



Maximizing Return with WiMAX in a Highly Competitive Market

The Company

Danske Telecom* has its headquarters in Copenhagen. With its considerable nationwide spectrum holdings in the 3.5 GHz band, Danske Telecom has deployed a WiMAX network comprising 72 base station sites in 7 cities. Broadband services were launched in Denmark's three largest cities, Copenhagen, Aarhus, and Odense in October of 2005. By mid February 2008 Danske Telecom had extended coverage to 7 cities covering more than 550,000 Danish households and about 40% of the population.

With its deployment the company has elected to focus on high density urban areas despite the fact that these areas have the stiffest competition from incumbent DSL operators. This choice was based on:

- Denmark's population is trending towards the cities
- Gaining a higher number of customers per site results in a faster payback

Although DSL has the dominant broadband market share in Denmark, Danske Telecom is capturing more than 16% of new broadband subscribers within its WiMAX coverage area. Danske Telecom's subscribers currently total 13,500.

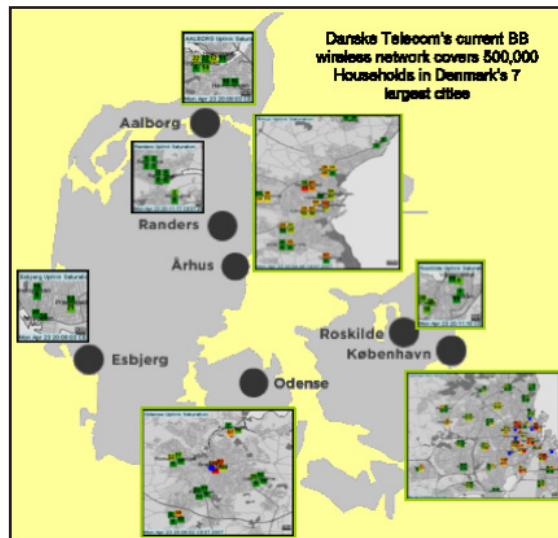
Danske Telecom's spectrum holdings for WiMAX deployment total two nationwide licenses in the 3.5 GHz band each with two paired 28 MHz channels for a total of 112 MHz of spectrum. Additional spectrum holdings include licenses in the 3.6 GHz, 10.5 GHz, and 26 GHz bands.

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These bands provide ample spectrum for wireless backhaul connections and for high capacity point-to-point links to meet the capacity requirements for large businesses. Danske Telecom's nationwide fiber network adds a further dimension to its capability.

WiMAX Broadband Services Offered

Danske Telecom's focus is on both the business and consumer markets. The service offering includes various plans with monthly costs commensurate with download and upload speeds. While Danske Telecom's emphasis is on broadband internet access, VoIP options are provided through agreements with third parties. Typical consumer pricing options range from 99 Krone (~\$15 USD) per month for 1 Mbps download speed to 199 Krone (~\$30 USD) per month for 3 Mbps. Danske Telecom has found that aggressive pricing is a key factor in winning consumer market share from competing incumbent DSL operators.



Tariffs for business customer are higher. At present consumers account for about 90% of the traffic volume and about 80% of Danske Telecom's revenue.

Services are offered under the Danske Telecom brand and the large majority of new customers signup for services and purchase modems online, having been directed to the appropriate site through targeted media campaigns. Online customer acquisition together with plug and play modems and over the air provisioning helps to keep the cost per gross customer add to a minimum.

