

Telecommunications
EMEA
Special report

European Telecoms — Spectrum Issues to the Fore

Analysts

Damien Chew, CFA
+44 20 7682 7603
damien.chew@fitchratings.com

Apostolos Bantis
+44 020 7682 7416
apostolos.bantis@fitchratings.com

Michael Dunning
+44 20 7417 6343
michael.dunning@fitchratings.com

Stuart Reid
+44 20 7417 4323
stuart.reid@fitchratings.com

Nikolai Lukashevich
+7 495 956 9968
nikolai.lukashevich@fitchratings.com

Bulent Akgul
+90 212 279 1065
bulent.akgul@fitchratings.com

Richard Petit
+44 020 7682 7503
richard.petit@fitchratings.com

Artem Frolov
+7 495 956 7075
artem.frolov@fitchratings.com

Key Conclusions

- Large spectrum auctions expected in 2010 and 2011 could mean significant cash outflows for western European telecoms operators. Unless prices are significantly higher than Fitch Ratings expects, spectrum costs by themselves are unlikely to prompt credit downgrades. However, these investments are likely to delay deleveraging. Furthermore, regulatory changes and potential new entrants may increase competitive intensity in certain markets.
- Spectrum investments are unlikely to create significant value. Fitch sees spectrum costs more as maintenance capex needed to keep a mobile operator's business going. Excess returns are likely to be slim and hard to capture — due to the competitive nature of spectrum auctions and the high level of competition in European mobile markets. While mobile data services have seen a strong initial take-up, it remains unclear how the business model may have to evolve for mobile operators to benefit from the increase in mobile traffic.
- There are significant economies of scale in operating mobile networks. In spectrum auctions, larger operators are able to justify higher bids due to their larger market share. They should also be in a better position to roll out technology upgrades (like fourth-generation mobile technology standard, LTE) which are likely to follow spectrum purchases.
- The operators most exposed to spectrum costs in western Europe are Vodafone group Plc (Vodafone, 'A-/Negative') and Royal KPN N.V. (KPN, 'BBB+' /Stable). For Vodafone, where mobile is a core business, potential spectrum investment is likely to dampen free cash flow (FCF) generation over the next two years — this is already partly reflected in Fitch's Negative Outlook. For KPN, E-Plus is a key part of its growth strategy. If auction prices in Germany become too high, E-Plus might have to settle for a smaller spectrum holding than its competitors, and pursue a niche strategy.

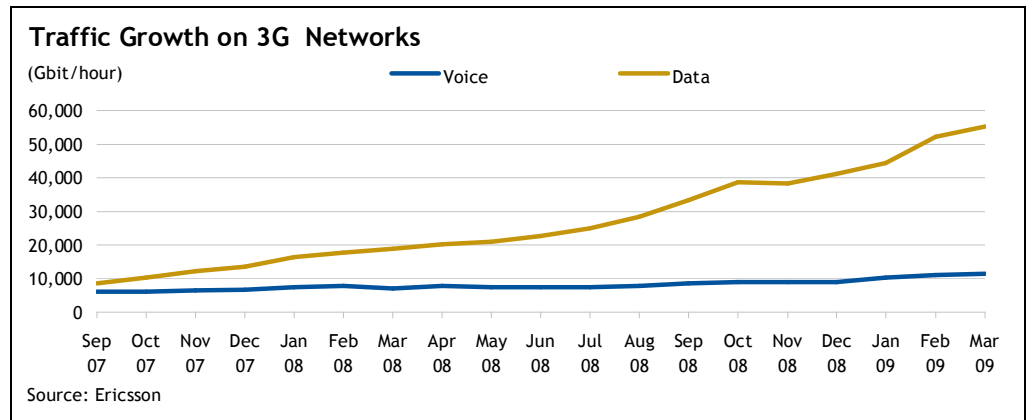
Spectrum Auctions in Europe Expected in 2010-11

Large spectrum auctions expected in 2010 and 2011 could mean significant cash outflows for western European telecoms operators.

Around twice as much spectrum is being made available to the telecoms industry in these upcoming auctions than was sold in the 3G auctions of 2000-2001. An overview of some of the larger auctions can be found in the *Appendix*.

