

**KPN position paper following Dutch spectrum  
auction**

*4G LTE services to be introduced in February 2013*

## 1 Executive summary

- KPN acquired a highly attractive spectrum package of 2×10MHz in the 800MHz band, 2×10MHz in the 900MHz band, 2×20MHz in the 1800MHz band, 2×5MHz in the 2.1GHz band and 30MHz in the 2.6GHz TDD band
- KPN is convinced that the acquired licenses will generate a good return on investment
- This spectrum package guarantees continuation of existing services and enables the deployment of new services for our customers for a period of 17 years
- KPN's leading position in the Dutch mobile market will be strengthened:
  - In mobile broadband KPN will extend its quality leadership using its existing 3G (HSPA) network and the roll-out of the next generation 4G LTE mobile technology across The Netherlands
  - In mobile voice, KPN will continue to offer the highest quality services through its 2G (GSM) network
- 4G services will be introduced in February 2013, with the Randstad area (approximately 50% of the Dutch population) to be covered by mid-2013 and nationwide coverage in H2 2014
- KPN remains the only integrated access provider in the Dutch consumer and business market, offering the highest quality services through a combination of its own 4G LTE network and its hybrid copper and fiber infrastructure

## 2 Background

KPN is the leading provider of mobile services in The Netherlands, with nearly 10 million mobile subscribers and a market share of around 45%. The foundation of KPN's strong position is its continued focus on quality of products and services. Consumers and businesses recognise that KPN provides the best customer experience. This is a result of KPN operating the highest quality network in The Netherlands and its dynamic product offerings.

KPN currently offers market leading coverage and quality voice services through its 2G (GSM) and 3G (HSPA<sup>1</sup>) networks. At the same time its 3G network provides the fastest and most reliable mobile broadband services. KPN will ensure that these strengths are not only maintained but enhanced. In the context of mobile broadband, KPN will introduce 4G LTE services in February 2013, with the aim of having the highest quality 4G LTE network in The Netherlands. In recent months KPN has been preparing its network for the 4G LTE roll-out, and will be in a position to switch on a 4G LTE network in February 2013, initially in the northern part of the Randstad. Full coverage of the Randstad area will be achieved by mid-2013, covering approximately 50% of the Dutch population. KPN will offer nationwide 4G LTE services to its customers in the second half of 2014.

The maintenance of both quality and service leadership is underpinned by strategic investments in the mobile network and KPN's spectrum holdings. Spectrum is a scarce resource, and as such a key asset determining any operator's quality of service levels. In the concluded auction, KPN was determined to invest in sufficient spectrum to replace its existing licenses that are about to expire (as

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<sup>1</sup> HSPA is an advanced version of the 3G technology UMTS.

shown in Annex A), as well as invest in additional spectrum to enable the rapid deployment of new 4G LTE services. The 800MHz, 900MHz, 1800MHz and 2.6GHz licenses included in the auction will run for 17 years.

### 3 Overview of the auction

A total amount of 359.7MHz spectrum was available in the auction (see Table 3.1), spanning six frequency bands. This included existing licenses in the 900MHz and 1800MHz bands that are due to expire in 2013.

Frequency band	Total bandwidth	Block size	Number of licenses	Expiry Date
800MHz	2x30MHz	2x5MHz	6 <sup>2</sup>	11 May 2030
900MHz	2x35MHz	2x5MHz	7	11 May 2030 <sup>3</sup>
1800MHz	2x70MHz	2x5MHz	14	11 May 2030 <sup>3</sup>
1900MHz (TDD <sup>4</sup> )	1x14.7MHz	1x14.7MHz	1	31 Dec 2016
2.1GHz	2x10MHz	2x5MHz	2	31 Dec 2016
2.6GHz (TDD <sup>4</sup> )	1x55MHz	1x5MHz	11	11 May 2030

Table 3.1 Spectrum included in the auction

All auctioned licenses will expire on 11 May 2030, with the exception of:

- the 2.1GHz and 1900MHz bands which will expire at the end of 2016, at the same time as the other licenses in these bands; and
- potentially the 900MHz and 1800MHz bands. According to the auction process, KPN and other existing 900MHz/1800MHz license holders have the right to apply for an extension of their pre-auction 900MHz/1800MHz holdings for a maximum period of 21 months. This would mean that KPN could assume its new holdings on 26 November 2014, with the new licenses expiring on 1 February 2032. KPN is currently assessing this option

The auction format used was a combinatorial clock auction (CCA), similar to the format used for the 2.6GHz auction in 2010. An explanation of the auction format, including the methodology by which winners' prices were calculated, is provided in Annex B.