The End-to-End Network

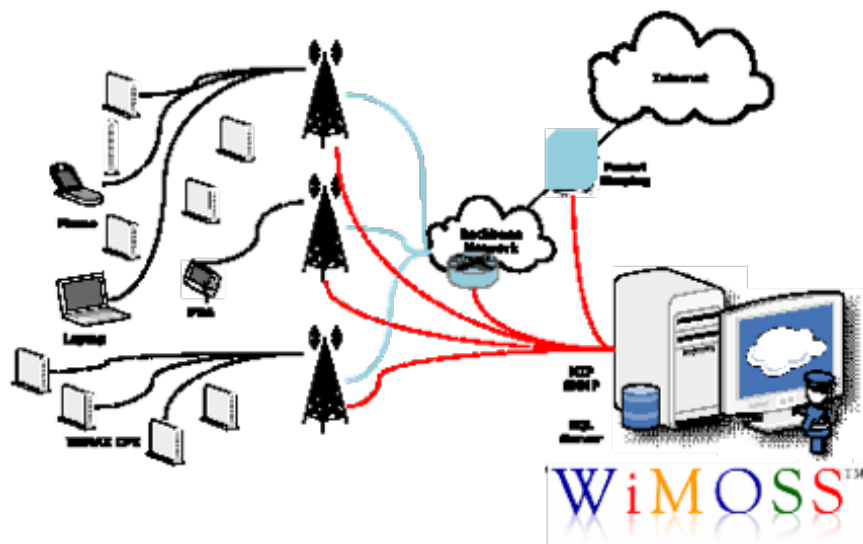
With its own nationwide fiber network and additional spectrum licenses in the 3.6 GHz, 10.5 GHz, and 26 GHz bands, Danske Telecom has adequate spectrum resources to further enhance revenues by providing dedicated links for larger businesses with high capacity demands. Dedicated point-to-point or fiber links are used to provide business connections with up to 100 Mbps of symmetrical service.

Backhaul connections for the WiMAX network vary in accordance with the traffic load and the strategic importance of the site. Base station sites with a large number of customers may have a fiber backhaul connection together with one or two point-to-point wireless connections for redundancy should one of the links fail. Sites with relatively few customers may only have a single wireless backhaul connection. With Danske Telecom's in-house 24/7 network management facility,

any network malfunctions are immediately detected and addressed.

WiMOSS™ is another key element in the Danske Telecom network. This is a broadband traffic management software tool that enables the monitoring of network traffic including, modulation, interference, and user behavior. One of the things that Danske Telecom has discovered is that 5% of heavy use customers during peak periods can create a poor user experience for the other 95%. WiMOSS provides the capability tracking this activity in close to real-time and automatically cap the usage for the heavy users during peak-hours if and only if the sector of the heavy user is saturated so as to ensure good service to the other users. This approach helps to reduce customer complaint calls and reduces churn. It also provides a means for optimizing spectral utilization and maximizing sector capacity to help ensure that large investments in adding network capacity are only made when necessary; another key component in the effort to maximize the return on investment.

Danske Telecom has decided to offer WiMOSS to other WiMAX operators, currently with deployments in North and Central America, Caribbean, Africa, and Europe.



Market Opportunity and Company Vision

According to the Organization of Economic Cooperation and Development (OECD), Denmark, with a population of approximately 5.5 million, already has one of the highest broadband penetrations in the world. This would not appear to be an attractive business environment for a new broadband operator with a new access technology. Nevertheless, Danske Telecom has in just a few years demonstrated that with the right technology and a business approach that is focused on the customer experience, it can be successful in this highly competitive environment.

Danske Telecom deployed its broadband wireless access network with pre WiMAX- certified equipment based on the Motorola Expedience platform. This enabled Danske Telecom to quickly gain a market presence in the offering of fixed broadband services. Now with the availability of WiMAX-certified equipment based on the 802.16e-2005 standard, Danske Telecom is looking at further network expansion that will also support mobile services.

Geographically, Danske Telecom intends to continue its focus on the larger cities adding new sites as necessary to address the capacity requirements of a growing customer base.

The WiMOSS traffic management tool will continue to be an important factor for Danske Telecom's business case. The results attributed to the use of this management tool so far include:

- Ten times reduction in customer support expense
- Two times higher revenue per base station
- Interference levels reduced by more than 70%
- Need for additional capacity rollout pushed out by 6 months
- Higher customer satisfaction leading to reduced churn

Customer Experience

Danske Telecom's traffic management, competitive pricing, and attention to customer satisfaction have certainly paid off. In recent customer surveys more than 98% of surveyed customers indicated that they would recommend service to a friend and Danske Telecom's customer service rated 4.3 out of 5.

WiMOSS™ is also being well received by other WiMAX operators as evidenced by the following statement by an operator in North America:

"The results are wonderful It's a tool tailored for the need of a wireless operator like us"

Don Hamel, Network Operations Manager SpeedNet LLC. Saginaw Michigan, USA

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January, 27th 2009

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