This resulting boost in network capacity should help mobile operators meet the expected rapid growth of mobile data traffic (see chart *Traffic Growth on 3G Networks*). Mobile data has been — and should continue to be — the main driver of operators' mobile traffic requirements. Ericsson believes that 3G networks are currently carrying five times more data traffic than voice. Taking into account 2G networks, the overall voice/data traffic mix is around 50%:50%.

Fitch does not believe mobile traffic growth is likely to significantly slowdown in the medium-term, as mobile data services are being increasingly adopted by the mass-market consumer. With more spectrum to support the deployment of newer technology like LTE, mobile operators should be able to lower their unit cost of transporting traffic across their networks, as well as meeting growing traffic volumes.

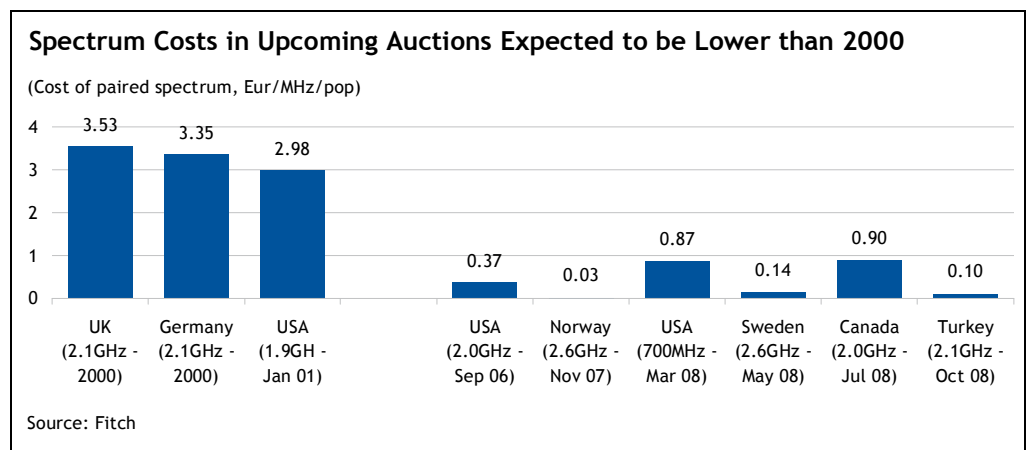


The spectrum being allocated in 2010-11 comes from a variety of sources.

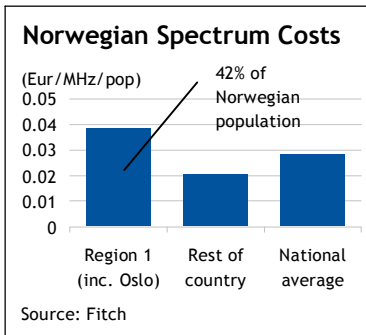
- **UMTS expansion band.** Across Europe, governments have 190MHz of spectrum at 2.6GHz frequencies to allocate, which compares with the 140MHz of spectrum that was sold in 2000-2001. Norway and Sweden are the only European countries to have completed their allocation process.
- **The digital dividend from the analogue TV switch-off.** Analogue TV signals using spectrum at 800MHz are being gradually terminated across Europe. This process should be complete by 2012, with the spectrum freed up for other uses, including telecoms. The UK, French and Germany regulators are planning on releasing 112MHz, 72MHz and 60MHz, respectively.
- **Left-over 2G and 3G spectrum.** Some European telecoms regulators have unassigned spectrum left over from previous auctions, eg In France and Belgium, regulators have been trying to award their unused fourth 3G licences, while two unused 3G licences are to be sold off in Germany.

The Declining Cost of Spectrum

The cost of spectrum in 2010-11 should be sharply lower than the record prices achieved in the 2000-2001 3G auctions held in Europe and the US. The chart *Spectrum Costs in Upcoming Auctions Expected to be Lower than 2000* shows that recent spectrum auctions have achieved much lower unit prices (usually expressed as the cost of a MHz of spectrum per head of population). However, with the large amounts of spectrum being made available in the upcoming auctions, the absolute amount spent by the industry is likely to be significant.



Looking at the European auctions that took place in 2007 and 2008, the prices achieved in Turkey and Norway were low as the auctions were uncompetitive. In Turkey, there were three bidders for four licences, while in Norway there was



enough spectrum available for both the network operators. Sweden is a more competitive market – with four operators – so prices were understandably higher. However, the population density in Sweden is low at 20 inhabitants/square km (sq km), compared with 157 for the five largest countries in Europe.

