Prefabricated housing market in Central and Northern Europe – Overview of market trends and development

Study extract

Munich, January 2018

Management summary (1/2)

- The market study at hand analyzes the prefabricated 1+2 family housing market in Central and Northern Europe, covering the countries Germany, Scandinavia, the UK, Austria, Switzerland and Poland, and is based on primary and secondary sources of information
- The market volume of 1+2 family housing in focus regions is expected to display solid growth of 2.0% p.a. from 2017 to 2022, driven by a strong anticipated GDP development, favorable financing conditions, and governmental regulations and subsidiaries
- Among 1+2 family housing, the prefabricated housing segment (c.15% of all 1+2 family houses) is expected to further gain in relevance by growing at 3.2% p.a. from 2017 to 2022, driven particularly by an increasing demand for planning security and technology acceptance
  - Germany (c.25 k), followed by Scandinavia (c.13 k) and the UK (c.12 k) are expected to display the largest prefab volumes in 2017
  - Absolute volume growth is projected to be driven by Germany (3.1% p.a. in 2017-'22), the UK (3.8% p.a.) and Scandinavia (3.5% p.a.) – In Poland prefabricated housing is currently less popular, considerable catch-up effects are expected going forward (6.9% p.a.)
- Within prefabricated 1+2 family housing, there is a trend towards turnkey solutions with convenience and security as key drivers
  - Turnkey solutions are the prevailing prefabricated finishing type, accounting for c.50% of the market volume, and are projected to outgrow the prefabricated housing market in all focus regions (3.8% p.a. vs. 3.2% p.a. volume growth)
  - Germany (c.10 k), Scandinavia (c.8 k) and the UK (c.7 k) are the largest prefabricated turnkey housing markets in 2017 and are expected to grow at c.4% p.a. between 2017 and 2022
- The market value of prefabricated 1+2 family housing is expected to grow at c.6% p.a. between 2017 and 2022 in Central and Northern Europe due to favorable pricing trends (e.g. shift towards more expensive turnkey solutions and increasing wage levels)
  - Turnkey solutions are forecast to outgrow the prefabricated housing market with c.7% growth p.a.
  - Geographically, Switzerland (c.360 k per average prefabricated house), Scandinavia (c.330 k) and the UK (c.250 k) show the highest average prefabricated 1+2 family housing prices in 2017, while Poland (c.80 k) is estimated to have the lowest price level

Source: Roland Berger

Management summary (2/2)

- The route-to-market differs by focus region: In the DACH region (Germany, Austria, Switzerland), prefabricated 1+2 family houses are typically sold directly to end customers, while the UK has a higher share of intermediaries (i.e. developers and housing associations)

- The key buying criteria of customers are price/quality ratio, quality of sales, product customization and brand perception – Customers are increasingly willing to pay for superior quality, given the overall high investment combined with an expected long period of usage

- In the DACH region, several manufacturers of prefabricated 1+2 family housing exist, with vast differences in product price segment and level of finishing type
  - > The largest manufacturers are DFH, followed by Equistone assets (Bien-Zenker and Hanse Haus), WeberHaus, FingerHaus and Polish-headquartered Danwood based on 2016 revenues
  - > The majority of manufacturers have been able to gradually increase their revenues between 2012 and 2016, driven by a favorable market environment, which is expected to be the base for further growth going forward

- Specifically for Germany, the prefabricated 1+2 family housing market appears to be largely fragmented with the top 5 suppliers accounting for c.30% and suppliers beyond the top 5 holding market shares of below 3%
  - > Within the prefabricated 1+2 family housing market, the turnkey subsegment reveals a similarly high level of market concentration
  - > This market characteristic creates possibilities for M&A activity, which has intensified in recent years

- The entry of new manufacturers in the prefabricated 1+2 family housing market is hampered by several barriers – The main market entry barriers are related to technical capabilities, sales network with an attractive online channel, brand/track record and capital intensity

