Executive Summary

- **Competition shifts from individual services to Triple Play**
  Today, television cable as well as DSL are in a position to offer TV, Internet and telephony as a product bundle ("Triple Play"). Thus, for the first time, direct competition ensues between these infrastructures. Throughout Europe, the Triple Play market will grow rapidly, increasing from the current €0.7 billion to approximately €7.5 billion by 2010, reflecting a tenfold increase.

- **TV-over-DSL will be utilized by approximately 1.4 million German households by 2010**
  In the near future, the largest German infrastructure-based DSL providers will be aggressively marketing and offering DSL television. However, in contrast to other European countries, the market potential is limited by the structure of the TV market.

- **TV cable goes Triple Play: 1.6 million German broadband Internet customers by 2010**
  Cable television is facing an impending growth spurt. Due to accelerated upgrading of the networks, cable will have achieved a 9% market share of broadband households by 2010.

Infrastructures platforms are breaking ground in new product territories

<table>
<thead>
<tr>
<th>TV</th>
<th>Analogue TV &amp; Radio</th>
<th>Satellite</th>
<th>DSL</th>
<th>DTT</th>
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<tbody>
<tr>
<td>Digital Basic TV &amp; Radio</td>
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<tr>
<td>Basic Pay-TV</td>
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<td>Premium Pay-TV</td>
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<td>VoD / PPV</td>
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<td>HDTV</td>
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<td>PVR</td>
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<tr>
<td>VoD</td>
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<tr>
<td>High Speed Internet</td>
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<tr>
<td>Broadband Content Portal</td>
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<tr>
<td>Internet</td>
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<tr>
<td>Basic Telephone Service</td>
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</tr>
<tr>
<td>Telephony</td>
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<tr>
<td>Mobile</td>
<td></td>
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<td></td>
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<tr>
<td>(Basic, Home Zone)</td>
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</tbody>
</table>

Source: Solon
“War of Platforms”

“Television via Internet”, "high-speed Internet via television cable", “Voice-over-IP”, “Internet via mobile networks” – the operators of various broadband infrastructures (television cable, DSL, UMTS) are advancing into new domains and creating competition for one another. “VoIP”, “Triple Play” and “IP Television” are the buzz words of the day and, in part, are already complemented by mobile services towards “Quadruple Play”.

Triple Play, that is the bundled offering of television, Internet and telephony, is the providers’ goal. They have already positioned themselves: on the one hand, television cable operators such as Kabel Deutschland and ish are now also offering internet and telephony services and, on the other hand, classic telephone network operators such as Deutsche Telekom and Arcor are now offering television products. Even mobile network operators are moving towards Triple Play. However, mobile networks are focusing on mobile television. Due to the limited bandwidth of their networks, they are unable to offer programming suitable for home viewing. Satellite and DVB-T are also ultimately limited by their infrastructure, which does not provide for two-way capability, thus making advancements towards Triple Play over their own networks impossible.

By expanding their service portfolios to include telephony and Internet, cable operators are going after a market ten times the size of their TV market. Thus, in Germany, in terms of absolute numbers, ex-monopolist Deutsche Telekom (DTAG) is in a far more precarious position than the cable operators. Even in relative terms, cable operators have the greater potential. Their expansion is towards two services that generate significantly higher average revenues than TV access fees. Deutsche Telekom, however, is only adding one service, TV, which generates a much lower average revenue and is also associated with minimal customer willingness to change services.

Triple Play offers the customer significant advantages: in addition to providing one invoice and one customer service contact, the most important issue is the significant price break. For example, alternative DSL providers enjoy a cost advantage if they include telephony in their offerings. In that case, they rent the entire customer access line from the ex-monopolist instead of renting just the shared line, and pass their cost savings on to the customer. Therefore, the product bundle becomes less expensive than an individual product, the customer is only required to pay one basic fee that is lower than the two fees he paid before.