Fitch believes population density is a key factor affecting spectrum prices (see next section). Its affect on spectrum prices was also clearly demonstrated in the Norwegian auctions where spectrum unit prices for the most densely populated region were 87% higher than in the remaining five regions (see *Norwegian Spectrum Costs* chart in the margin). Therefore, competitive markets with higher population densities could therefore achieve higher spectrum unit prices than Sweden.

Applying the EUR0.145 MHz/population achieved in the Swedish auction to the UK and Germany, and assuming all available spectrum is sold, would give total spectrum costs of EUR2.8bn and EUR4.3bn, respectively.

Prices achieved in spectrum auctions are hard to predict, but Fitch believes (as a rough first estimate) that mobile operators in Europe may make spectrum investments of around EUR500m in each of the larger European countries, and around EUR100m-200m in each of the smaller European territories.

The Uncertain Cost of Spectrum

Various supply and demand factors have an impact on prices, and hence give rise to uncertainty in estimating spectrum costs. Spectrum unit prices have declined from the heady levels achieved during the “dot.com boom”, but even the recent auctions held in the past few years show a large variability. The table *Factors Affecting the Price of Spectrum* highlights some of the key factors.

The most important is the frequency of the spectrum, which is especially relevant in these upcoming European auctions with 800MHz spectrum becoming available. Lower-frequency spectrum is more valuable than spectrum at higher radio frequencies. The 700MHz spectrum auctions in the US raised USD20bn for the US government, and attracted considerable interest. In broad terms: the lower the frequency of the spectrum, the further the distance they are able to travel and the better the penetration of buildings. This means that fewer base stations are needed to provide coverage using lower-frequency spectrum.

Factors Affecting the Price of Spectrum

Spectrum frequency	Lower-frequency spectrum is generally seen to be more valuable. This has been clear from the recent US spectrum auctions, and should be evident in Europe as digital dividend spectrum becomes available.
Competitive auction	A higher number of bidders for any given amount of spectrum is likely to drive up auction prices. Auction design can affect the competitiveness of an auction.
Population density	In general, spectrum is more valuable in countries with a higher population density.
Technology	Operators may be able to minimise spectrum requirements by improving capacity through better network management or by utilising recent technology developments like femtocells. In the long-term, having more spectrum gives operators more operational flexibility.
Uncertain business model	Initial demand for mobile data services shows significant potential, but it remains unclear how operators will participate in the value chain. With mobile data driving traffic requirements and spectrum needs, this lack of clarity might hold back higher auction bids.
State of the economy	The economic downturn and tighter credit conditions makes funding of spectrum investments more difficult, especially for smaller operators and potential new entrants.

Source: Fitch

While higher-frequency spectrum may be better suited to providing coverage in dense urban environments, lower frequencies are seen to be more valuable. This is especially true with mobile data, where signal strength determines the quality of the data connection. According to modelling work done by UK telecoms regulator

Ofcom, UK operators could save around GBP1.7bn by deploying 3G technology using 900MHz rather than 2.1GHz.

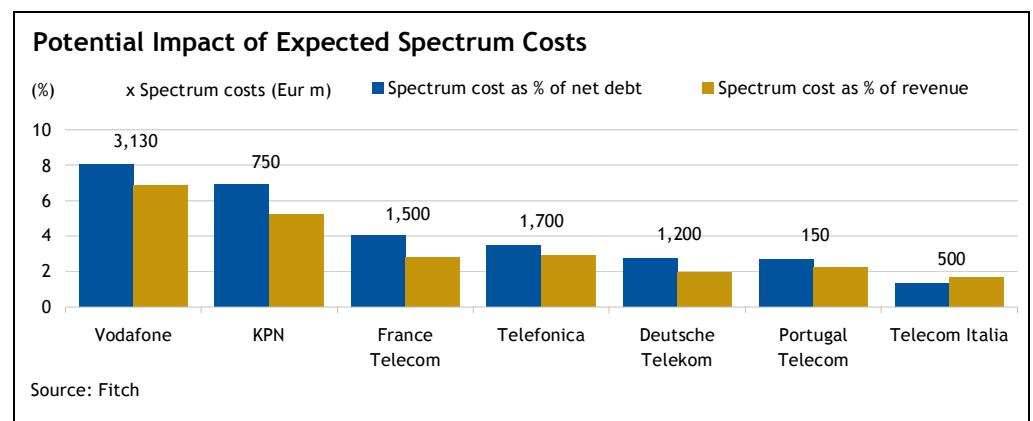
Auction design also plays a role. Some governments are planning on setting aside spectrum for potential new entrants, which might reduce the spectrum available for existing players and therefore create a more competitive auction for the remaining frequencies (eg the Canadian auction in 2008, and proposals for upcoming auctions in Belgium and the Netherlands). Alternatively, caps might limit the amount of spectrum that existing players may buy, hence reduce auction price competition (eg proposed caps in the UK). Details of operators' existing spectrum holdings can be found in the *Appendix*.

