Market survey

Bus-based installation technology in residential and commercial buildings

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Contents

Fachhochschule Südwestfalen
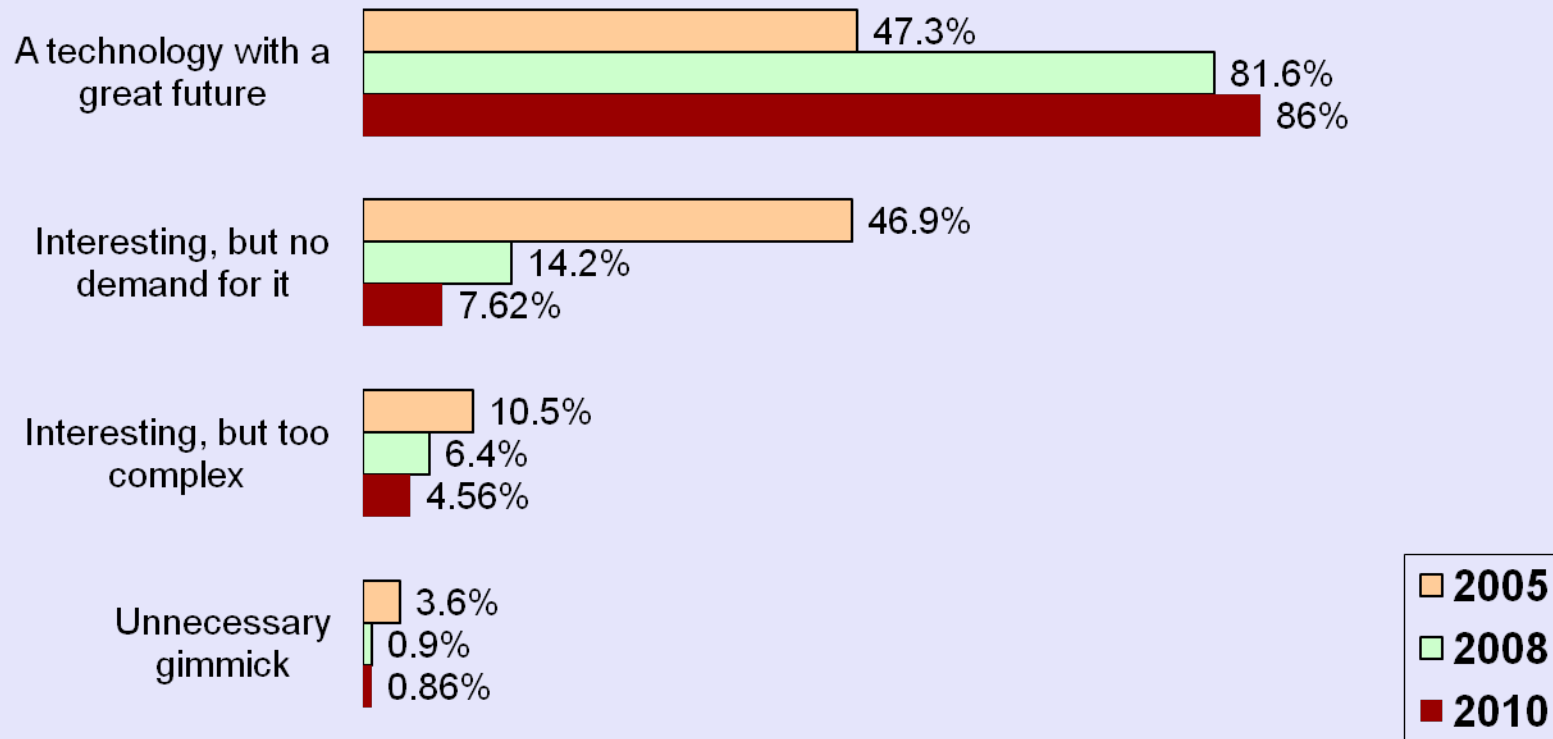Hochschule für Technik und Wirtschaft
University of Applied Sciences

Level of skill in/appraisal of bus technology

⇨ Appraisal of bus technology

⇨ Benefits of bus technology for the client

⇨ Companies' level of skill in bus technology

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Very generally, what is your opinion of "bus-based installation technology"?

A technology with a great future — 86.0%

Interesting, but no demand for it — 7.6%

Interesting, but too complex — 4.6%

Unnecessary gimmick — 0.9%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Very generally, what is your opinion of "bus-based installation technology"?

A technology with a great future
- 47.3% (2005)
- 81.6% (2008)
- 86% (2010)

Interesting, but no demand for it
- 46.9% (2005)
- 14.2% (2008)
- 7.62% (2010)

Interesting, but too complex
- 10.5% (2005)
- 6.4% (2008)
- 4.56% (2010)

Unnecessary gimmick
- 3.6% (2005)
- 0.9% (2008)
- 0.86% (2010)

Legend:
- 2005
- 2008
- 2010

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Very generally, what is your opinion of "bus-based installation technology"?

- 86% of respondents foresee a great future for bus-based installation technology. In 2005 only 47% did. All HVAC companies see bus-based installation technology as a technology with a great future.

- 95% of those respondents with a very high level of skill in bus technology think that the technology has a future; for respondents with little or no skill in this area, however, the figure is just 74%.

- Among companies with 50 employees or more, 83% believe that there is a future in bus technology.

- In response to the question, "Very generally, what is your opinion of bus-based installation technology?", the proportion of respondents in Germany answering "A technology with a great future" varies between 85% (postcodes beginning with 6) and 100% (postcodes beginning with 0 and 1).

- 91% of those respondents till the age of 25 years see a positive future for bus technology, till the age of 50 years 87% and 83% of those respondents that are older than 50 years see a positive future.
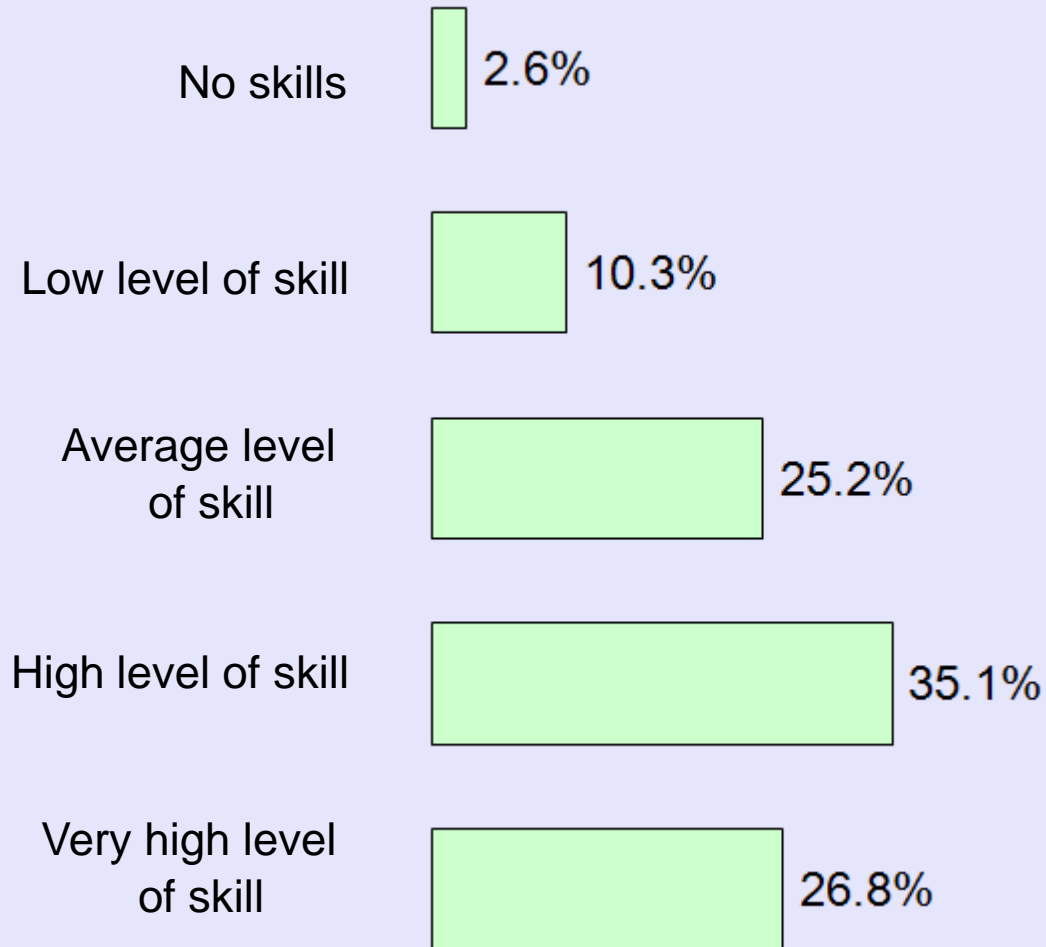
Generally, what do you see as the benefits of "bus-based installation technology" for your customers?