Source: Solon

Market size Germany 2004 (bn €) * incl. Business customers

<table>
<thead>
<tr>
<th>Infrastructures / Platforms (Example - Germany)</th>
<th>Cable</th>
<th>DSL</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephony</td>
<td>VoIP</td>
<td>VoIP</td>
<td></td>
</tr>
<tr>
<td>Broadband Internet</td>
<td>ULL</td>
<td>ULL</td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td>IP-TV</td>
<td>IP-TV</td>
<td></td>
</tr>
<tr>
<td>Full Triple Play-potential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited potential Focus on mobility</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cable: Largest potential</td>
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<tr>
<td>Monopolists on the defense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed line*</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile*</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSL</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable: Premier</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premiere</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Solon
In the case of Triple Play via television cable, the price break is even greater: here, the customer may terminate both, the DSL and the old telephony service. Since cable operators own their infrastructure, they do not need to pay rent to ex-monopolists. Thereby, they are in a position to offer even lower prices than alternative telecommunication operators that must rent copper customer access lines from the DTAG ("ULL operators\(^1\)").

Therefore, the products and necessary infrastructures are not the central players in this market dynamic. It's all about bundling products, beating competitors in price and/or offering the best product features.

Above all, the main issue revolves around who will dominate the future Triple Play market. Since a prerequisite for Triple Play is broadband Internet access, this will be the key to people’s future telecommunication and media services.

**First comes broadband access, then the upselling of new products**

Currently all electronic telecommunication and media products – including television – are developing into an “all IP” world.

**Internet** is a commodity, being utilized more and more frequently and extensively.

**Telephony** will completely migrate towards IP in the long-run. The first indications of this are everywhere: many of the large telecommunication companies are offering VoIP for private household use. Today, however, a DSL customer must maintain his or her telephone service. Additionally, since normal per minute charges are already very low, the end customers would only receive a minimum price break were they to telephone via VoIP instead of via DSL. Therefore, although marketing efforts have been intensified significantly, current penetration is still limited.

**IP-TV** has developed from PC puppet theater to a highly desirable product with quality standards comparable to that of the DVD. Attractive product features include:

- Transmission of many digital channels, e.g. small niche channels\(^2\)
- Extensive TV programming from the Internet to the TV screen
- Full Video-on-Demand (VoD) including large video library for all customers
- Network-based recording (PVR\(^3\)), e.g. with automatic "replay" possibilities\(^4\)
- Virtual channels (the ability to rewind and forward within a television program)
- Interactive television (betting / voting, additional info, etc.)

IP-TV has made it possible for personalized television consumption to reach a level of perfection. A good example for personalized television is the PVR that is currently entering the living room space. However, IP-TV goes further: it seamlessly merges “lean back” consumption and interactive possibilities on one single platform, thus offering a fascinating new style of TV consumption.

Today, IP-TV is already being utilized over DSL ("TV-over-DSL") in many European countries by an ever-growing customer base of now approximately 500,000 subscribers. In Germany, it is being offered as VoD service on the basis of DSL (e.g. T-Online, Arco, Hansenet/Alice).

**Convergence products** are a distinguishing feature of the ongoing development. They are at the interface between telephony, Internet and TV, and are only truly feasible on an “all IP” service platform.

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\(^1\) ULL: "unbundled local loop", meaning the "naked" telephone line to the customer.

\(^2\) With DSL, only the "last mile" is limited; i.e. only one channel is broadcast over the copper line - the one channel that is currently selected. On the backbone, a practically unlimited number of channels can be broadcast.

\(^3\) PVR: Personal Video Recorder

\(^4\) Replay enables customers to watch programming that has already aired, without having to personally record such programming.
Examples of convergence products are: receiving TV program information from the Internet to the TV screen, surfing the Internet on the television console, managing telephone numbers via the PC, displaying caller ID numbers on the television screen, sending emails when the individual is not reachable by phone, etc. These examples are not products of the future. They are services that are already established in other countries.