Impact on Credit Profiles

Spectrum Investment should be Viewed as Maintenance Capex

Fitch believes that spectrum investments are unlikely to create significant value. The agency sees spectrum costs more as maintenance capex needed to keep a mobile operator's business going. Excess returns are likely to be slim and hard to capture, due to the competitive nature of spectrum auctions and the high level of competition in European mobile markets. While mobile data services have seen a strong initial take-up so far, it remains unclear how the business model may evolve for mobile operators to benefit from the increase in mobile data usage, especially if operators only derive revenue from flat-rate mobile data plans.

The benefits from any purchase of new spectrum are unlikely to be visible in the next two years. Most European operators still have unused 3G spectrum. Given that further upgrades in 3G technology are still to be deployed, Fitch believes that new 4G technology like LTE will see significant deployment only in 2012. Like previous advances in mobile networks, it will also take some time before devices and laptops with LTE technology achieve significant penetration of the subscriber base. However, in certain cases, having more spectrum may allow an operator to reduce capex. For example, deploying additional spectrum in congested areas to provide extra capacity may reduce the need for additional cell sites and radio equipment.



To come up with a rough estimate of how much operators could spend on spectrum in 2010-11, Fitch has made some simple assumptions per country: EUR500m for each of the larger European countries, and EUR100m-200m for each of the smaller. In the case of Germany, where there is likely to be a competitive auction for the valuable 800MHz spectrum, Fitch's estimates of EUR500m could be exceeded. The agency has also assumed Vodafone could spend USD1bn for a pan-Indian 3G licence (reserve price USD751m) and USD300m for Telefonica SA's (Telefonica, 'A'/'Stable') participation in auctions in Mexico and Columbia together.

Fitch's estimates are illustrated in the chart *Potential Impact of Expected Spectrum Costs* (for both large and small European countries as well as key emerging markets) expressed as a percentage of historical net debt and revenue. Relative to the

amount of net debt and revenue, spectrum costs are unlikely to be onerous for the larger European telecoms operators. By themselves, they are unlikely to prompt downgrades, but these spectrum investments are likely to delay deleveraging.

The operators most exposed to the issue of spectrum costs are Vodafone and KPN. A summary of key financials for selected European telecoms operators, and the impact of spectrum costs, can be found in the table below.

Vodafone ('A-'/Negative Outlook)

Vodafone is a mobile-centric operator which has put mobile broadband at the heart of its strategy. Potential spectrum investment is one of the main reasons why Fitch expects an increase in Vodafone's overall capex (including licences). This in part contributes to the downward pressure on Vodafone's cash flow generation, which is the rationale for Fitch's Negative Outlook on Vodafone's credit rating (see Fitch's report on Vodafone, dated 4 August 2009). Note that Vodafone management's outlook for FCF (before dividends and spectrum costs) is for an increase to GBP6.0bn-6.5bn in FY09-10 from GBP5.7bn in FY08-09.