Benefit	Percentage
Increased comfort and convenience	74.1%
Greater flexibility	54.2%
More efficient energy management	54.2%
Improved building monitoring	52.6%
None	4.4%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences
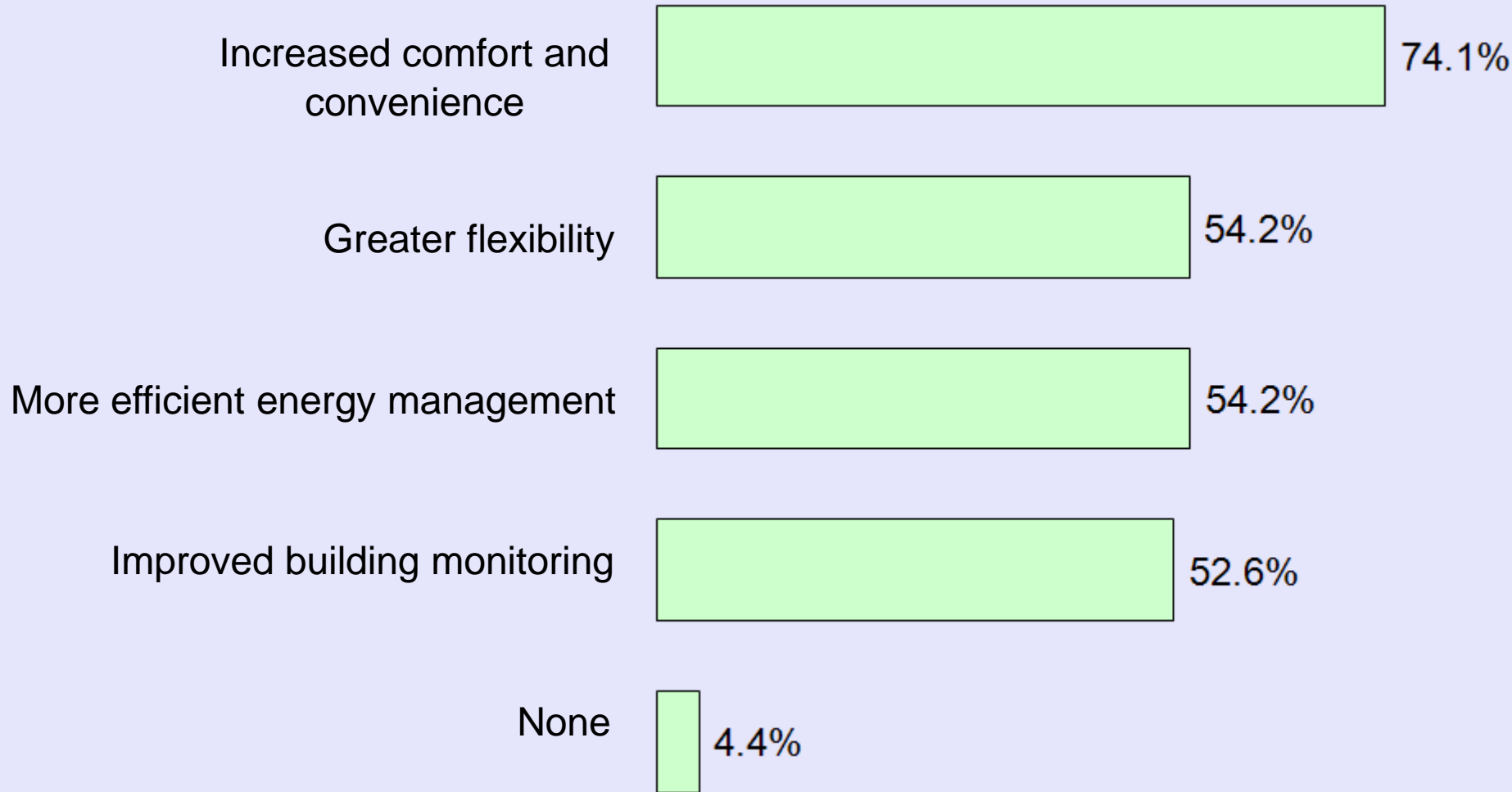
Generally, what do you see as the benefits of "bus-based installation technology" for your customers?

- ☑ 3/4 of respondents consider increased comfort and convenience to be a benefit of bus-based installation technology. The majority of all respondents think that greater flexibility is a benefit for customers.

- ☑ 54% of respondents believe that more efficient energy management is an advantage, while 53% think that customers will benefit from the improved building monitoring offered by the technology.

- ☑ Only 4% could see no benefits for the customer in using bus-based installation technology.

- ☑ Respondents with an above-average level of skill in bus technology see more benefits for the customer in all areas.
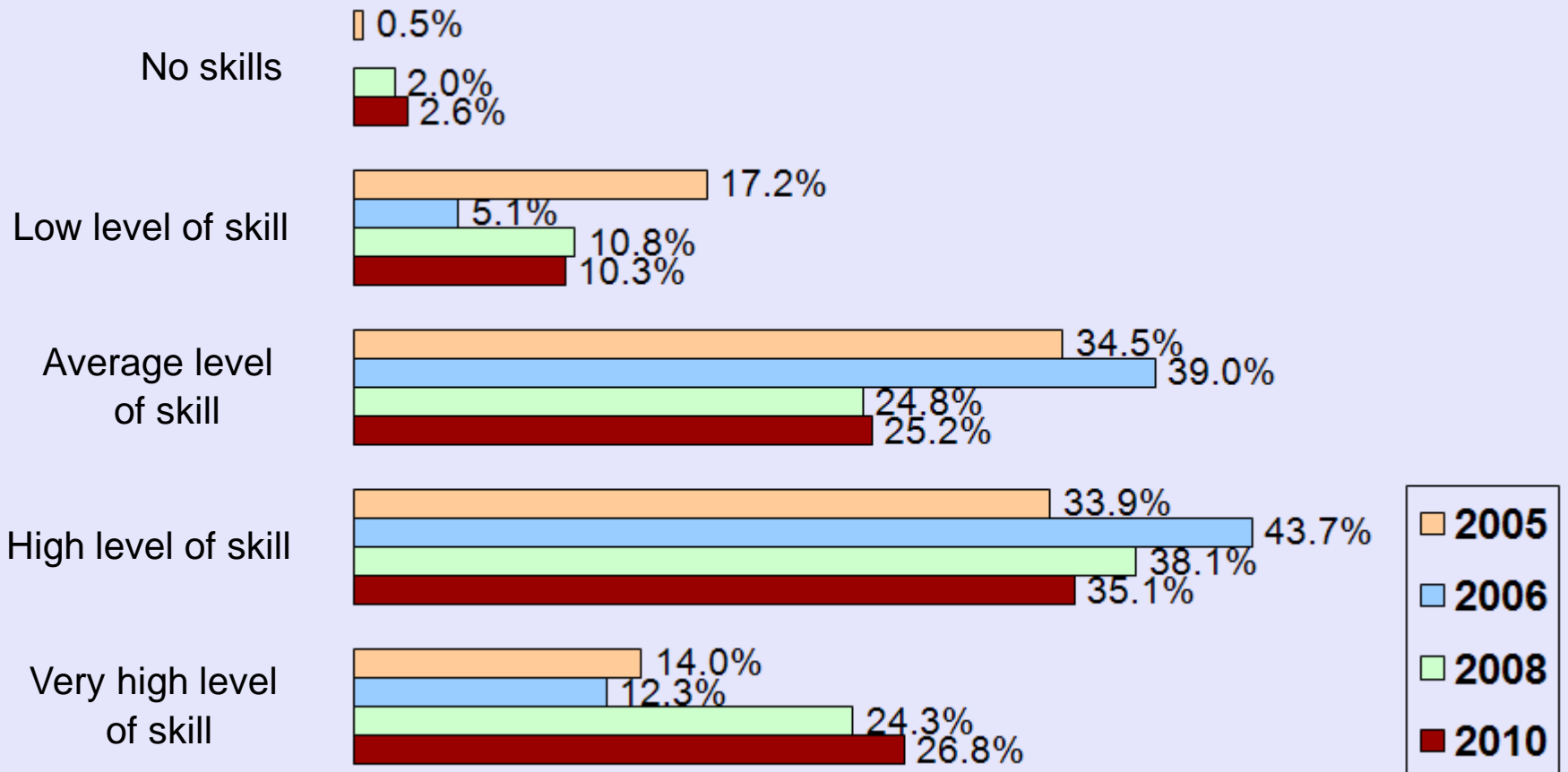
Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

How would you rate overall your company's level of skill in "bus-based installation technology"?