### Triple Play is the convergence of Telephony, Internet and Television

**2000 - 2003**
- **Telephony**: Massive price decline
  - New operators resulting from liberalisation of telecom. market
  - Call-by-call / Preselection

**2004 - 2005**
- **Converg. Telephony / Internet**
  - VoIP (Voice-over-IP)
  - Inexpensive bundles DSL / ISDN
- **Converg. Internet / TV**
  - VoD-over-DSL
  - Multimedia PC in the living room

**2006 ff**
- **Converg. Telephony / Internet**
  - VoIP suitable for everyday use (combination with bluetooth / WLAN, ISDN, GSM)
- **Converg. Telephony / Broadband Internet / TV**
  - Internet via the TV console
  - TV-over-DSL (VoD, Broadcast, iTV)
  - “More” TV (3)
- **Converg. Internet / TV**
  - Internet via the TV console
  - TV-over-DSL (VoD, Broadcast, iTV)
  - “More” TV (3)

**Convergence products are becoming an integral part of the product world**

### The European Broadband Market: Rapid Growth

The European broadband market has entered a phase of rapid growth. Today, on average, one out of every four Western European households utilizes high-speed internet access. Three factors accelerate broadband growth:

- **Increased Internet use.** As a result of widely utilized multi-media content (MP3, videos, etc.), the added value of convenient broadband access has increased, as has customer demand.

- **Decreasing prices of DSL preliminary products** and the possibility of DSL resale. Changes of the framework conditions were enforced by regulatory authorities. They significantly increased the potential for alternative DSL providers, thereby intensifying competition.

- **Sinking prices for the end customer** resulting from increased competition lead to new customer segments being opened up to the market, above all in the narrowband sector (ISDN, analog telephone).

However, an essential factor in broadband penetration is the competition between telephone and cable network platforms. Countries in which television cable networks underwent early upgrades to include two-way capability (“cable markets”) typically have a significantly higher broadband penetration than primarily DSL-dominated markets (“DSL markets”).

In “cable markets” such as Great Britain, Sweden and the Netherlands, early competition between both cable and DSL platforms led to stronger market penetration. In these
countries, television cable was modernized years ago, meaning that it was fully developed for interactivity.

**Broadband penetration 2004 (%)**

<table>
<thead>
<tr>
<th>Cable markets</th>
<th>DSL markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets with nationwide broadband Internet offerings</td>
<td>Markets without nationwide broadband Internet offerings</td>
</tr>
<tr>
<td>Kabel</td>
<td>DSL</td>
</tr>
<tr>
<td>NL</td>
<td>CH</td>
</tr>
<tr>
<td>45%</td>
<td>17%</td>
</tr>
<tr>
<td>41%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Source: OECD, Solon, Company information

The cable networks in the “DSL markets” either did not undergo area-wide upgrades or had only limited cable penetration from the very beginning. Therefore, ex-monopolists dominated the DSL market for many years. Examples include Germany, France, Italy and Spain. It was only until the regulatory framework was adjusted that the competitive situation changed. Thus in Germany by the year 2004, the regulating authorities lowered certain vital prices for DSL preliminary products, and forced the ex-monopolist, Deutsche Telekom, to allow other ISPs to resale DSL.

The prices throughout Europe for broadband Internet have dramatically fallen in the past two years – this trend will continue throughout 2005.

**DSL ARPU in Europe 2003 – 2008 (€ / month)**

![Graph showing DSL ARPU trends](image)

Source: ABN Amro 2004, Solon

Due to extremely intense competition, France has the lowest prices. These prices will thus no longer decline, since the marginal limits have already - in part - been reached (example: Iliad). Germany finally experienced a strong price decline in 2004 as a result of regulation and increased competition⁵. However, this will not continue – on the one hand, many

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⁵ The price for a 1MBit/s-Flatrate (volume rate without DSL-connection, including VAT) went from € 29.95 (2002, DTAG) to € 4.99 (Reseller “gmx” rate in large cities). Total price (connection and volume flatrate) went from...
preliminary products are still very expensive (e.g. connecting/disconnecting DSL customers) and, on the other hand, the intense price competition seen over the last months has pushed German providers to their economic limits. Only in case of new regulative decisions, prices might continue its downward trend.

Even in countries such as Italy and Spain, intense competition has led to steep price declines. Various price levels are, above all, based on prices for DSL preliminary products and are partially influenced by oligopolistic circumstances (Netherlands).