Two 2x5MHz licenses in the 800MHz band were reserved for new entrants. KPN was opposed to this reservation as it reduced the amount of low-frequency spectrum available to existing operators.

<sup>2</sup> Two licenses of 2x5MHz in the 800MHz band were reserved for new entrants.

<sup>3</sup> Assuming existing licenses are not extended.

<sup>4</sup> This spectrum is suitable for TDD (Time Division Duplex) technologies. These technologies alternate in time between uplink and downlink transmissions, and thus require unpaired spectrum. The other bands are suitable for FDD (Frequency Division Duplex) technologies, which use separate frequencies for uplink and downlink transmissions. The vast majority of current mobile networks use FDD technologies.

The licenses issued are 'technology neutral', meaning that they may be used for any technology including the three main mobile technologies: 2G (GSM), 3G (HSPA) and 4G LTE.

Each frequency band has an associated coverage obligation, which specifies mandatory levels of coverage at two and five years after the licenses start, at which time license owners must offer a commercial service to the covered areas. As a company focusing on providing ubiquitous mobile coverage at the highest standard across technologies, KPN's intended roll-out plans are well beyond the coverage obligations, which are described in more detail in Annex C.

## 4 Overview of the spectrum bands

There are currently five main mobile spectrum bands available across Europe: 800MHz, 900MHz, 1800MHz, 2.1GHz and 2.6GHz bands. Spectrum across all of these bands was available as part of the auction process.

The spectrum bands differ strongly in their characteristics and are used to provide different mobile services. Therefore, in order to support its business strategy, it is important that a mobile operator has a balanced and appropriate portfolio of spectrum across the bands.

There are two important ways in which spectrum bands differ:

- Technology ecosystem available for the band
- Propagation of the band

### 4.1 Technology ecosystems by band

Technology ecosystems have developed for each of the European spectrum bands, and only certain technologies are available in each band as illustrated in the table below.

Spectrum band	Technologies available in the band
800MHz	4G LTE
900MHz	GSM and UMTS/HSPA <sup>5</sup>
1800MHz	GSM and 4G LTE
2.1GHz	UMTS/HSPA
2.6GHz	4G LTE (using the TDD variant in the TDD part of the band)

Table 4.1 Main mobile technologies available today by spectrum band in Europe<sup>6</sup>

Economies of scale are of utmost importance in the manufacturing of mobile equipment, and particularly for end user devices such as handsets and tablets. Mainstream equipment manufacturers

<sup>5</sup> Net4Mobility, a joint venture between Telenor and Tele2, has deployed an LTE network in Sweden. However, as far as we are aware, this is the only LTE 900MHz network in the world. Therefore, we do not consider LTE to be a mainstream technology for the 900MHz band.

<sup>6</sup> The 1900MHz TDD band is currently unused across Europe. Potential future mobile bands (e.g. 700MHz, 1.4GHz, 3.5GHz) are excluded as no technology ecosystems currently exist in these bands.