Rating	Percentage
No skills	2.6%
Low level of skill	10.3%
Average level of skill	25.2%
High level of skill	35.1%
Very high level of skill	26.8%

How would you rate overall your company's level of skill in "bus-based installation technology"?

⊡ Almost 2/3 of respondents rate their level of skill as high or even very high.

⊡ Just 2,6% of respondents say that they have no skills at all in this area.

How would you rate overall your company's level of skill in bus-based installation technology?

No skills
- 0.5%
- 2.0%
- 2.6%

Low level of skill
- 17.2%
- 5.1%
- 10.8%
- 10.3%

Average level of skill
- 34.5%
- 39.0%
- 24.8%
- 25.2%

High level of skill
- 33.9%
- 43.7%
- 38.1%
- 35.1%

Very high level of skill
- 14.0%
- 12.3%
- 24.3%
- 26.8%

Legend: 2005, 2006, 2008, 2010

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

How would you rate overall your company's level of skill in "bus-based installation technology"?

- The larger the number of buildings that a company fits with bus technology, the higher its level of skill is likely to be. While respondents with no know knowledge about bus technology equip their houses in average by only 0.6%, and respondents with average knowledge by 12%, respondents with very good knowledge equip their houses by 68%

- It is clear that usage of bus technology increases according to the levels of skill in bus-based installation technology. Indeed, 94% of all respondents at companies that have already used bus technology say that they have either a high or a very high level of skill. Among respondents who either do not use bus technology at all or only plan to in the future, the figure is around just 23%.
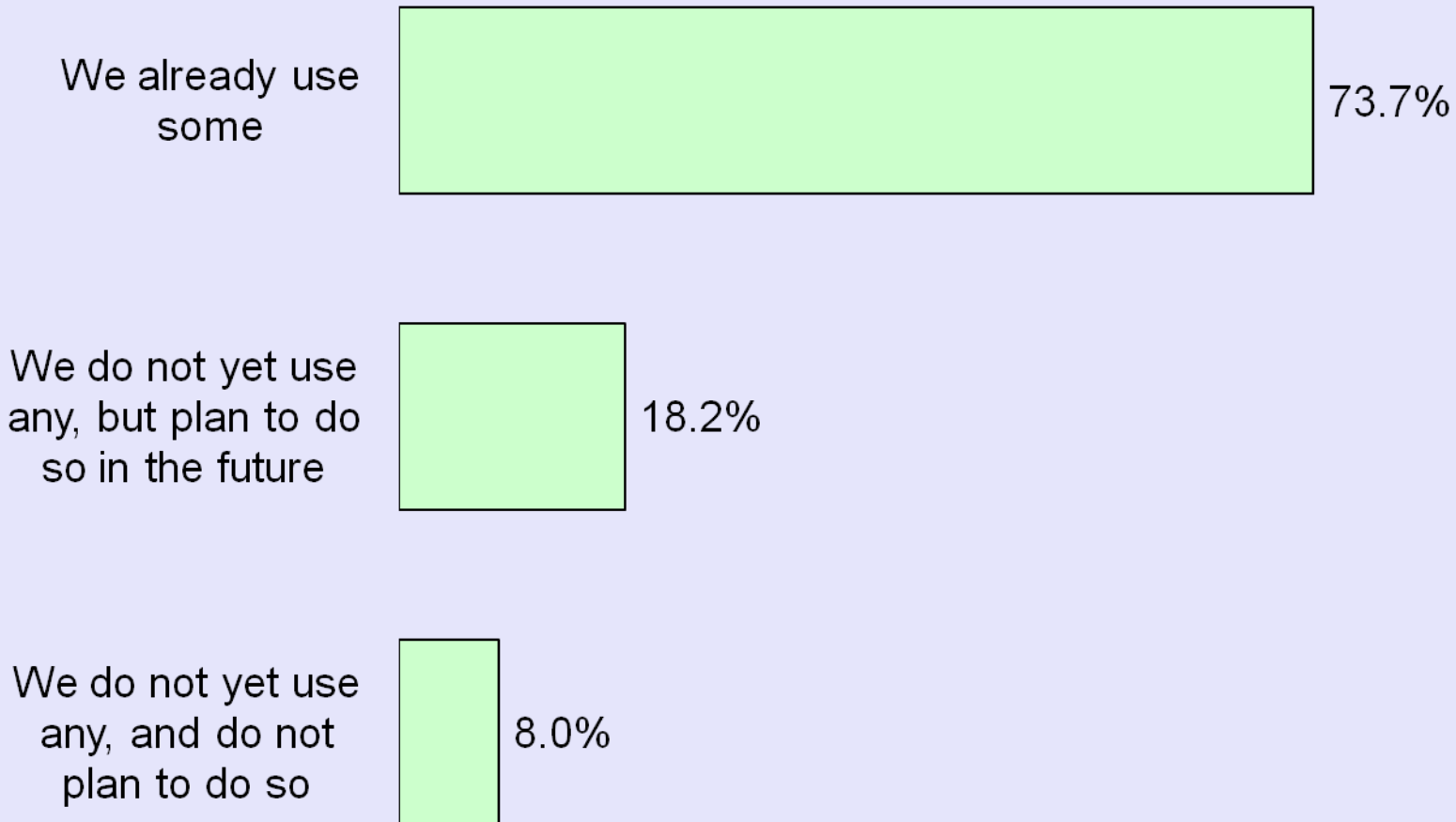
Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Contents

⊡ General information

⊡ Respondent data

⊡ Level of skill in/appraisal of bus technology

⊡ Bus technology usage behaviour

⊡ Networking technologies used

⊡ Conclusion/recommendations

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Bus technology usage behaviour

⇨ Usage of bus technology

⇨ Total number of buildings worked on annually

⇨ Proportion of these which are equipped with bus technology

⇨ Proportions of residential and commercial buildings

⇨ Who takes the decision to use bus technology

⇨ Whether the company actively offers bus technology
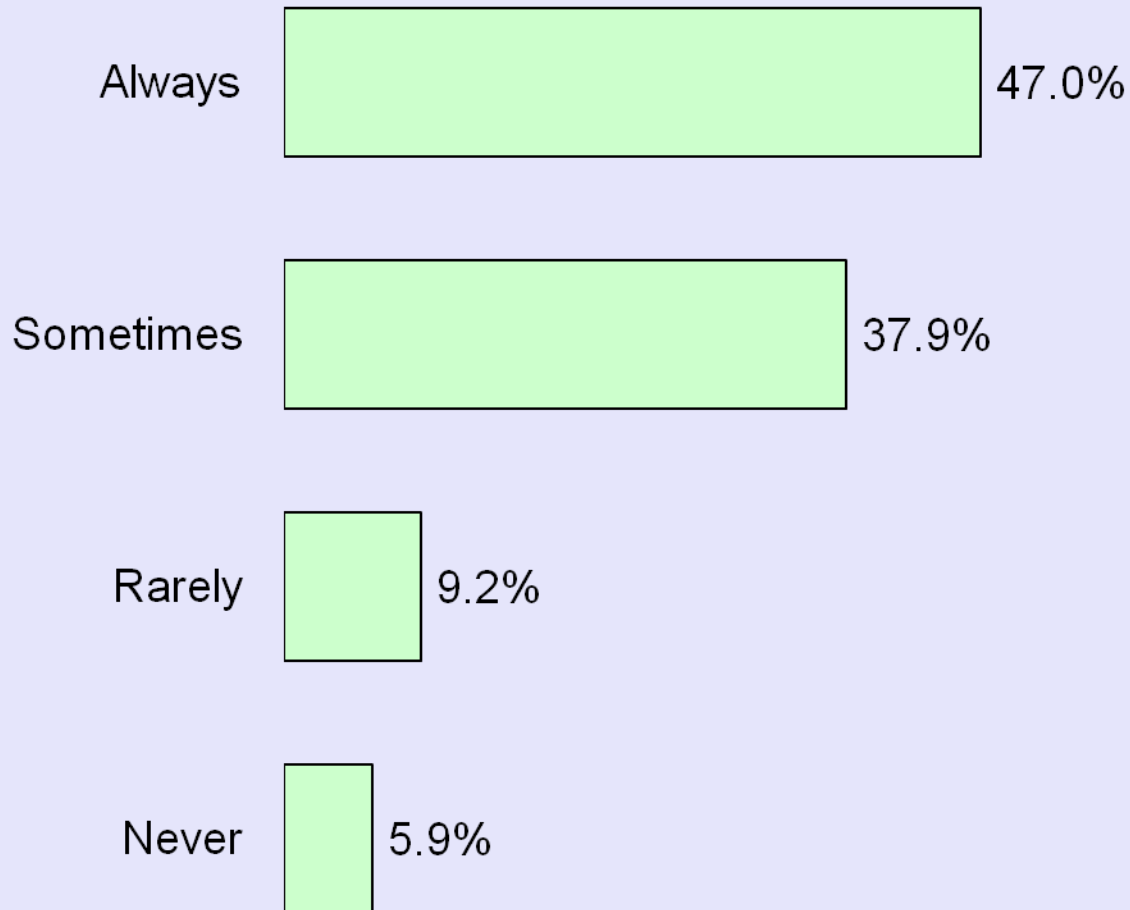
⇨ Current and future areas of use