European Telecoms - Historical Financials and Impact of Expected Spectrum Costs (EURm)

Operator	Rating	Outlook	Revenue	EBITDA	EBITDA margin (%)	Net Debt	FCF bef dividends	Adj Net Debt / EBITDAR (X)	Spectrum costs % net debt	Spectrum costs % revenue	Spectrum costs / EBITDA
Deutsche Telekom	BBB+	Stable	61,666	18,160	29.40	43,568	6,661	3.0	2.8	1.9	0.07x
France Telecom	A-	Stable	53,488	19,007	35.50	37,278	7,783	2.3	4.0	2.8	0.08x
KPN	BBB+	Stable	14,427	5,058	35.10	10,842	2,076	2.5	6.9	5.2	0.15x
Portugal Telecom	BBB	Stable	6,734	2,443	36.30	5,632	493	2.7	2.7	2.2	0.06x
Telecom Italia	BBB	Stable	30,158	11,367	37.70	37,378	2,600	3.6	1.3	1.7	0.04x
Telefonica	A-	Stable	57,946	22,919	39.60	48,911	8,470	2.4	3.5	2.9	0.07x
Vodafone*	A-	Negative	44,147	15,585	35.30	37,716	5,330	2.9	8.0	6.9	0.19x

Note: All financials based on last reported full-year results, according to Fitch definitions. Vodafone's financials have been converted at GBP/EUR = 1.0763
Source: Fitch

KPN ('BBB+'/Stable Outlook)

While Fitch believes that KPN's cash flow generation profile maintains adequate capacity to support potential spectrum investment (estimated at around EUR750m), this will need to be balanced by a more conservative shareholder distribution policy before pressure increases on the rating. Germany is key – a successful outcome for KPN would be the purchase of spectrum at a sensible price to maintain E-Plus's competitive long-term position, and to support the longer-term growth. However, with insufficient 800MHz spectrum for all four German operators, an excessive bidding war against larger competitors might mean E-Plus having to settle for a smaller spectrum holding and pursuing a niche strategy. Fitch believes that KPN's management will remain disciplined and focus on return on investment in assessing any future investments in Germany. A medium-term strategic option might involve network sharing.

Impact on the Competitive Landscape

In assessing the impact on credit profiles, the change in competitive intensity (while harder to quantify) is just as important as the amount spent on spectrum. There are two general factors affecting competitive intensity which to some extent offset each other:

- The increase in competitive intensity from potential new entrants and regulatory changes accompanying these spectrum auctions.
- The benefits of scale economies for the larger players, and high spectrum costs and capex rollout which act as a barrier to entry.

The upcoming spectrum auctions – and the accompanying regulatory changes – could see the arrival of new entrants. France and Belgium are trying to issue fourth

3G licences, while some regulators (eg Netherlands, Belgium) are proposing to reserve some spectrum in the auction process for new entrants. With the trend of declining spectrum prices, and the large amounts of spectrum available, prices might be low enough for new entrants to participate in the auction. Despite the significant fixed investment required to build a network from scratch, new entrants might provide enough incremental competition to pressure marginal revenue.

Regulation may also change the intensity of competition. Redistribution of 900MHz spectrum is a key competitive issue. In some European countries (UK, Spain, Germany), there are marked inequalities as to how 900MHz spectrum (which is more valuable because it is lower frequency) is distributed amongst the current mobile operators. Steps to re-distribution existing 900MHz spectrum or cap new purchases of 800MHz may allow all operators in a particular market to move towards a more even distribution of attractive sub-1GHz spectrum.

Spectrum caps are not always effective in levelling the playing field. For example, in Germany, the regulator has 2x30MHz of 800MHz spectrum to award amongst the four operators. The two larger operators, Vodafone and T-Mobile are not allowed to buy more than 2x10MHz, while O2 and E-Plus may not buy more than 2x15MHz. If the two largest operators both buy 2x10MHz (which is likely), then O2 and E-Plus will have to share 2x10MHz. This is compounded by the unequal 900MHz spectrum allocation - the two largest operators each have 2x12.4MHz, while the smaller operators each have 2x5MHz.

Economies of Scale - Big Operators may Emerge as Winners

In general, there are scale efficiencies in operating a telecoms network. In spectrum auctions, larger operators are able to justify higher bids due to their larger market share. They should also be in a better position to roll out technology upgrades (like LTE) which are likely to follow spectrum purchases. These advantages may still be enough for larger operators to maintain their competition position against new entrants which have managed to overcome the barriers to entry of spectrum costs and rollout capex.