Basically, broadband markets are experiencing a typical development: Markets move from a first phase, where DSL incumbents and cable operators roll-out their products nation wide, into a phase of increased growth. An increased rise in competition will then result in a rapid price decline and rising customer attrition. This forces providers to distinguish themselves from one another, which is considerably challenging when dealing with a highly-standardized product such as Internet connections. Many Western European markets are presently entering this phase of differentiation.

On the way to differentiation, European broadband markets are currently experiencing a phase of accelerated growth

![Diagram showing market development and time with phases of broadband roll-out, accelerated growth, differentiation, and consolidation.]

Source: Solon

Is differentiation the answer to declining prices?

Price competition and differentiation by implementing standard products such as TV are disadvantageous because other providers quickly follow. Thus price structures cannot experience a solid increase. Although revenues per subscriber have increased or have at least remained constant, the price per service decreases.

Revenue per customer and per service (schematic)

![Diagram showing revenue per customer and per service with phases of product introduction, competitor follow-up, and price decline.]

Source: Solon

€ 46.90 to € 21.90. The prices went down more than 50%.
Fastweb in Italy is an example of how ARPU rises despite tough competition. Fastweb, a product by the company eBiscom, began offering high-speed Internet in addition to TV in 2001. In doing so, a large part of the revenues was generated by additional services that other infrastructures such as VoD or videotelephony do not offer at the moment. Most DSL and cable operators could only dream of annual customer revenues of € 900.

The key to success: via Triple Play, closely-connected customers become increasingly used to attractive additional services and utilize them more and more. In the case of Fastweb, such services include, above all, various flatrate options and VoD. The intense willingness to utilize VoD can be seen most notably in the USA where VoD is the number one reason for lower churn and increased revenues per user.

Triple Play in Europe: DSL continues to dominate

Revenues generated by Triple Play offerings in Europe will keep rising to approximately €7.5 billion by 2010 and will continue to be dominated by DSL. This is due to the fact that, in the meantime, all large DSL providers (ex-monopolists and alternative infrastructure-based DSL operators) already either offer Triple Play bundles or currently find themselves undergoing a test phase. The cable networks are either still unequipped for area-wide interactivity or, in contrast to the telephone networks, do not yet cover all households.

**Market size of Triple Play in Western Europe** (in billions of Euros)

Compared to Telcos' voice revenues, the Triple Play market is quite small. In 2004 the Telcos generated revenues via private customers of approximately € 63 billion (for the above countries). Nevertheless, the current differentiation phase is critical to all market participants in order to be able to control a significant share of the broadband market in future. Only in case they control the broadband IP line into the households, up-selling towards Triple Play can be successful. And once the customer is bound by numerous services to the operator, other providers will always have a difficult time persuading the customer to switch over to them.

Once differentiation is exhausted – that is, price ranges are pushed to the limit and additional products or product characteristics are offered by the largest market participants – a powerful wave of consolidation starts. This typically results in a stable oligopoly of few, but large market participants. The first steps can be observed in the French marketplace (acquisition of Cegetel by neuf, purchase of Tiscali by Telecom Italia). However, in the German marketplace the “who’s next” attitude is also prevalent (since mid-2004: Berlikom by Versatel, Hansenet by Telecom Italia, Strato and Web.de by United Internet, Celox by QSC, Versatel by Apax). The sale of Arcor is being expected for the upcoming months…
German Market: Cable Internet and TV-over-DSL

Broadband market Germany

In the last two years, the broadband market in Germany did not undergo the same strong growth affecting the rest of Europe. Initially, Germany was on the cutting edge: already in 2000-2002, the DTAG refurbished its telephone networks with DSL equipment and mass-marketed the product. Due to the virtual monopoly position of the DTAG, high end-customer prices were able to establish themselves, thus smothering competition for a long time. The high costs of the DTAG preliminary products restricted the range of alternative DSL providers. In addition, as a result of the delayed sale of the cable networks, no true infrastructure competition emerged. The market segment of early adopters and followers with high willingness to pay was practically exhausted by 2003, and growth slowed down.