To what extent does your company already use "bus-based installation technology"?

We already use some — 73.7%

We do not yet use any, but plan to do so in the future — 18.2%

We do not yet use any, and do not plan to do so — 8.0%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

To what extent does your company already use "bus-based installation technology"?

- 3/4 of all respondents said that their company had already used bus-based installation technology, while a further 18% plan to do so in the future. Only 8% neither use this technology at present nor plan to do so in the future.

- In 2005 as many as 28%, in 2010 as many as 8% did not even intend to use bus-based installation technology in the future, which may however be partly due to the different age distributions of respondents in the different years.

- HVAC companies are clearly in the lead in terms of usage of bus-based installation technology, with 88% of these companies using the technology. Architects were the least likely to use the technology (41%), with 29% of architects not even planning to use it in the future.
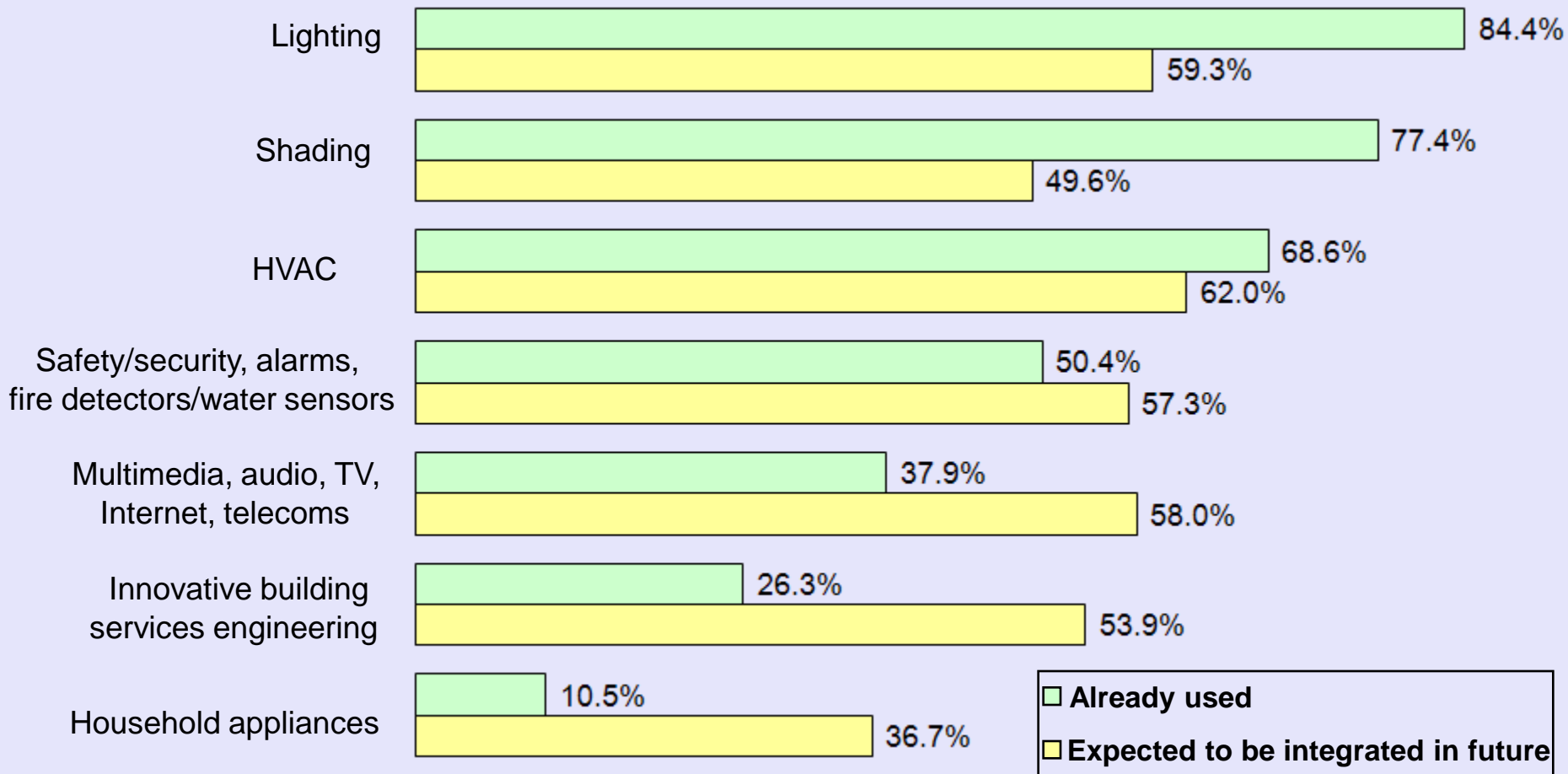
Do you actively offer bus technology to your client?

Always — 47.0%

Sometimes — 37.9%

Rarely — 9.2%

Never — 5.9%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Do you actively offer bus technology to your client?

- Not even half of respondents said that they actively offer bus technology to their client. 15.1% of respondents said that they offer bus technology either rarely or not at all.

- companies that do not equip one single building annually with bus technology still offer their clients the technology at 39%, whereas the figure is as much as 69% for companies that fit more than 20 buildings every year with bus technology.

- Building services designers/planners (56%) and Installers (56%) are above average in terms of their likelihood of always actively offering bus technology.