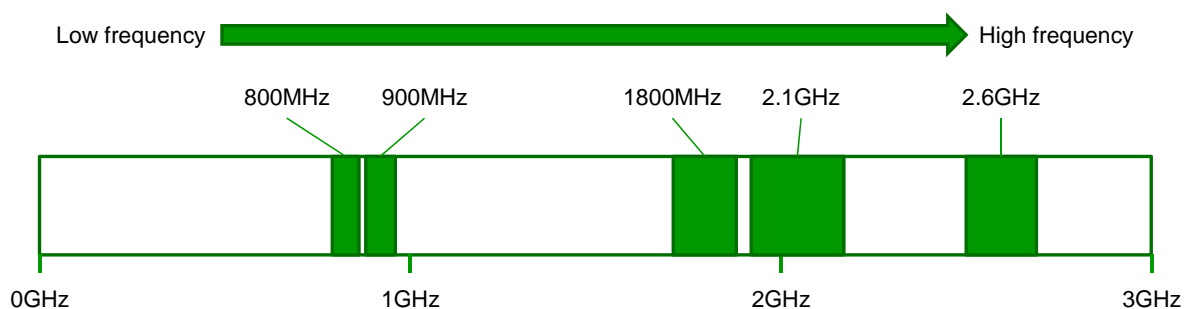
develop devices for major global markets (Europe, Asia and North America). Therefore, every European operator, including KPN, is strongly incentivised to conform to the technologies that are available in each band. Choosing a non-standard technology would likely result in mainstream devices not being available for that operator, or customised devices being significantly more expensive.

Therefore, any mobile operator must have sufficient spectrum in the standard mobile bands for a technology it wishes to deploy. For example, a European operator wishing to deploy LTE requires spectrum in at least one of the 800MHz, 1800MHz or the 2.6GHz bands.

## 4.2 Propagation

Lower frequency spectrum has better propagation characteristics than higher frequency spectrum. Signals using low frequency spectrum travel further than using higher frequencies. This means that operators with lower frequency spectrum can provide coverage deep indoors and across rural areas with much fewer base stations and at lower cost.

Figure 4.1 below shows the five mainstream mobile spectrum bands in Europe.



*Figure 4.1 Mainstream European mobile spectrum bands*

Two of the five bands, the 800MHz and 900MHz bands, are significantly lower frequency than the other three. Accordingly, these bands are very important to mobile operators to provide high quality coverage both deep indoors and in rural areas. The other three bands (1800MHz, 2.1GHz and 2.6GHz) are typically used to add capacity in areas with high traffic volumes. Therefore, it is important that an operator has an appropriate combination of low and high frequency spectrum in order to offer high quality coverage whilst at the same time having ample capacity to meet traffic demand. This is particularly the case for an incumbent market leader whose brands and propositions rely on having the highest quality services in the market.

A recent study by Actix, a leader in mobile network analytics, shows that the majority of traffic is indoors<sup>7</sup>. It found that 95% of iPad usage is indoors, whilst 90% of traffic from the iPhone 4 and 80% from Blackberry devices is from indoor use. Therefore, as The Netherlands is the most densely populated large country in Europe, having low frequency spectrum to provide quality coverage deep within buildings is critical for KPN to be able to offer a consistently high quality mobile broadband experience, irrespective of the location.

It is also important that a market leader in both the consumer and business markets has a substantial amount of spectrum available in low frequency bands. As Figure 4.2 illustrates, high frequency licenses cannot be used to cover as great an area as low frequency licenses, and therefore cannot provide capacity deep within buildings or in rural areas. Given the strong recent growth in mobile broadband traffic, which is forecast to continue, operators must have sufficient low frequency spectrum to meet traffic demand from these locations. In the context of a 4G LTE network, it was critical for KPN to acquire two 2x5MHz licenses in the 800MHz band.

