term help to the state budget
- More freedom for the regulator to amend the regulation if needed (national roaming, convergence, new market needs etc.)
- Allows for equity considerations, such as minority ownership, small business ownership, etc.



## Competing application procedures: Competitive applications

### Disadvantages Beauty Contests

- Can be a lengthy process, particularly if the license is valuable. Applicants are often willing to exhaust all administration and litigation options. Costly in terms of money and other resources, a subjective process and likely to be reviewed in the courts, requires an experienced and strong regulator to consider applications competently and without undue influence by any of the interested parties
- Can get expensive for the applicants if they are willing to spend large sums of money to succeed in the beauty contest process.
- Provides no method for deciding between two applicants that are essentially equal. The regulator may ultimately have to arbitrarily award the license.
- Government is responsible for choosing between alternative business plans stretching well into the future, and relating to new products and services that have not yet been developed.
- Need to be carefully structured to be fully transparent. Doubts over transparency of beauty contest process can lead to suspicions and dissatisfaction with the outcome.



## Competing application procedures: Auctions

- Auctions award the licenses based upon the bidders' willingness to pay. Since the 1990s when spectrum auctions first began to be used for awarding spectrum licenses, billions of dollars have been raised in spectrum auctions and a fierce debate has arisen concerning the efficiency, competitive impact and social implications of this form of allocating spectrum.
- There are a variety of methodologies that have been used for spectrum auctions, including continuous, simultaneous multiple-round, and package.
- Preliminary minimum criteria re technical and financial ability (or other such criteria such as requirements for local participation or empowerment/affirmative action participation) applied to obtain entry as a bidder (pre-qualification phase)



## Competing application procedures: Auctions

### Advantages Auctions

- The costs to government are less than with comparative application processes and the process is not as lengthy in time
- License goes to the entity that values it the most. Auctions promote economic efficiency, one of the goals of spectrum management. Winning bids should come from the companies that can find ways of maximizing the stream of future benefits.
- Spectrum is a public resource and therefore the profits benefit the citizens. The proceeds of the auction go to the government for national purposes (results in taxpayer sharing of national spectrum resource)
- Auctions can provide information about the economic value of spectrum. For instance, if applicants are willing to pay a high price to be able to provide one service, but will pay a very low price for a different service, then the regulator can determine which service has greater economic benefit and, therefore, can determine where it needs to focus its future spectrum management efforts.



## Competing application procedures: Auctions

### Disadvantages Auctions (1)

- Auctions may lead to increased concentration in the industry. The regulator can consider placing spectrum caps to limit the amount of spectrum that one entity can hold, or limit eligibility to participate to non-incumbents. In addition, a nation can address monopoly concerns through its antitrust laws or competition policies.
- Auctions may ignore non-financial objectives that are in the public interest, such as equity considerations. The auction design can support those objectives by including strategies such as set-asides and providing bidding credits for certain groups that commit to addressing certain public interest factors.
- There may be some incentive for the government to act like any monopoly by restricting output and raising the price. In other words, if the government wanted to maximize the revenues to the treasury, it could withhold spectrum.



## Competing application procedures: Auctions

### Disadvantages Auctions (2)

- Auctions may result in speculatively high bids for licenses for services that are not commercial at the time of the auction. Auctions can also be affected by hype and other non-economic forces.
- Full information on IMT-2000 market characteristics is not always available, leaving some or all bidders without adequate information on market conditions, the regulatory environment, demand characteristics and the likely pricing structures.
- Likelihood of winner's curse that results in high prices for the license and leads to decreased investment capacity for operators and high end-user prices
- often money that should be used to build a network and provide services is spent buying a license in the first place and thus consumers in the end are disadvantaged with higher prices, and if there is not a clear process and consistent and fair application of the process, then it is likely to be challenged in the courts



## Competing application procedures: Lotteries

- Lotteries - preliminary minimum criteria re technical and financial ability (or other such criteria such as requirements for local participation or empowerment/affirmative action participation) applied to obtain entry as a lottery player to participate to the random selection



## Competing application procedures: Lotteries

### Advantages Lotteries

- the costs are less than with comparative processes and the process is not as lengthy in time
- Provides a mechanism for selecting from substantially equal applications.



## Competing application procedures: Lotteries

### Disadvantages Lotteries

- The license may be awarded to an entity that is not qualified to build and operate the system. Any person may be able to participate in the lottery if no pre-qualification requirements are set. The regulator can establish criteria for participation in the lottery. However, this can be legally challenged and make the lottery process a lengthy one.
- Speculators will participate in the lottery, with the purpose of reselling the license and reaping huge windfall profits. Reselling the license is known as "flipping it." So rather than the public getting the benefit of the revenues, the lottery winner will realize the revenues from the sale of licenses they got for minimal investment.
- If an unqualified party wins the lottery, the regulator has the challenge of deciding whether to let them sell it or not.
- winners often use the process to buy a "lottery ticket" and never intend to operate a network or provide a service, but simply want to resell a valuable asset (the license) for profit, thus you are not likely to get the best applicant



## Competing application procedures: Hybrid

- A number of countries, including Austria, Italy and Hong Kong, have adopted a “hybrid” approach to IMT-2000 license allocation.
- Tenderers have to pre-qualify in terms of criteria similar to those established for beauty contests to bid.
- Licenses are then allocated on the basis of an auction.
- Advantages and disadvantages of a hybrid approach are themselves a combination of the advantages and disadvantages of beauty contests and auctions.