Turkish 3G Auctions - October 2008

	MHz	Cost ex-tax (EURm)	Population (m)	Cost/unit (EUR/MHz/pop)	Subs - Dec 08 (‘000s)	Cost/sub (EUR/MHz/sub)
Turkcell	40	358	74.88	0.120	37,000	0.242
Vodafone	35	250	74.88	0.095	16,720	0.427
Avea	30	214	74.88	0.095	12,100	0.590
Total	105	822	74.88	0.105	65,820	0.119

Source: Fitch

A good example of how this scale advantage plays out can clearly be seen from the Turkish 3G auction. Turkcell Iletisim Hizmetleri A.S (Turkcell, ‘BB’/Rating Watch Positive), the market leader in Turkey, paid more than its competitors on an absolute and unit price basis for its 3G licence. Yet, because it had such a large subscriber base and greater scale, the cost of spectrum that Turkcell paid per subscriber was still 40% less than that paid by Vodafone, its largest competitor.

This scale benefit was also clearly demonstrated in the US700MHz auctions where the big winners were AT&T (‘A’/Stable) and Verizon Communications (‘A’/Stable). Verizon Wireless, the leading US mobile operator co-owned by Vodafone and Verizon Wireless, is planning to roll out LTE in 2010 – utilising the 700MHz spectrum it purchased in 2008.

The point is that larger operators can afford to significantly outbid their smaller rivals, and still maintain a cost advantage.

Appendix

Spectrum Auction Plans – Selected Countries

Country	Date	Comment
Western Europe		
Belgium	Fourth 3G licence – 2010 2.6GHz – 2010	The fourth UMTS 3G licence to be awarded in 2010. Procedures for the 2.6GHz and 3.6GHz spectrum allocation are under preparation, with auctions likely to start in 2010. There is ongoing debate around a possible digital dividend.
France	Fourth 3G Licence – Q4 2009 800MHz and 2.6GHz – 2010	The fourth 3G licence should be awarded before the end of 2009 - Iliad is the only bidder. The allocation process of 800MHz and 2.6GHz spectrum is expected to be launched in 2010. 72MHz of 800MHz spectrum (digital dividend) is being made available.
Germany	800MHz, 2.1GHz, 2.6GHz – mid-2010 but might be delayed by legal challenges	The German regulator has announced plans for a spectrum auction in H110. The auction is expected to raise over EUR4bn. In addition to 2.1GHz (3G) and 2.6GHz spectrum, the auction will include allocations in the 790MHz to 862MHz range. There are only six 2x5MHz blocks of this valuable 800MHz spectrum available - Vodafone and T-Mobile are capped at buying two blocks, while E-Plus and O2 are capped at buying 3 blocks.
Italy	2.6GHz – 2010-2011	Frequencies are being vacated by the Italian military. Preliminary consultations for the 2.6GHz and digital dividend spectrum have taken place, but not much progress has been reported.
Netherlands	2.6GHz – Q1 2010	The auction of 2.6GHz frequency spectrum is expected in Q110. Six concessions with a maximum of 40MHz each are expected to be offered. Consultation on Digital Dividend to commence in Q110.
Spain	2.6GHz – 2010	The allocation of 2.6GHz and 3.5GHz spectrum is expected in 2010 pending further regulatory clarity. The auction process would also include the re-farming of second-generation 900MHz and 1.8GHz spectrum.
UK	800MHz and 2.6GHz – mid-2010 but could be delayed by proposed T-Mobile/Orange merger	The planned merger of mobile operators T-Mobile and Orange may delay the UK's proposed auction up until 2011. Current proposals include a 2x65MHz cap on sub-3 GHz spectrum. Current holders of sub-1GHz spectrum are capped at 2x17.5MHz (any bid by them for additional sub-1GHz spectrum such as participation in the 800MHz auction, would require them to relinquish an amount of 900MHz bandwidth in the ratio 1:1). Any operator holding more than 2x25MHz of 2G spectrum and which acquires additional spectrum in the auction (of whatever frequency) will be required to relinquish a 2x5MHz block of 2G spectrum.
Emerging Markets		
India	2.1GHz (3G) – Q1 2010	The 2.1GHz auction spectrum for 3G is set to start in Q110. The regulator has set the reserve price for a pan-India 3G licence at IDR35bn USD751m).
Thailand	2.1GHz (3G) – Q1 2010 Could be delayed by legal issues	Auction expected in early 2010, but subject to legal issues being resolved. Thailand's telecoms regulator has set reserve prices for the 3G licences auction at THB4.6bn (USD138m) for the three 10MHz bandwidth licences, and THB5.2bn (USD156m) for the 15MHz bandwidth. The regulator has said that the auction could raise around USD1.2bn in total.
Mexico	1.7GHz/1.9GHz – 2010	The auction of 1.7GHz and 1.9GHz 3G spectrum is expected to take place in early 2010. Press reports indicate that the total amount raised could be USD1bn-1.5bn. The auction is designed to promote the entry of one new competitor to counter-balance the strength of leading operator America Movil's Telcel.