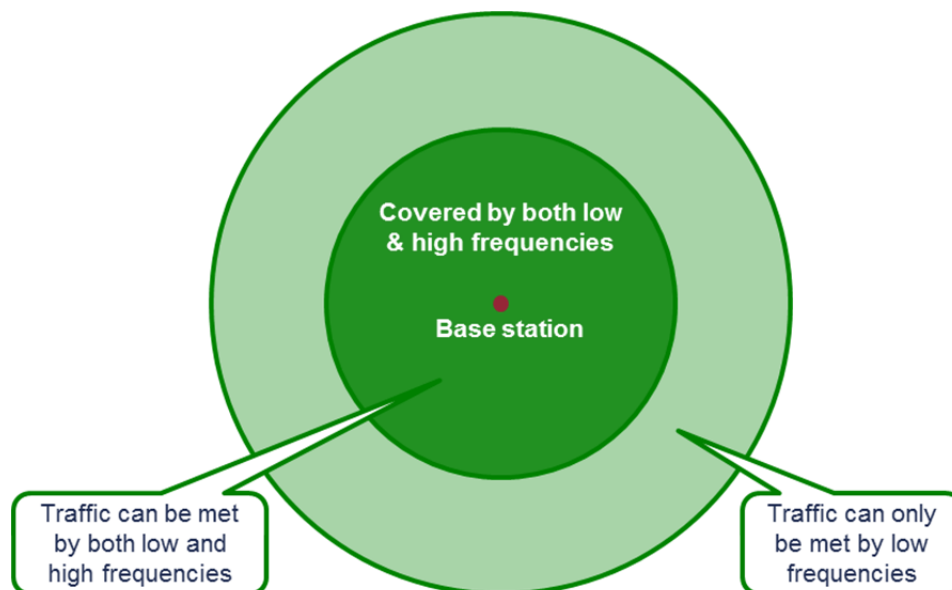


Figure 4.2 Low and high frequency coverage in a simplified cell

<sup>7</sup> Source: <http://www.actix.com/blog/actix-study-ipad-and-smartphone-usage-3g-networks-reveals-way-we-use-mobile-devices-changing/index.html>

#### **4.3 Implications for KPN's spectrum requirements**

Given these band characteristics and KPN's existing holdings in the 2.1GHz and 2.6GHz bands, KPN aimed to acquire the following spectrum:

- 4G LTE: substantial low frequency spectrum (800MHz) to provide nationwide LTE services indoors, and high frequency spectrum (1800MHz and 2.6GHz TDD) for capacity purposes
- 3G (HSPA): low frequency spectrum (900MHz) to extend its current mobile broadband service to nationwide coverage. This will complement KPN's existing 2.1GHz holdings. High frequency spectrum (2.1GHz) to extend the existing KPN footprint in this frequency band
- 2G (GSM): low frequency spectrum (900MHz) to maintain its current voice coverage levels and high frequency spectrum (1800MHz) for capacity purposes

Notably, given the future importance of 4G LTE and KPN's market leading positions in the consumer and business market, it was critical that KPN acquired two 2x5MHz licenses in the 800MHz band.

## 5 Auction outcome

The outcome of the auction was as follows:

	800MHz	900MHz	1800MHz	1.9GHz	2.1GHz	2.6GHz	Total MHz	Total paid
<b>KPN</b>	2x10MHz	2x10MHz	2x20MHz	-	2x5MHz	30MHz	120MHz	€ 1,352m
<b>Vodafone</b>	2x10MHz	2x10MHz	2x20MHz	-	2x5MHz	-	90MHz	€ 1,381m
<b>T-Mobile</b>	-	2x15MHz	2x30MHz	14.7MHz	-	25MHz	129.7MHz	€ 911m
<b>Tele2</b>	2x10MHz	-	-	-	-	-	20MHz	€ 161m

Table 5.1 Spectrum acquired and prices paid by bidder

	800MHz	900MHz	1800MHz	1.9GHz	2.1GHz	2.6GHz	Total MHz	Price per MHz
<b>KPN</b>	2x10MHz	2x10MHz	2x20MHz	-	2x5MHz	30MHz	120MHz	€ 11.3m
<b>Vodafone</b>	2x10MHz	2x10MHz	2x20MHz	-	2x5MHz	-	90MHz	€ 15.3m
<b>T-Mobile</b>		2x15MHz	2x30MHz	14.7MHz	-	25MHz	129.7MHz	€ 7.0m
<b>Tele2</b>	2x10MHz	-	-	-	-	-	20MHz	€ 8.1m

Table 5.2 Spectrum acquired and prices paid per MHz

KPN is pleased with the spectrum package it acquired in the auction. Its total spectrum holdings have increased from 119.8MHz to 174.6MHz, an increase of 46%. KPN believes that the acquired spectrum will provide significant commercial advantages in both the consumer as well as the business market.

The auction result means that KPN remains the only integrated access provider in the Dutch consumer and business market, offering the highest quality services through a combination of its own 4G LTE network and its hybrid copper and fiber infrastructure.

The 800MHz licenses will enable KPN to offer consistently high quality 4G LTE nationwide regardless of location, including deep within buildings. This will provide KPN with a crucial competitive advantage within the mobile broadband market.