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## Competing application procedures: Hybrid

### *Advantages Hybrid*

- Ensures that contenders have appropriate resources and business plans to serve the public interest. Can require that licensees meet specific policy goals.
- License goes to the qualified entity that values it the most. Winning bids should come from the qualified companies that can find ways of maximizing the stream of future benefits.
- Spectrum is a public resource and therefore the profits benefit the citizens. The proceeds of the auction go to the government for national purposes.
- Allows for equity considerations, such as minority ownership, small business ownership, etc.

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## Competing application procedures: Hybrid

### Disadvantages Hybrid (1)

- Auctions may lead to increased concentration in the industry. The regulator can consider placing spectrum caps to limit the amount of spectrum that one entity can hold. In addition, a nation can address monopoly concerns through its antitrust laws or competition policies.
- Can be time consuming, particularly if the license is valuable. Applicants are often willing to exhaust all administration and litigation options.
- Beauty contest portion needs to be carefully structured to be fully transparent. Doubts over transparency of beauty contest process can lead to suspicions and dissatisfaction with the outcome.
- Can get expensive for the applicants if they are willing to spend large sums of money to succeed in the beauty contest portion of the process.



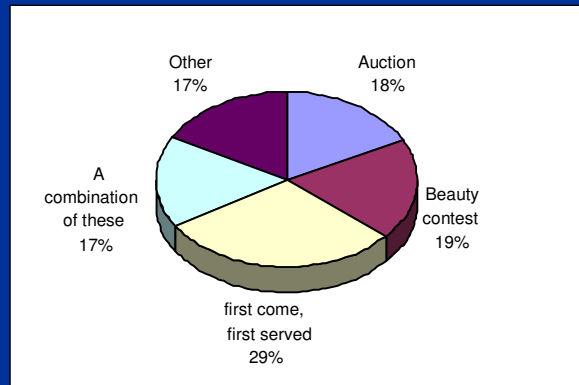
## Competing application procedures: Hybrid

### Disadvantages Hybrid (2)

- There may be some incentive for the government to act like any monopoly by restricting output and raising the price. In other words, if the government wanted to maximize the revenues to the treasury, it could withhold spectrum.
- Auctions may result in speculatively high bids for licenses for services that are not commercial at the time of the auction. Auctions can also be affected by hype and other non-economic forces.
- Full information on IMT-2000 market characteristics is not always available, leaving some or all bidders without adequate information on market conditions, the regulatory environment, demand characteristics and the likely pricing structures.
- Likelihood of winner's curse that results in high prices for the license and leads to decreased investment capacity for operators and high end-user prices



## Spectrum licensing methods



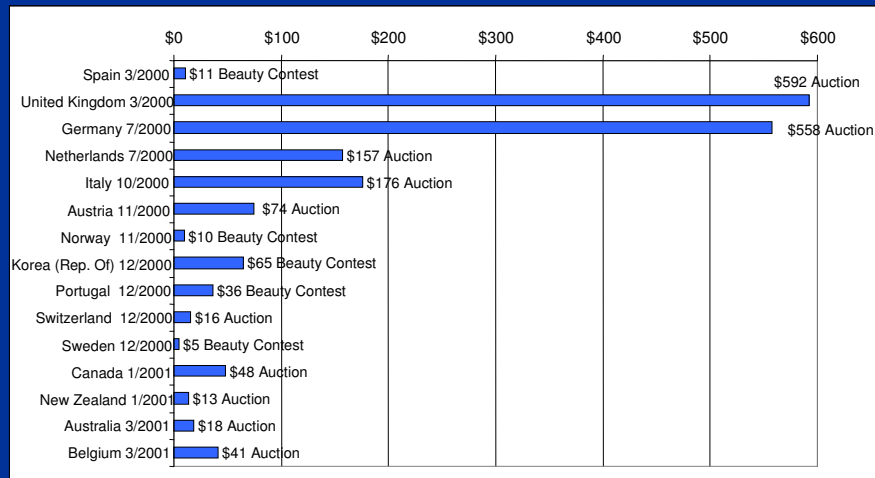
Source: ITU

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## 3G Licences: Average Cost per Inhabitant



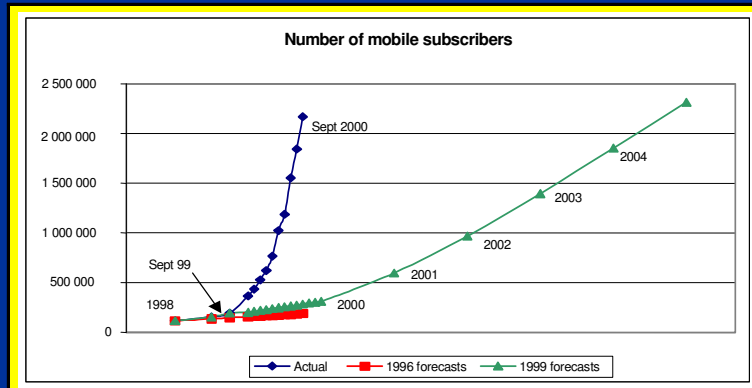
Source: ITU

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## Growth of Moroccan mobile subscribers



Source: ITU Effective Regulation: Moroccan Case Study.