![Broadband penetration in select countries (\% of households)](image)

As described, in the meantime competition has intensified in many places. In Germany, growth will increase starting in 2006 through, among other reasons, the reinforced upgrading of the networks.

The German cable networks: a late start

After purchasing cable operators between 1999 and 2002, new investors in cable networks performed only limited upgrades. The investor Callahan carried out an incredibly cost-intensive upgrade to part of the NRW network and ended up in financial ruin. Afterwards, the enthusiasm of other companies planning to perform similar upgrades was severely curbed.

Another reason for the limited amount of cable Internet penetration in Germany is the historically-related separation of the cable business models into Level 3 (“NE3” – city networks, operated by the large cable providers) and Level 4 networks (“NE4” – local-area networks, often operated by homeowners or mid-sized companies). This separation results in the following problems:

- The core business of Level 3 and Level 4 providers involves competing for cable connections, partly against one another. Therefore, this makes a cooperation very difficult, especially when providers want to differentiate themselves from one another.

- Upgrade plans of the various operators are not coordinated. In places in which Level 3 networks are upgraded, oftentimes only a small part of the Level 4 network has two-way capability – and vice versa.

- Finally, Level 3 operators have only direct end customer relationships with half of the connected households, thus limiting the motivation to upgrade.
Since the end of 2003, cable companies have continued to upgrade their networks. The reasons for this are as follows:

- **Technology**: new technology results in network upgrades costing only 5-10% of what was estimated in 2001. Upgrades are also now completed in a fraction of the time that used to be required.

- **Level 4 networks**: from perfectionism to pragmatism. Today, in many cases, in-house networks no longer need to be rewired in order for cable Internet to be accessible in homes. Alternative technologies have also been developed, such as powerline technology via coaxial networks ("Coaxline"), which avoids having to upgrade very old in-house networks.

- **Marketing**: various new marketing and sales approaches have been successfully launched. One such example is a co-marketing model that bridges the crippling gap between NE3 and NE4 operators. Attractive offers for homeowners include, e.g. long-running contracts regarding installation and handling of modern in-house networks. The contracts provide all renters access to primary cable Internet in addition to TV. Due to the resulting appreciation value of their rental objects, homeowners also profit from the upgrades. Another marketing instrument developed by Kabel BW is the “Single Line”: rental parties interested in cable internet (and telephony) are connected to a transit station in the basement via one new cable. Since it becomes unnecessary to upgrade the entire in-house network, the cable operators’ risk is significantly reduced along with the overall investment.

In the last two years, Kabel BW has upgraded approximately 20% of connected households, i.s.h. has expanded Bonn’s city network, iesy (Hesse) recently upgraded the Frankfurt network and Kabel Deutschland has upgraded parts of Berlin, Munich, Hamburg and starts fully upgrading all cities in Rhineland-Palatinate and Saarland. Already in the mid-term, in other words, by the end of 2007, 40-45% of all connected households could have Level 3 Internet and telephony capabilities.

By the end of 2004, only 145,000 customers had cable internet in comparison to the 6.7 million DSL customers. The potential is indeed huge since cable operators (Level 3 and Level 4) have a – direct or indirect – reachable base of approximately 21 million households. Furthermore, with their product bundle of TV, Internet and telephony, they also have a significant price advantage over DSL. Once upgrades planned by cable operators are actually completed, cable will obtain a significant share of the DSL market. This will however take several years.

### Market share of Cable Internet in Germany (% of broadband households)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.9%</td>
<td>4.2%</td>
<td>6.0%</td>
<td>7.2%</td>
<td>8.0%</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

Source: Solon

Next to the necessary network upgrades, a prerequisite for the success of cable operators is, in particular, the roll-out of attractive products that go beyond the basic “cable

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6 Either they have already been upgraded, or even older networks are more and more often used in the state as they are – without upgrade

7 Source: RegTP
connection" product. Most notably, besides Internet and telephony, the digital TV product is the most crucial building block for Triple Play.