Source: Fitch

Spectrum Allocation in Western Europe - Selected Countries (MHz)

Country	Operator	GSM (paired)		Total	UMTS - 2.1GHz		GSM+UMTS
		900	1800		Paired	Unpaired	Paired
Belgium	Proximus	2x 12.0	2x 15.0	2x 27.0	2x 15.0	5.0	2x 42.0
	Mobistar	2x 12.0	2x 15.0	2x 27.0	2x 15.0	5.0	2x 42.0
	Base	2x 8.6	2x 22.0	2x 30.6	2x 15.0	5.0	2x 45.6
	Total	2x 32.6	2x 52.0	2x 84.6	2x 45.0	15.0	2x 129.6
France	Bouygues Tel.	2x 9.8	2x 26.6	2x 36.4	2x 14.8	5.0	2x 51.2
	SFR	2x 12.4	2x 23.8	2x 36.2	2x 14.8	5.0	2x 51.0
	Orange	2x 12.4	2x 23.8	2x 36.2	2x 14.8	5.0	2x 51.0
	Total	2x 34.6	2x 74.2	2x 108.8	2x 44.4	15.0	2x 153.2
Germany	T-Mobile	2x 12.4	2x 5.0	2x 17.4	2x 10.0	5.0	2x 27.4
	Vodafone D2	2x 12.4	2x 5.0	2x 17.4	2x 10.0	5.0	2x 27.4
	E-Plus	2x 5.0	2x 17.4	2x 22.4	2x 10.0	5.0	2x 32.4
	O2 Germany	2x 5.0	2x 17.4	2x 22.4	2x 10.0	-	2x 32.4
	Total	2x 34.8	2x 44.8	2x 79.6	2x 60.0	25.0	2x 139.6
Italy	Vodafone	2x 10.0	2x 15.0	2x 25.0	2x 10.0	5.0	2x 35.0
	TIM	2x 11.8	2x 15.0	2x 26.8	2x 10.0	5.0	2x 36.8
	Wind	2x 5.0	2x 15.0	2x 20.0	2x 10.0	5.0	2x 30.0
	Hutchison Italy				2x 15.0	5.0	2x 15.0
	Total	2x 26.8	2x 45.0	2x 71.8	2x 60.0	25.0	2x 131.8
Netherlands	Vodafone	2x 11.4	2x 5.2	2x 16.6	2x 15.0	5.0	2x 31.6
	KPN	2x 12.4	2x 20.0	2x 32.4	2x 15.0	5.0	2x 47.4
	T-Mobile	2x 5.0	2x 16.8	2x 21.8	2x 10.0	5.0	2x 31.8
	Orange (acquired by T-Mobile)	2x 5.0	2x 15.0	2x 20.0	2x 10.0	5.0	2x 30.0
	Total	2x 33.8	2x 57.0	2x 90.8	2x 50.0	25.0	2x 140.8
Portugal	TMN	2x 8.0	2x 6.0	2x 14.0	2x 20.0	6.7	2x 34.0
	Telecel	2x 8.0	2x 6.0	2x 14.0	2x 20.0	6.7	2x 34.0
	Optimus	2x 7.8	2x 6.0	2x 13.8	2x 20.0	6.7	2x 33.8
	Total	2x 23.8	2x 18.0	2x 41.8	2x 60.0	20.0	2x 101.8
Spain	Vodafone	2x 12.5	2x 24.8	2x 37.3	2x 15.0	5.0	2x 52.3
	Telefonica						
	Moviles	2x 16.5	2x 24.8	2x 41.3	2x 15.0	5.0	2x 56.3
	Amena	2x 6.0	2x 24.8	2x 30.8	2x 15.0	5.0	2x 45.8
	Xfera (Yoigo)	2x 5.0			2x 15.0	5.0	2x 15.0
	Total	2x 40.0	2x 74.4	2x 109.4	2x 60.0	20.0	2x 169.4
UK	O2	2x 17.2	2x 5.8	2x 23.0	2x 10.0	5.0	2x 33.0
	T-Mobile		2x 30.0	2x 30.0	2x 10.0	5.0	2x 40.0
	Orange		2x 30.0	2x 30.0	2x 10.0	5.0	2x 40.0
	Vodafone	2x 17.2	2x 5.8	2x 23.0	2x 14.8	-	2x 37.8
	Hutchison 3G				2x 14.6	5.1	2x 14.6
	Total	2x 34.4	2x 71.6	2x 106.0	2x 59.4	20.1	2x 165.4