The highly valuable spectrum is a vital strategic investment for KPN and is valid for 17 years, which will enable KPN to continue offering the highest quality of mobile services to its customers. KPN is convinced that the acquired licenses will generate a good return on investment.



### 5.1 Services to be offered by KPN going forward

The spectrum package acquired by KPN meets all of the objectives described earlier. KPN has acquired the most attractive portfolio of spectrum for each of its mobile networks (2G (GSM), 3G (HSPA) and 4G LTE), as well as to accommodate the future mobile data demand of its customers.

#### ***Clear roadmap for 4G LTE roll-out***

The 800MHz, 1800MHz and 2.6GHz TDD licenses acquired will allow KPN to roll-out the next generation 4G LTE mobile technology and introduce 4G LTE mobile broadband services. KPN will introduce 4G LTE services as soon as February 2013 and expects to have covered approximately 50% of the Dutch population by mid-2013 and nationwide 4G LTE coverage in the second half of 2014. KPN has already started mobile network upgrades to enable LTE, and only limited additional cost and time is required to implement the roll-out.

The high population density of The Netherlands, combined with KPN's dense site grid, allows KPN to offer 4G LTE services nationwide using a combination of the 800MHz, 1800MHz and 2.6GHz TDD bands. Although propagation in the 1800MHz band is less than for 800MHz, the 1800MHz band is very important for LTE in Europe, and is available on a number of key flagship devices such as Apple's iPhone 5, Samsung's Galaxy S3 and Nokia's Lumia 920. The higher frequency 1800MHz and 2.6GHz TDD bands also provide additional capacity to its 4G LTE network to sustain the highest quality at peak times and in high-usage locations.

Crucially, KPN succeeded in acquiring two licenses in the 800MHz band, enabling it to extend its high quality nationwide 4G LTE coverage into deep indoor and rural environments. This means that the user experience will be consistent regardless of location, be it outdoors or indoors, urban or rural. Without 800MHz licenses, customers would experience a marked drop in the quality of mobile broadband speeds whilst indoors or in rural areas. 4G LTE services will provide our customers significantly faster speeds than currently available over a 3G network.

The acquisitions of 800MHz, 1800MHz and 2.6GHz TDD licenses means that KPN has spectrum available in all mainstream 4G LTE bands to cope with all 4G traffic even in the locations of highest demand, also in the longer term.

#### ***Maintain leading position in other technologies***

In the short-term HSPA will be the primary mobile broadband technology and KPN's existing leadership in this technology is strengthened by its acquisition of two 900MHz licenses and one 2.1GHz license.

The 900MHz licenses will allow KPN to extend its 3G (HSPA) coverage to a level equal to that of its voice network. This will be the best coverage mobile broadband network in The Netherlands. In the longer term, voice services will be fully transitioned to 3G (HSPA) and 4G (using VoLTE<sup>8</sup>). The 2G

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<sup>8</sup> Voice over LTE

(GSM) network will be phased out, thereby freeing up the 900MHz licenses which may either be combined to offer even faster (multi-carrier) 3G services or used to offer LTE-Advanced services.

The 2x5MHz license acquired in the 2.1GHz band will add to KPN's existing holdings in that band (2x15MHz). This will increase the capacity of KPN's 3G (HSPA) network, ensuring that it can offer the highest quality 3G services. As it already uses frequencies in this band, KPN's network and the 3G devices owned by KPN's customers will be supported by the use of this additional license.

KPN currently offers the highest quality voice services. Its 2G (GSM) network has the best coverage in The Netherlands. Having acquired two 900MHz licenses means that KPN can continue to operate its 2G (GSM) network without interruptions to its market leading services. Therefore KPN will continue to operate and strengthen the best quality voice network for the foreseeable future.

## **5.2 Reserved spectrum implications**

The Dutch government reserved two licenses of 2x5MHz in the 800MHz band for new entrants. The 800MHz spectrum reservation enabled Tele2 to acquire two licenses of 800MHz spectrum to add to 2x20MHz of existing licenses in the 2.6GHz band.