Should the private broadcasters also be made available via digital cable TV – not as an additional Pay TV channel, but rather as Free-TV\(^8\) – digital cable TV will have remarkable opportunities in the marketplace. Additional products such as HDTV, PVR and VoD would be quickly integrated into the market, based on these direct customer relationships. In terms of cross-selling and up-selling, Internet and telephony would also be marketed more effectively. The basis for such is an attractive product portfolio that is positioned more aggressively in the marketplace.

This leads to another challenge: cable operators have to develop from B2B organizations to B2C organizations with professional customer management. Companies that want to succeed in the Triple Play market must continuously develop, introduce and position new products in the market. The complex telecommunications and TV products of today already set very high demands in terms of marketing, sales and customer service. And requirements will become even more demanding…

German DSL market: TV-over-DSL is ready to go

After a phase of reduced growth between 2002 and 2003, the German DSL market picked up again in 2004. The current acceleration within the DSL market can be attributed mainly to a series of price reductions achieved by regulatory authorities. In parallel to the ongoing price war, providers started differentiating themselves from one another via increasingly large bandwidths and new service offerings.

**DSL Television** will be marketed aggressively in the course of 2005 or mid-2006 (football world championship 2006) at the very latest. Particularly, providers with their own infrastructure are expected to currently prepare the roll-out of IP-TV, they have partly published their position:

- T-Online already has a VoD offering (“T-Vision”), but it was not marketed very intensely. Faced with plans by competitors, it can be assumed that the product is currently undergoing further development. Together with the wide-spread roll-out of T-DSL 6000, it could soon be moving to the forefront, e.g. alongside distinctly less expensive set-top boxes. However, the current efforts of integrating T-Online into T-Com might delay the roll-out.
- Arcor and Hansenet (“Alice”) already offer VoD and have announced plans for further expansion.
- Versatel recently started to offer a complete DSL television product (including broadcast TV) in the Netherlands and has already acquired exclusive broadcast rights for soccer. A roll-out in Germany has been announced.
- Telefonica operates a high-capacity network in Germany and is currently expanding its DSL infrastructure with ADSL2+. Current Telefonica customers include business customers, carriers and ISPs such as AOL and MSN. Since the modern network will also support IP-TV, it should be assumed that customers such as AOL will also offer TV-over-DSL products.
- Premiere disclosed that they were currently reviewing TV-over-DSL. It is still unclear as to what extent their own infrastructure will be developed or how they will cooperate with partners – which is far more probable.

Taking all of this into account, the question of whether DSL television will be offered in Germany no longer exists, but rather the question with what success and what type of structure, when it breaks into the market. Pros and cons of a successful take-up are:

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\(^8\) Simulcast: simultaneous broadcast of a program in analog and digital form.
Factors in favor of TV-over-DSL

- Attractive product features
- Foreseeable intensive marketing by DSL operators, fast wide-spread network coverage of necessary equipment
- Attractive prices for Triple Play product bundles.

Factors against the success of TV-over-DSL

- Ambiguity as to whether the DSL providers will be allowed to transmit the most wide-spread Free TV channels (e.g. RTL, Pro7 / SAT1) over their networks. At the moment, even cable operators are not allowed to transmit these channels in digital form. This is partly due to contracts with production studios, but mostly due to broadcasters’ reluctance to become diluted in an ocean of numerous digital channels without inversing the existing business model, i.e. opening-up other revenue sources beyond advertisement.
- Large quantity of accessible television programming in Germany as well as – in comparison to the rest of Europe – low cost of television access
- There is limited willingness on the part of the customer to change services because a) they have already invested in satellite equipment, b) are not interested in a complete DSL television product (mainly users of terrestrial TV), or c) they are indirect cable customers (cable connection is deducted from added rent expenses paid to the landlord, thereby making the service impossible to terminate)
- TV platforms have to be installed and capacity upgrades for backbones have yet to be completed, which are very time-consuming efforts.