- The higher a company's level of skill in bus technology, the more likely it is "always" to offer its clients the technology. While only 16% of respondents with little or no skill always offer it, for those with a very high level of skill the figure is as much as 76%.
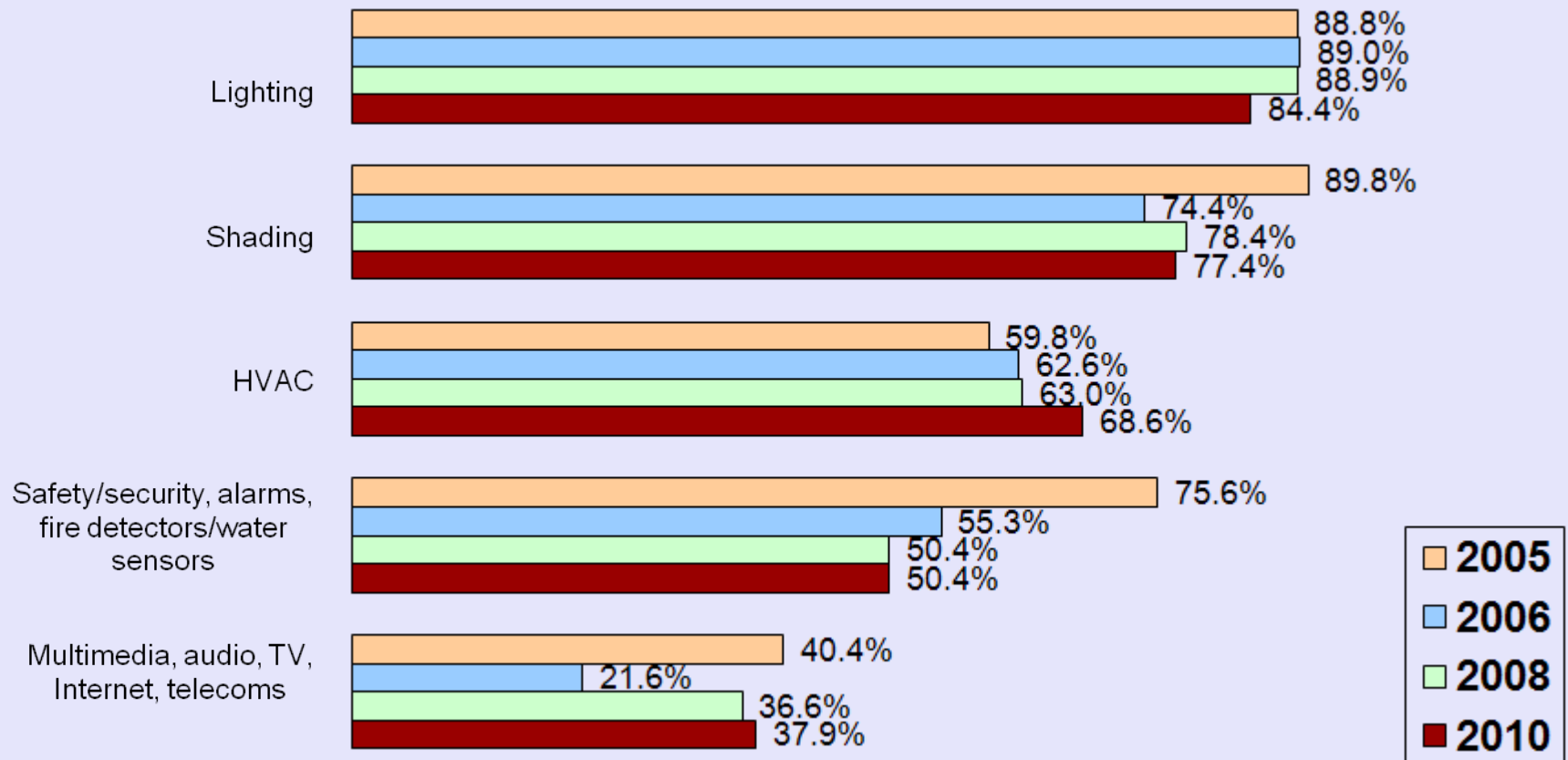
In what areas have you already used bus-based installation technology, and what trades do you think will be integrated increasingly into bus systems in the future?

Area	Already used	Expected to be integrated in future
Lighting	84.4%	59.3%
Shading	77.4%	49.6%
HVAC	68.6%	62.0%
Safety/security, alarms, fire detectors/water sensors	50.4%	57.3%
Multimedia, audio, TV, Internet, telecoms	37.9%	58.0%
Innovative building services engineering	26.3%	53.9%
Household appliances	10.5%	36.7%

☐ **Already used**
☐ **Expected to be integrated in future**

In what areas have you already used bus-based installation technology, and what trades do you think will be integrated increasingly into bus systems in the future?

▫ More than half of all respondents have already used bus-based installation technology for lighting (84%), shading (77%), heating/ventilation/ air-conditioning (67%) and/or safety/security/alarms/fire detectors/water sensors (50%).

▫ Increased use of bus technology in the future is anticipated above all in the areas of multimedia/audio/TV/Internet/telecommunications, safety/security/alarms/fire detectors/water sensors, innovative building services engineering and white goods.

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

In what areas have you already used bus-based installation technology?

In what areas have you already used bus-based installation technology?

- ⊡ While lighting (by 4.5% points) and shadding (one percent) in 2010 decreased, compared to 2008, all other areas' values have increased or remained the same.

- ⊡ In 2006, multimedia was cited less frequently, since the answers available related only to commercial buildings, while in 2005 safety/security was mentioned more frequently, as the possible answers referred only to private households.
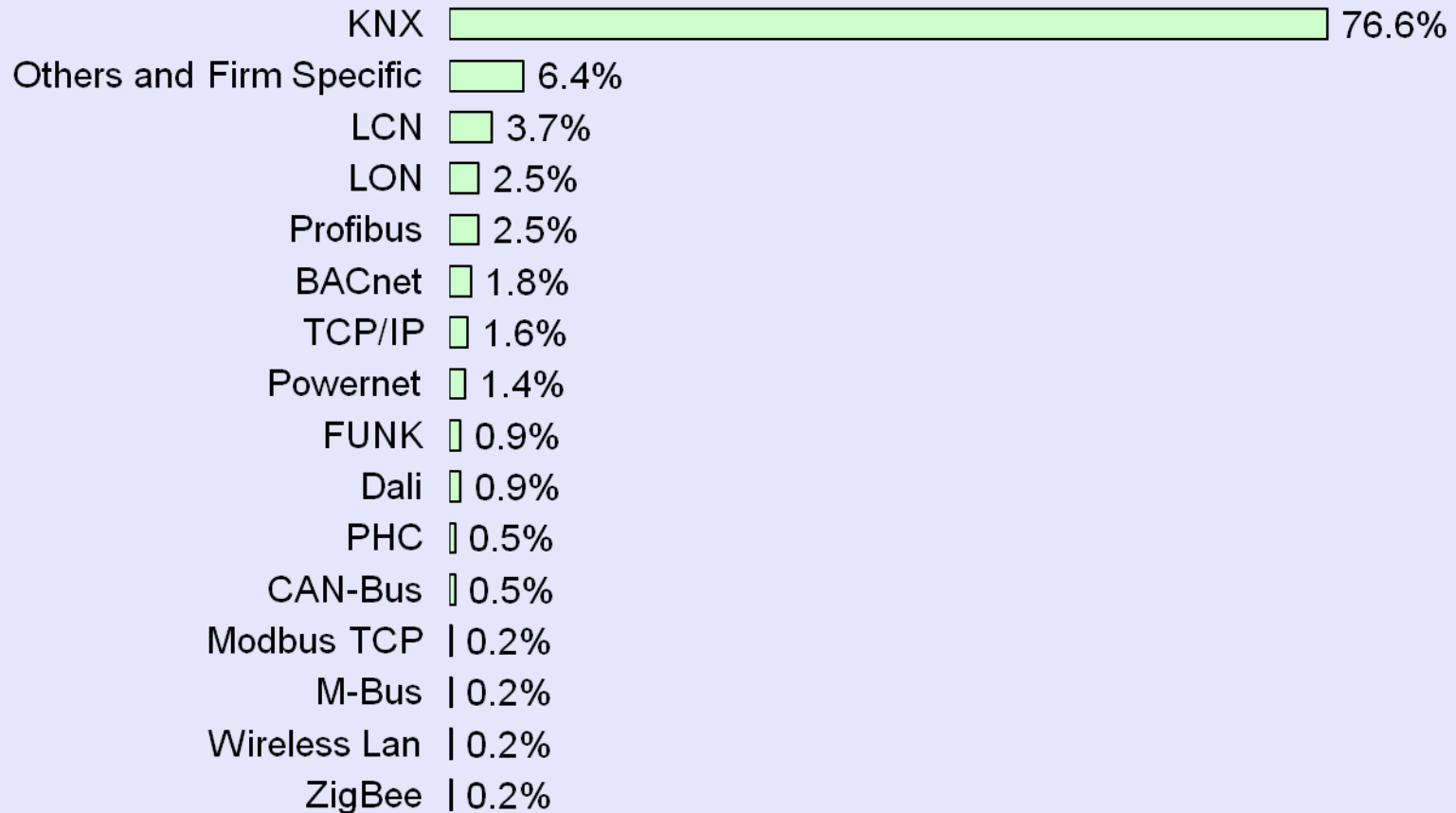
Contents