Note: In the Netherlands, following the acquisition of Orange by T-Mobile in September 2007, T-Mobile may have to return some of the spectrum that Orange owns
Source: Fitch

ALL FITCH CREDIT RATINGS ARE SUBJECT TO CERTAIN LIMITATIONS AND DISCLAIMERS. PLEASE READ THESE LIMITATIONS AND DISCLAIMERS BY FOLLOWING THIS LINK: [HTTP://FITCHRATINGS.COM/UNDERSTANDINGCREDITRATINGS](http://FITCHRATINGS.COM/UNDERSTANDINGCREDITRATINGS). IN ADDITION, RATING DEFINITIONS AND THE TERMS OF USE OF SUCH RATINGS ARE AVAILABLE ON THE AGENCY'S PUBLIC WEB SITE AT WWW.FITCHRATINGS.COM. PUBLISHED RATINGS, CRITERIA, AND METHODOLOGIES ARE AVAILABLE FROM THIS SITE AT ALL TIMES. FITCH'S CODE OF CONDUCT, CONFIDENTIALITY, CONFLICTS OF INTEREST, AFFILIATE FIREWALL, COMPLIANCE, AND OTHER RELEVANT POLICIES AND PROCEDURES ARE ALSO AVAILABLE FROM THE CODE OF CONDUCT SECTION OF THIS SITE.

Copyright © 2009 by Fitch, Inc., Fitch Ratings Ltd. and its subsidiaries. One State Street Plaza, NY, NY 10004. Telephone: 1-800-753-4824, (212) 908-0500. Fax: (212) 480-4435. Reproduction or retransmission in whole or in part is prohibited except by permission. All rights reserved. All of the information contained herein is based on information obtained from issuers, other obligors, underwriters, and other sources which Fitch believes to be reliable. Fitch does not audit or verify the truth or accuracy of any such information. As a result, the information in this report is provided "as is" without any representation or warranty of any kind. A Fitch rating is an opinion as to the creditworthiness of a security. The rating does not address the risk of loss due to risks other than credit risk, unless such risk is specifically mentioned. Fitch is not engaged in the offer or sale of any security. A report providing a Fitch rating is neither a prospectus nor a substitute for the information assembled, verified and presented to investors by the issuer and its agents in connection with the sale of the securities. Ratings may be changed, suspended, or withdrawn at anytime for any reason in the sole discretion of Fitch. Fitch does not provide investment advice of any sort. Ratings are not a recommendation to buy, sell, or hold any security. Ratings do not comment on the adequacy of market price, the suitability of any security for a particular investor, or the tax-exempt nature or taxability of payments made in respect to any security. Fitch receives fees from issuers, insurers, guarantors, other obligors, and underwriters for rating securities. Such fees generally vary from US\$1,000 to US\$750,000 (or the applicable currency equivalent) per issue. In certain cases, Fitch will rate all or a number of issues issued by a particular issuer, or insured or guaranteed by a particular insurer or guarantor, for a single annual fee. Such fees are expected to vary from US\$10,000 to US\$1,500,000 (or the applicable currency equivalent). The assignment, publication, or dissemination of a rating by Fitch shall not constitute a consent by Fitch to use its name as an expert in connection with any registration statement filed under the United States securities laws, the Financial Services and Markets Act of 2000 of Great Britain, or the securities laws of any particular jurisdiction. Due to the relative efficiency of electronic publishing and distribution, Fitch research may be available to electronic subscribers up to three days earlier than to print subscribers.