It can be assumed that in the medium-term, DSL providers will not be able to broadcast many of the most popular Free-TV channels. Thereby, the customer will not replace his or her primary TV connection with TV-over-DSL. Aside from that, the market potential for a complete TV-over-DSL product (broadcast and VoD via DSL) in Germany is still a lot lower than in other European countries. In Germany, the potential lies mainly among direct cable customers, who, however, make up less than 30% of the TV market.

That is why a different model will be more successful: Hybrid TV-over-DSL, a combination of the existing primary TV connection (cable, SAT, DVB-T) with DSL. The broadcast channels are received via the primary infrastructure and the customer utilizes DSL for interactive services (video on demand, Internet surfing, etc.). However, in order to be successful, all TV products must be made accessible to the customer via one single platform. That is, with one remote control, the customer chooses from a variety of TV channels that are supplied e.g. via cable, as well as e.g. VoD via DSL.

Taking all of this into account, it can be assumed that by the year 2010, approximately 1.4 million households will utilize TV-over-DSL. However, the service will be utilized as part of a hybrid TV connection, while retaining the existing primary receiver path⁹.

### TVoDSL – Customers in Germany (’000)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>65</td>
<td>175</td>
<td>380</td>
<td>750</td>
<td>1,400</td>
</tr>
</tbody>
</table>

Source: Solon

⁹ This potential was determined via a forecast model, which illustrated the TV and broadband market in depth.
Thereby, approximately 8% of the then 17.5 million DSL customers\textsuperscript{10} will use TV-over-DSL services via their television screen.

Expansion of cable towards Triple Play will become more difficult as a result of TV-over-DSL. Particularly, direct cable customers that use DSL may have yet another reason to switch over to DVB-T: cable connections may lose their desirability should the DVB-T product be complemented by DSL, e.g. by adding VoD features, niche channels, or Pay TV (e.g. Premiere).

However, most German cable operators are still in a better situation than their European neighbors since specific German framework conditions protect them from comparatively strong assaults by DSL providers.

**Conclusion**

In Western Europe, the "War of Platforms" is heavily under way, leading to lower prices, bundling packages, fascinating new products like IP-TV and new features resulting from the whole new world of convergence.

In Germany however, this rivalry between coax cable and copper based telecommunication operators will only exist in a limited way:

- The expansion potential of cable operators towards Internet and telephony will be restricted in the mid-term by limited upgrades as well as by operational issues and partially limited brand awareness.
- The market potential of DSL operators is reduced by the structure of a TV market characterized by small Pay TV penetration, a wide variety of Free TV channels and comparatively low TV access cost. In the long-term, their main focus will thus be on high-quality Pay TV and interactive TV services. There will be less of an emphasis on classic TV reception, which, as a result of hybrid solutions, will tend to remain in the hands of the current providers.

However, the restricted or delayed German "War of Platforms" should not make German cable fall back into a sleeping beauty-like slumber. Without the push towards new TV products and Triple Play, broadband cable will lose attractiveness in the long-term.

Already today we are seeing intense competition within the German DSL network providers. Responsibility for healthy competition lies with the regulators: attractive prices for unbundled access lines, Bitstream\textsuperscript{11}, and "naked DSL"\textsuperscript{12} products must include a range wide enough to allow differentiation between the various DSL operators. At the same time, DTAG and infrastructure-based DSL providers must have sufficient leeway for the future development of their networks from which, ultimately, all will profit.

\textsuperscript{10} Source: Goldman Sachs, Solon
\textsuperscript{11} Bitstream preliminary products give DSL providers access to technical and DSL infrastructures and enable them to offer products and/or quality features that would not be possible with a standard T-DSL connection.
\textsuperscript{12} A “naked DSL” connection allows customers to terminate their telephone connection service. Telephone services could be utilized via DSL (VoIP) or mobile phones. Many customers could profit from this arrangement since they would be saving on basic charges.
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Solon Management Consulting

Solon focuses on strategy consulting in the fields of media and telecommunications. From working with many clients, Solon has in-depth experience in the mobile and fixed line communication industry, and is the leading consultancy for the European cable TV industry. Services range from consulting on M&A projects to the development and implementation of corporate strategies. Clients include cable operators, telecommunication and media companies, banks and private equity funds.

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