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## Moroccan mini-case study

- ITU Case Studies on Effective Regulation: Moroccan Case Study  
Morocco found at at :[http://www.itu.int/ITU-D/treg/Case\\_Studies/Index.html](http://www.itu.int/ITU-D/treg/Case_Studies/Index.html)

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## IMT-2000 Licensing

“Licensing Condition - Obligations of licensees”



## Licensing condition

- Rights and Obligations should be contained in regulation, not in licenses
- Licensing conditions are among the regulatory issues that are of importance to developing countries
  - ◆ Technology Requirements
  - ◆ Financial requirements
  - ◆ Coverage
  - ◆ Timing of IMT-2000 licenses
  - ◆ Number of operators
  - ◆ Infrastructure Sharing



## Licensing condition

### Technology Requirements:

It is worth considering whether policy makers/regulators should follow a technology neutral approach or should mandate a particular technology and related migration path. **A technology neutral approach on has led to considerable benefits to end users in terms of a rapid technological evolution and lower prices.**

### Financial requirements:

Helps eliminate **non-serious players and ensure a certain level of performance.**



## Licensing condition

### Coverage:

To prevent the development of information-rich and information-poor communities, the policy makers/regulators of the various countries will need to ensure ubiquitous access to IMT-2000 services. **However, from the service provider's point of view, it may not be viable to roll out expensive infrastructure in high-cost areas. It may be preferable to roll out network coverage in phases, based on demand and likely applications.** Existing technologies and systems in place should have a scalable low cost migration path. Case studies have shown that operators can undertake gradual, phased upgrades to IMT-2000.



## Licensing condition

### Coverage and Roll-out

- To encourage the efficient use of spectrum by not leaving it unused longer than necessary
- To encourage infrastructure competition
- Coverage obligations introduced in many licences issued so far
- Roll-out of the 3G networks should be done according to market demand
- Coverage obligations should be linked to level of network service capability
- There is a danger of regulation driving the market if the level of these obligations is set too high

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## Licensing condition

### Timing of IMT-2000 licenses:

The timing for introduction of a new service is crucial and varies from country to country. It is necessary to judge the market potential and to deploy technologies that are proven and established. Developing countries can ill-afford to experiment with technology. However, the process of introducing wideband wireless services is time consuming and would require licensing and regulatory preparedness from an early period. It would be advisable that developing countries begin consultation right as early as possible.

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## Licensing condition

### Number of operators:

The limited availability of spectrum restricts the number of operators. In developed countries 3 to 5 operators have been preferred. Another issue is who should be eligible for this license: fixed operators, mobile operators, new operators, all or a combination of these. Japan, as an example, decided to exclude fixed operators from the licensing process. Mandatory roaming on 2 G networks: In case new operators are allowed to enter on the market, the regulator should decide whether to impose or not the obligation, on existing mobile operators, to provide pre-IMT-2000 roaming services to new entrants.



## Licensing condition

### Infrastructure Sharing:

Infrastructure sharing is particularly important for countries with widely dispersed populations and emerging mobile markets. It reduces the cost of network deployment and can improve penetration. It would also be necessary to identify the elements that can be shared, the amount of cost reduction that such sharing would bring about, for example, antenna masts, towers, and land building. Another issue for discussion is whether the regulator should play a pro-active role to encourage infrastructure sharing or should it be left entirely for operators.



## Licensing condition

### Sharing of facilities/infrastructure and National Roaming

- Sharing of facilities can give a rapid deployment of networks and introduction of services
- Sharing of network infrastructure may conflict with the goal of infrastructure competition
- Sharing should be on a commercial basis
- National roaming may be a way to achieve coverage of unprofitable regions
- Licence conditions should allow commercially negotiated roaming agreements, if infrastructure competition is maintained
- National roaming should only as an exception be mandatory. It can during a transitionally period help new operators to establish a market



## Licensing condition

### Miscellaneous items

- **Offered transmission speed**  
Some licences indicate minimum requirements, e.g. 256 kbit/s (depending on the level of mobility)
- **Duration of the licence**  
Offering licences for a period of less than 10 years would not encourage any serious deployment of infrastructure
- **Technical standard**  
Some licences clearly indicate the standard to be used, some "within the ITU IMT-2000 family of standards"





## Licensing condition/obligation

### Miscellaneous items

- **Universal service obligations**
  - ◆ Telecommunications as a right
  - ◆ Economic development
  - ◆ Close gap between haves and have nots
- **Other social obligations**
  - ◆ Human resource development
  - ◆ Technical
  - ◆ Management
  - ◆ Other
- **Encouraging ownership and control to promote diversity – local partners**
  - ◆ Minimum ownership and control by certain categories of persons