▣ General information

▣ Respondent data

▣ Level of skill in/appraisal of bus technology

▣ Bus technology usage behaviour

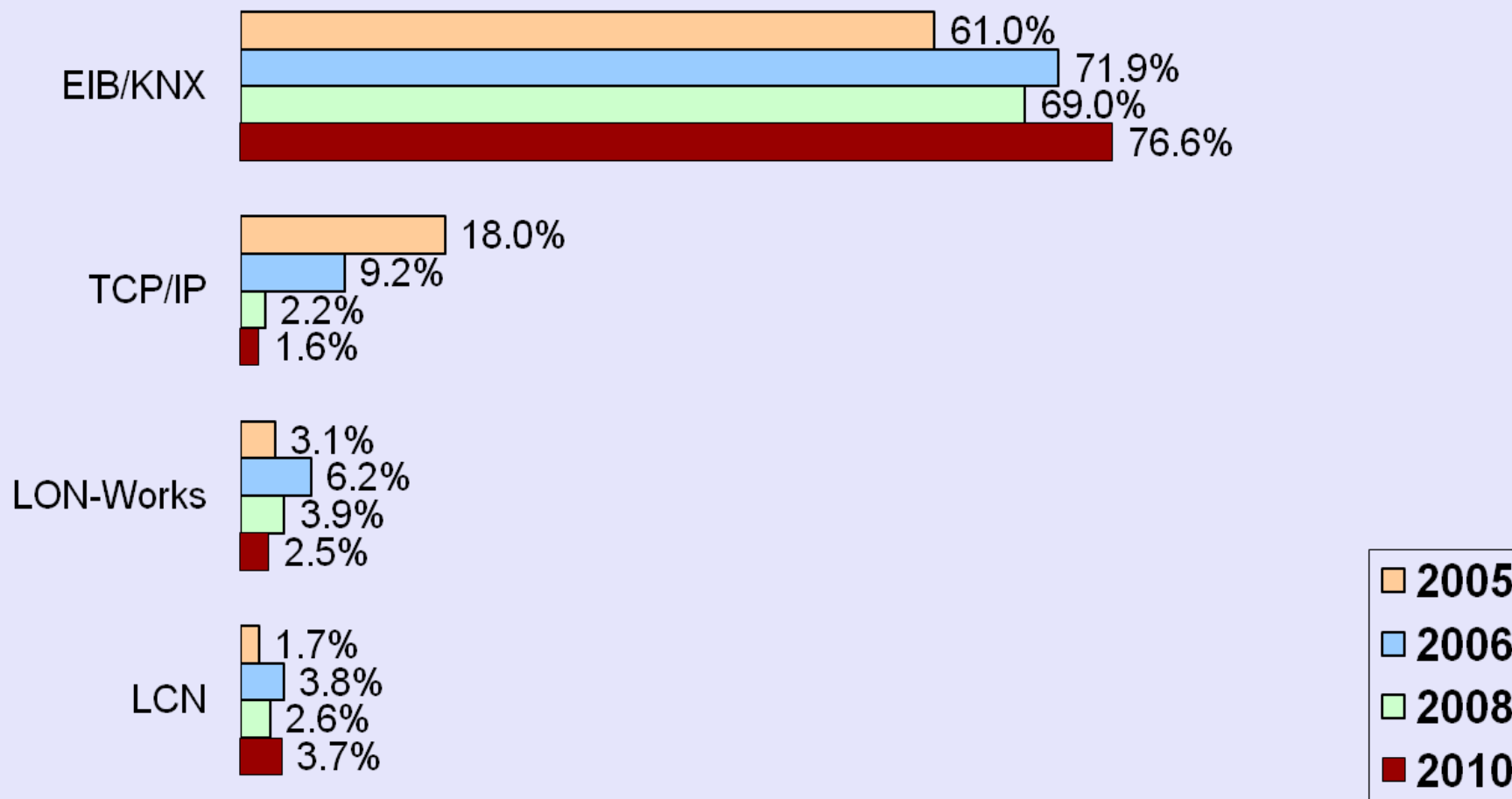▣ Networking technologies used

▣ Conclusion/recommendations

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Networking technologies used

⇨ Bus technologies respondents have heard of

⇨ Bus technologies respondents have worked with

⇨ Which bus technology respondents have worked with most frequently

⇨ Reasons for using the preferred bus technology

⇨ Transmission media

⇨ Appraisal of future demand in residential buildings

⇨ Appraisal of future demand in commercial buildings

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

What bus technology do you work with most frequently?

Technology	Percentage
KNX	76.6%
Others and Firm Specific	6.4%
LCN	3.7%
LON	2.5%
Profibus	2.5%
BACnet	1.8%
TCP/IP	1.6%
Powernet	1.4%
FUNK	0.9%
Dali	0.9%
PHC	0.5%
CAN-Bus	0.5%
Modbus TCP	0.2%
M-Bus	0.2%
Wireless Lan	0.2%
ZigBee	0.2%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
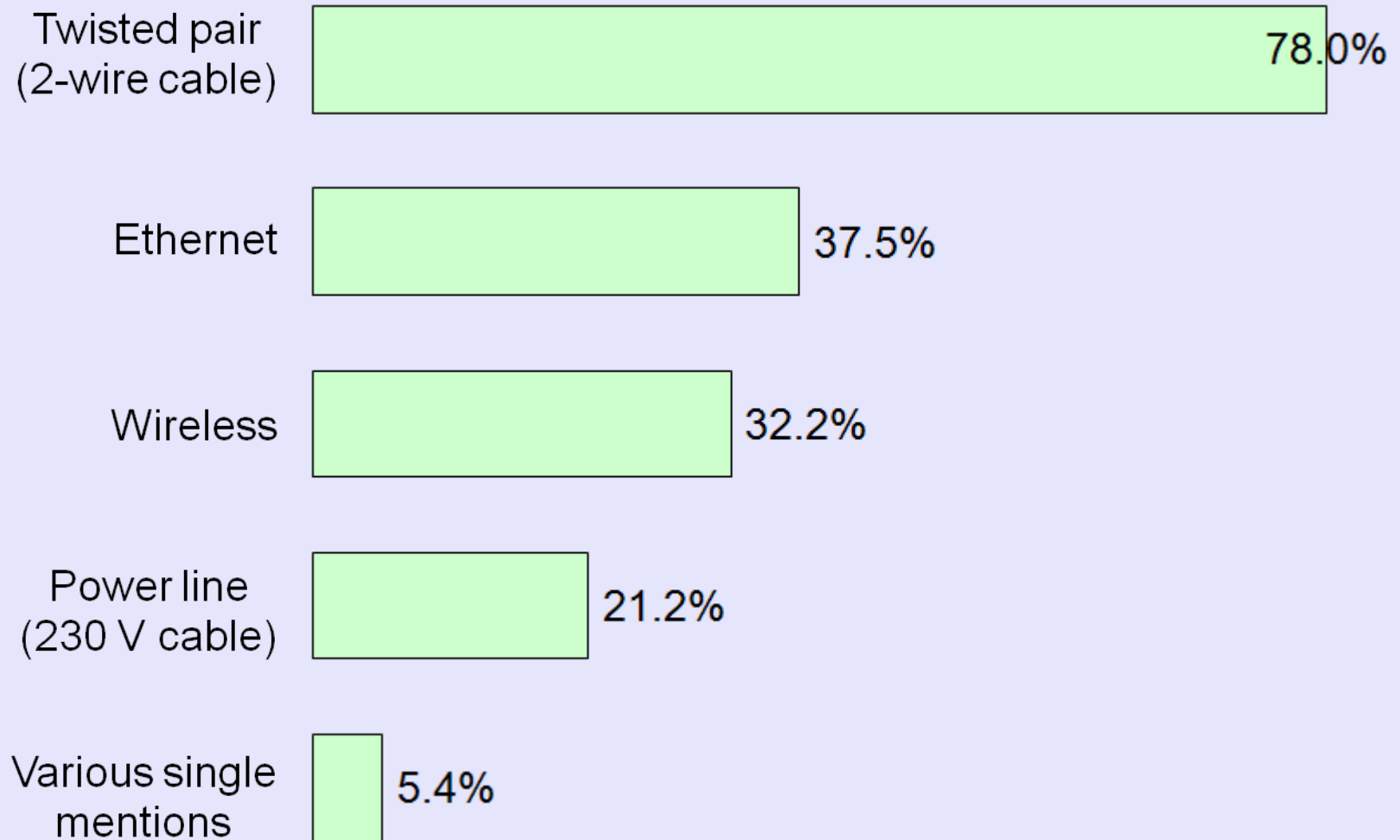*University of Applied Sciences*

What bus technology do you work with most frequently?

What bus technology do you work with most frequently?

- Here, too, the majority of all respondents said that they used KNX most frequently by a percentage of 77%.