KPN is an integrated fixed and mobile operator with market leading positions in both the consumer as well as the business market. KPN is the only mobile operator in the Dutch market with a complete portfolio of 4G LTE licenses through its 800MHz, 1800MHz and 2.6GHz spectrum holdings and will therefore continue to offer the highest quality data network. With its 900MHz and 1800MHz licenses, KPN will also continue to offer the best quality voice network. This will enable KPN to offer its customers the highest quality of integrated fixed and mobile services.

KPN views the Dutch mobile market as already highly competitive and well segmented. There are very low cost SIM only offers in the value for money segment and flat fee propositions for the high value segments. Furthermore, the Dutch MVNO market is very well developed with more than 50 MVNOs covering many different (niche) segments with attractive offers. KPN deploys a multi-brand strategy in The Netherlands to target the different market segments through its diverse range of brands. In 2012, KPN introduced simplified, flexible and transparent propositions for its main brands, KPN, Hi and Telfort. This was an important step in reinforcing the brand positioning to capture all market segments and adjust to rapidly changing customer behaviour.

Overall, we believe that the Dutch mobile market is highly competitive, and retail consumers and business customers already benefit from being able to choose between multiple service providers with competing propositions in all the major market segments.

### 5.3 Comparison of the auction result to international benchmarks

KPN's spectrum holdings following the auction are consistent with the holdings of market leaders in other major European countries that have had recent spectrum auctions.

Country	Operator	800MHz	900MHz	1800MHz	2.1GHz	2.6GHz (FDD)	2.6GHz (TDD)	Low freq. spectrum	High freq. spectrum
Netherlands	KPN	2x10	2x10	2x20	2x19.8 1x5	2x10	30	40	134.6
France	Orange	2x10	2x10	2x24	2x19.6	2x20	-	40	127.2
Germany	T-Mobile	2x10	2x12.4	2x20	2x9.9 1x5	2x20	5	44.8	109.8
Italy	TIM	2x10	2x9.8	2x15	2x15	2x15	-	39.6	90
Spain	Movistar	2x10	2x9.8	2x20	2x14.8	2x20	-	39.6	109.6
Ireland	Vodafone	2x10	2x10	2x25	2x15	-	-	40	80

*Table 5.3 Spectrum holdings of market leaders in major European countries (MHz)*

The above table illustrates that, like other European market leaders, KPN has access to a balanced and appropriate amount of low and high frequency spectrum. Crucially, it has access to 2x20MHz of sub-1GHz spectrum, which provides sufficient capacity nationwide and deep indoors resulting in consumers and business customers receiving the highest quality of services regardless of their location.

Table 5.4 below compares the price paid by KPN, Vodafone and T-Mobile to winners of large packages in other recent European auctions. Note that we have only included operators in other countries that acquired 800MHz spectrum, as this band represented a significant proportion of the price.

Country	Operator	Entrant reservation	Auction format	800MHz	900MHz	1800 MHz	1900MHz (TDD)	2.1GHz	2.6GHz (TDD)	2.6GHz	Total MHz	Scaled price paid <sup>9</sup>
NL	KPN	Yes	CCA	2x10	2x10	2x20		2x5	1x30		120	1,352
NL	Vodafone	Yes	CCA	2x10	2x10	2x20		2x5			90	1,381
NL	T-Mobile	Yes	CCA	-	2x15	2x30	14.7		1x25		130	911
IE	Vodafone	No	CCA	2x10	2x10	2x25					90	635
IE	Eircom	No	CCA	2x10	2x10	2x15					70	572
IE	O2	No	CCA	2x10	2x10	2x15					70	493
CH	Orange	No	CCA	2x10	2x5	2x25		2x20		2x20	160	271
CH	Sunrise	No	CCA	2x10	2x15	2x20		2x10		2x25	160	843
CH	Swisscom	No	CCA	2x10	2x15	2x30		2x30	1x45	2x20	255	630
DE	O2	No	SMRA	2x10			1x19	2x5	1x10	2x20	99	282
DE	T-Mobile	No	SMRA	2x10		2x15			1x5	2x20	95	265
DE	Vodafone	No	SMRA	2x10				2x5	1x25	2x20	95	291
DE	E-Plus	No	SMRA			2x10		2x10	1x10	2x10	70	58
ES	Orange	No	SMRA	2x10	2x5				1x10	2x20	80	201
ES	Telefonica	No	SMRA	2x10						2x20	60	176
ES	Vodafone	No	SMRA	2x10					1x20	2x20	80	186
IT	Telecom-Italia	No	SMRA	2x10		2x5				2x15	60	347
IT	Vodafone	No	SMRA	2x10		2x5				2x15	60	347
IT	Wind	No	SMRA	2x10						2x20	60	309
PT	Optimus	No	SMRA	2x10		2x14				2x20	88	178
PT	TMN	No	SMRA	2x10		2x14				2x20	88	178
PT	Vodafone	No	SMRA	2x10	2x5	2x14			1x25	2x20	123	230