- The results for the years 2005, 2006 and 2008 can be seen to be similar. KNX is well ahead in all three years. In the year 2010 KNX could even raise this value by 8% points compared to 2008
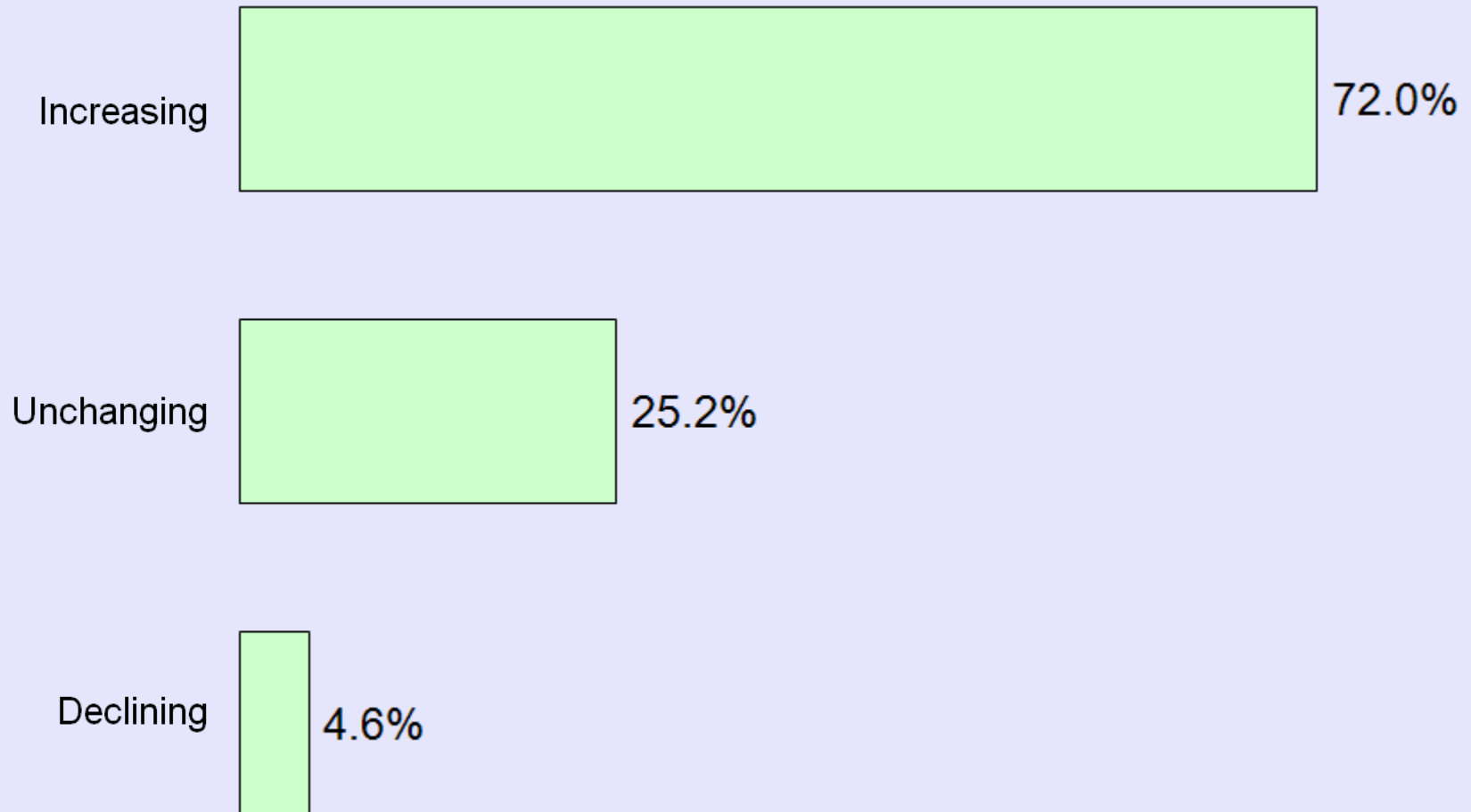
Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

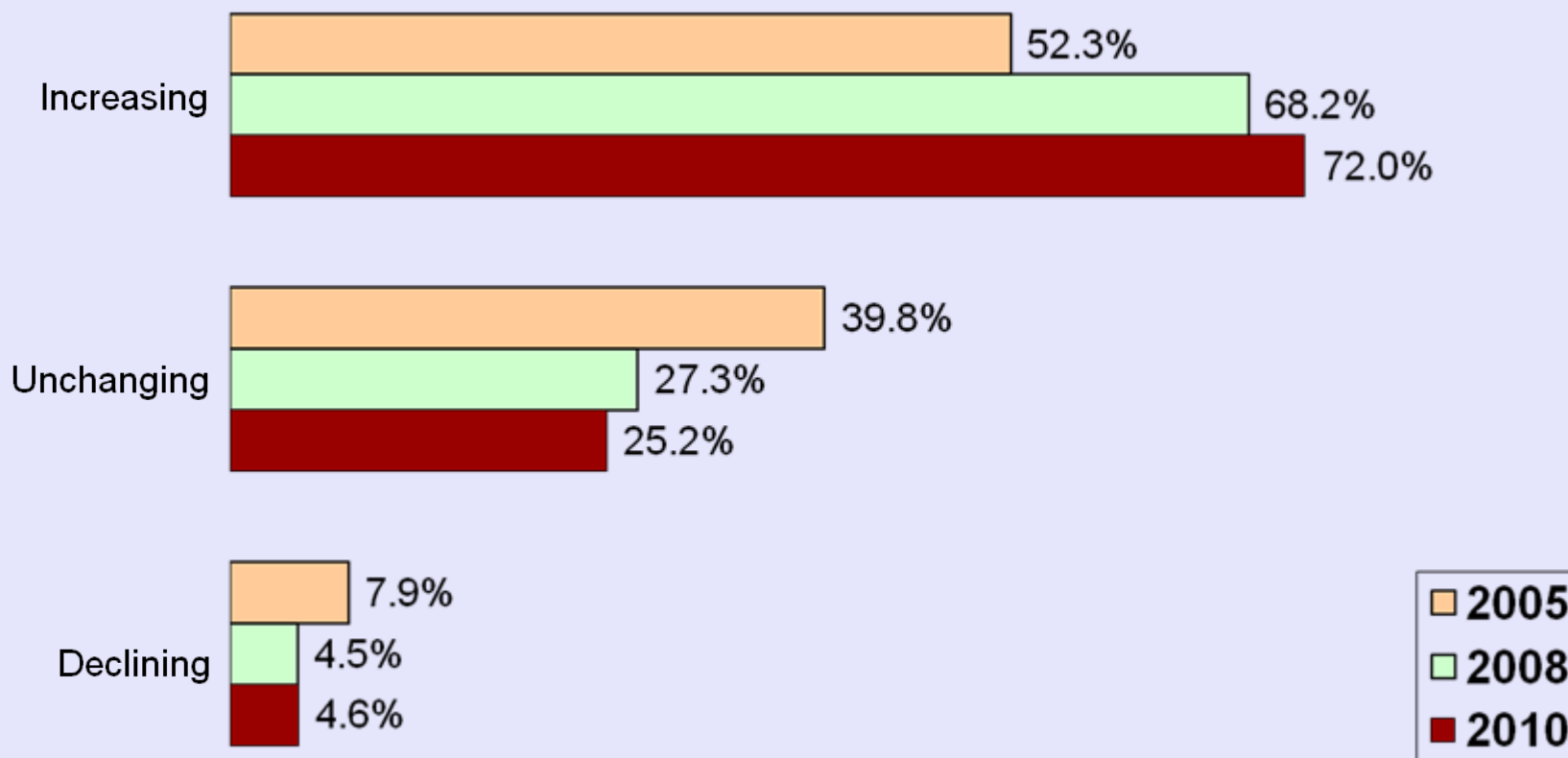# What transmission media do you use with bus technology?

What transmission media do you use with bus technology?

- 78% of all respondents said that they use twisted pair cabling.

- All other media such as Ethernet, wireless, power line and other media are not even used half as much as twisted pair cabling

- Twisted pair is used most often by building services designers/planners. Architects prefer twisted pair the least but Ethernet the most

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

How in general do you rate future demand at your company for bus technology in residential buildings?

Increasing — 72.0%

Unchanging — 25.2%

Declining — 4.6%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

How in general do you rate future demand at your company for bus technology in residential buildings?

	2005	2008	2010
Increasing	52.3%	68.2%	72.0%
Unchanging	39.8%	27.3%	25.2%
Declining	7.9%	4.5%	4.6%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
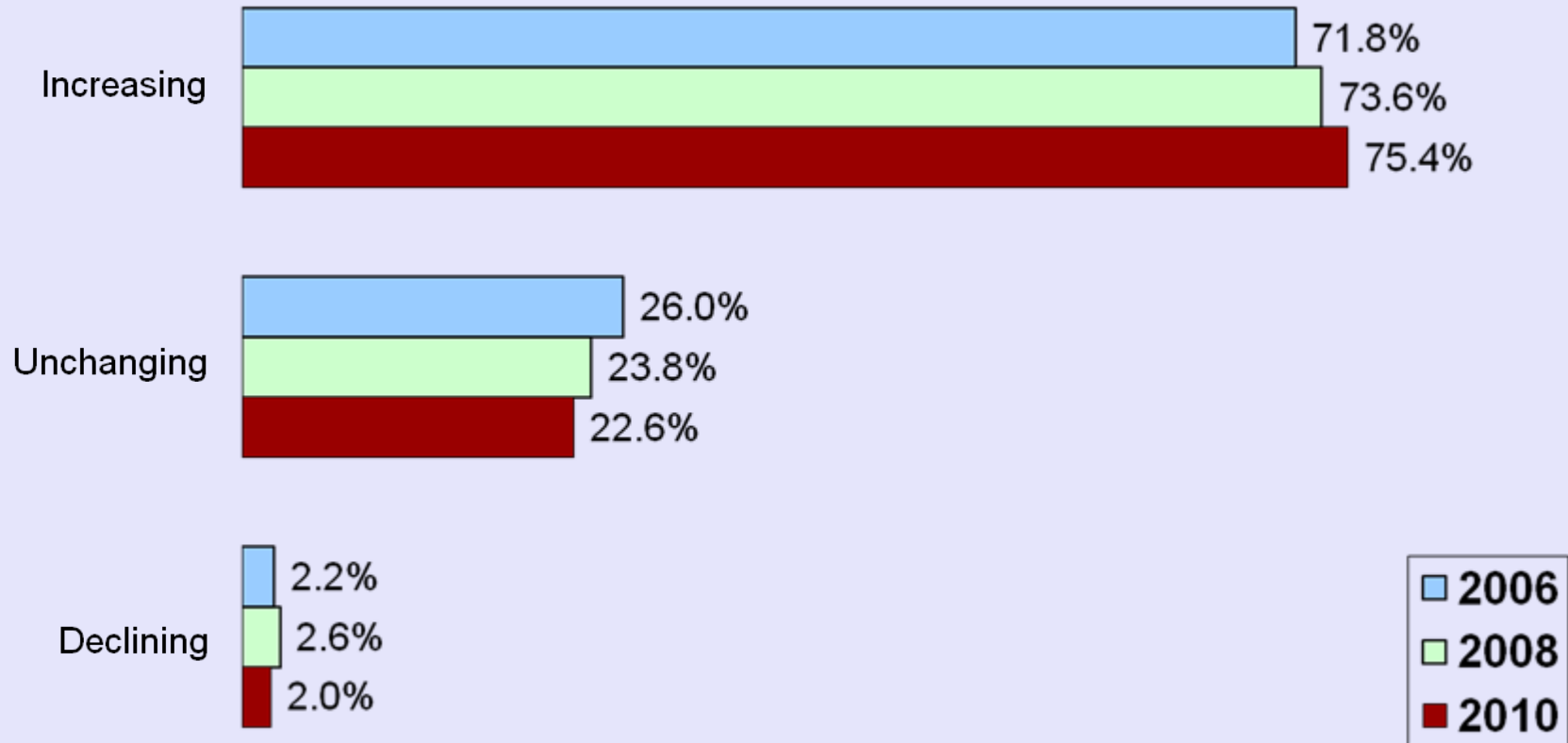*University of Applied Sciences*

How in general do you rate future demand at your company for bus technology in residential buildings?

- ▪ Already in 2005, the participants estimated a growing need for bus technology in residential construction by 52.3%. In 2008, this value rose to 68.2%. In 2010, 72% of all participants estimated a higher demand for bus technology.

- ▪ In 2005, 7.9% of all respondents thought that demand would decline. By 2008 this figure had fallen to as low as 4.5%. This number is with a deviation of 0.1% points in 2010 constant.

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

How in general do you rate future demand at your company for bus technology in commercial buildings?

Increasing — 75.4%

Unchanging — 22.6%

Declining — 2.0%

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences
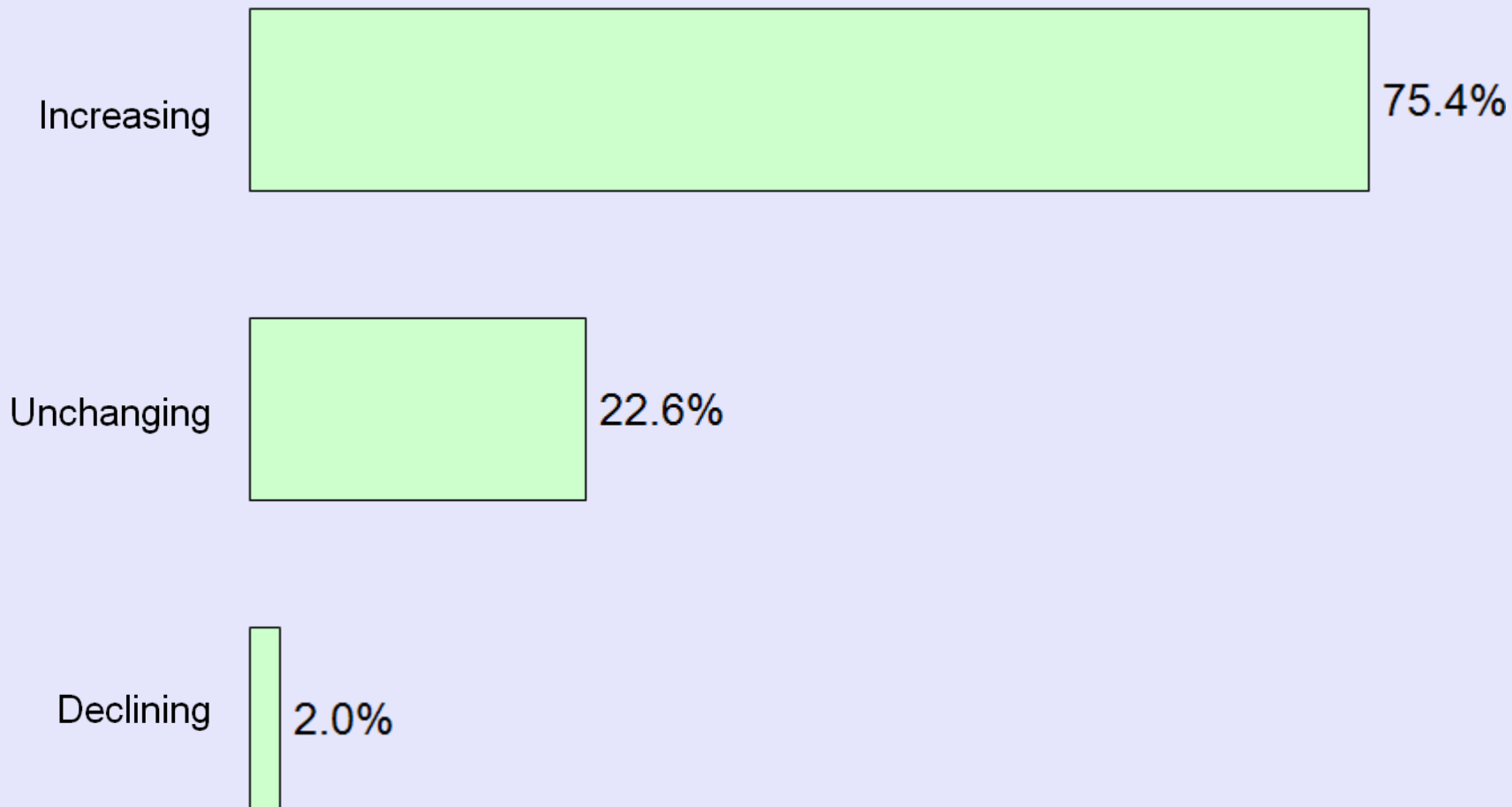
How in general do you rate future demand at your company for bus technology in commercial buildings?

How in general do you rate future demand at your company for bus technology in commercial buildings?

- Although between the years 2005 and 2010 there only exist small changes in values, it can be realized that the number of optimists rose over the years and the number of pessimists declined.

- 3/4 of all participants estimate a higher demand for bus technology for commercial buildings.

- Only 2.0% of the participants estimate the demands to decrease.

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences

Many thanks for your attention

Fachhochschule Südwestfalen
Hochschule für Technik und Wirtschaft
University of Applied Sciences