Table 5.4 Spectrum acquired (MHz) and prices paid by bidder in recent European multiband auctions

The above table shows that the prices paid in the Dutch auction were high compared to the other auctions across Europe. A large contributor to this was the reservation in the 800MHz band creating artificial scarcity, which drove up the price of the critical 800MHz licenses.

<sup>9</sup> Prices are in millions of Euro. Prices paid in foreign countries are scaled to the population of The Netherlands and converted into Euros where necessary.

## Annex A. KPN spectrum holdings

### Pre-auction

Frequency band	Bandwidth	expiry	Included in auction
900MHz	2x12.4MHz	25 Feb 2013	Yes
1800MHz	2x20MHz	25 Feb 2013	Yes
2.1GHz	2x14.8MHz	31 Dec 2016	No
2.1GHz (TDD)	1x5MHz	31 Dec 2016	No
2.6GHz	2x10MHz	11 May 2030	No

### Post-auction

Frequency band	Bandwidth	expiry
800MHz	2x10MHz	11 May 2030
900MHz	2x10MHz	11 May 2030 <sup>10</sup>
1800MHz	2x20MHz	11 May 2030 <sup>11</sup>
2.1GHz	2x19.8MHz	31 Dec 2016
2.1GHz (TDD)	5MHz	31 Dec 2016
2.6GHz	2x10MHz	11 May 2030
2.6GHz (TDD)	30MHz	11 May 2030

<sup>10</sup> Assuming existing licenses are not extended.

## **Annex B. Auction format**

The auction format used for the Dutch spectrum auction was a combinatorial clock auction (CCA), similar to the format used for the 2.6GHz auction in 2010 as well as in a number of other countries (e.g. Ireland and Switzerland). The auction included two stages, an allocation stage (with two phases known as the primary and supplementary rounds) and an assignment stage.

- The allocation stage determined how many licenses each bidder acquired in each band. The primary rounds followed a 'clock' format, in which the prices of licenses in each band were increased each round and bidders stated the number of licenses demanded at those prices. In the subsequent supplementary round bidders could submit additional bids for all combinations of packages they wanted
- The assignment stage determined the specific frequencies of the licenses acquired by each bidder in the respective bands

## Annex C. Coverage obligations

The licenses in each frequency band have an associated coverage obligation:

Frequency band	License	After 2 years per license (in km <sup>2</sup> )	After 5 years per license (in km <sup>2</sup> )
800MHz	2x5MHz	308	7,471
900MHz	2x5MHz	257	2,567
1800MHz	2x5MHz	37	367
1.9GHz (TDD)	14.8MHz	28	28
2.1GHz	2x5MHz	28	N/A
2.6GHz (TDD)	5MHz	20	200

The license owners must offer a commercial service to the above specified areas by the specified period after the start of the license. The below table provides the roll-out obligations (in % of The Netherlands). The Netherlands has a surface of 41,500 km<sup>2</sup> (incl. inland water surface).

Frequency band	License	After 2 years per license (%)	After 5 years per license (%)
800MHz	2x5MHz	0.7%	18%
900MHz	2x5MHz	0.6%	6.2%
1800MHz	2x5MHz	0.09%	0.9%
1.9GHz (TDD)	14.8MHz	0.07%	0.1%
2.1GHz	2x5MHz	0.07%	N/A
2.6GHz (TDD)	5MHz	0.05%	0.5%