Source: Roland Berger

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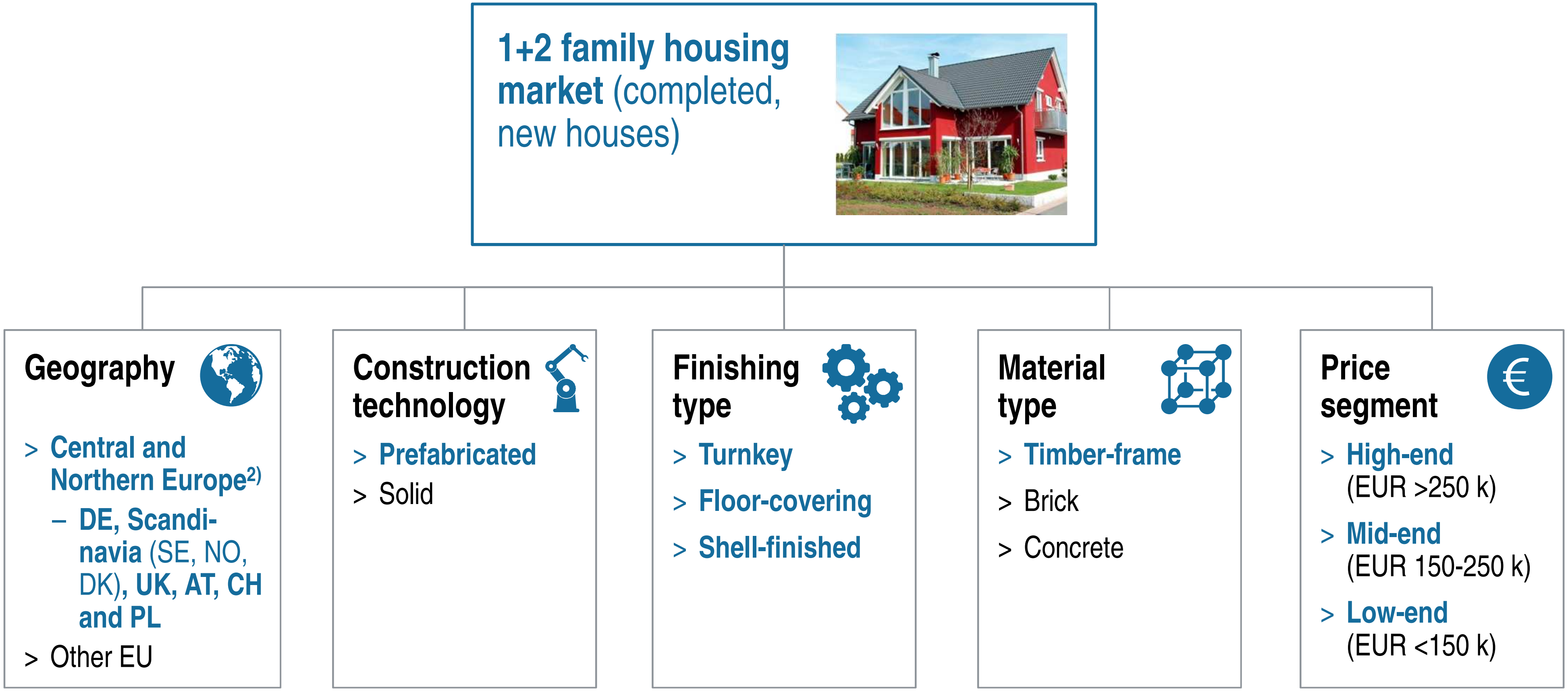
E. Roland Berger 45

Source: Roland Berger

A. Market segmentation

The 1+2 family housing market can be split along five dimensions: Geography, construction tech., finishing & material type and price

Segmentation of the 1+2 family housing market



1+2 family housing market (completed, new houses)

Geography
- **Central and Northern Europe**[2)]
  - **DE, Scandinavia** (SE, NO, DK), **UK, AT, CH and PL**
- Other EU

Construction technology
- **Prefabricated**
- Solid

Finishing type
- **Turnkey**
- **Floor-covering**
- **Shell-finished**

Material type
- **Timber-frame**
- Brick
- Concrete

Price segment
- **High-end** (EUR >250 k)
- **Mid-end** (EUR 150-250 k)
- **Low-end** (EUR <150 k)

In blue: Focus of this study

2) Note: The key focus of this study is on Central and Northern Europe; Poland was added to the analysis as a representative country for the promising Eastern European region

Source: Roland Berger

The study focuses particularly on the prefabricated housing market, which can be segmented by finishing type, material type and price

Segmentation of the 1+2 family housing market

Indicative – Non-scaled

Residential housing type

Completed 1+2 family houses

Single (detached) and two-family (semi-detached) houses

Construction technology

Solid

Traditional building technologies using brick/concrete or wood in which construction takes place almost entirely on building site

Focus of this study

Prefabricated

Industrially prefabricated houses which are delivered in finished parts to the building site and assembled there

Finishing type

- Turnkey
- Floor-covering
- Shell-finished

Material type

- Timber-frame
- Other

Price segment

- High-end (EUR >250 k)
- Mid-end (EUR 150-250 k)
- Low-end (EUR <150 k)

Source: Roland Berger

The prefabricated housing segment seems to be particularly well positioned to meet changing customer demand trends

Deep dive on construction technology: Customer demand trends

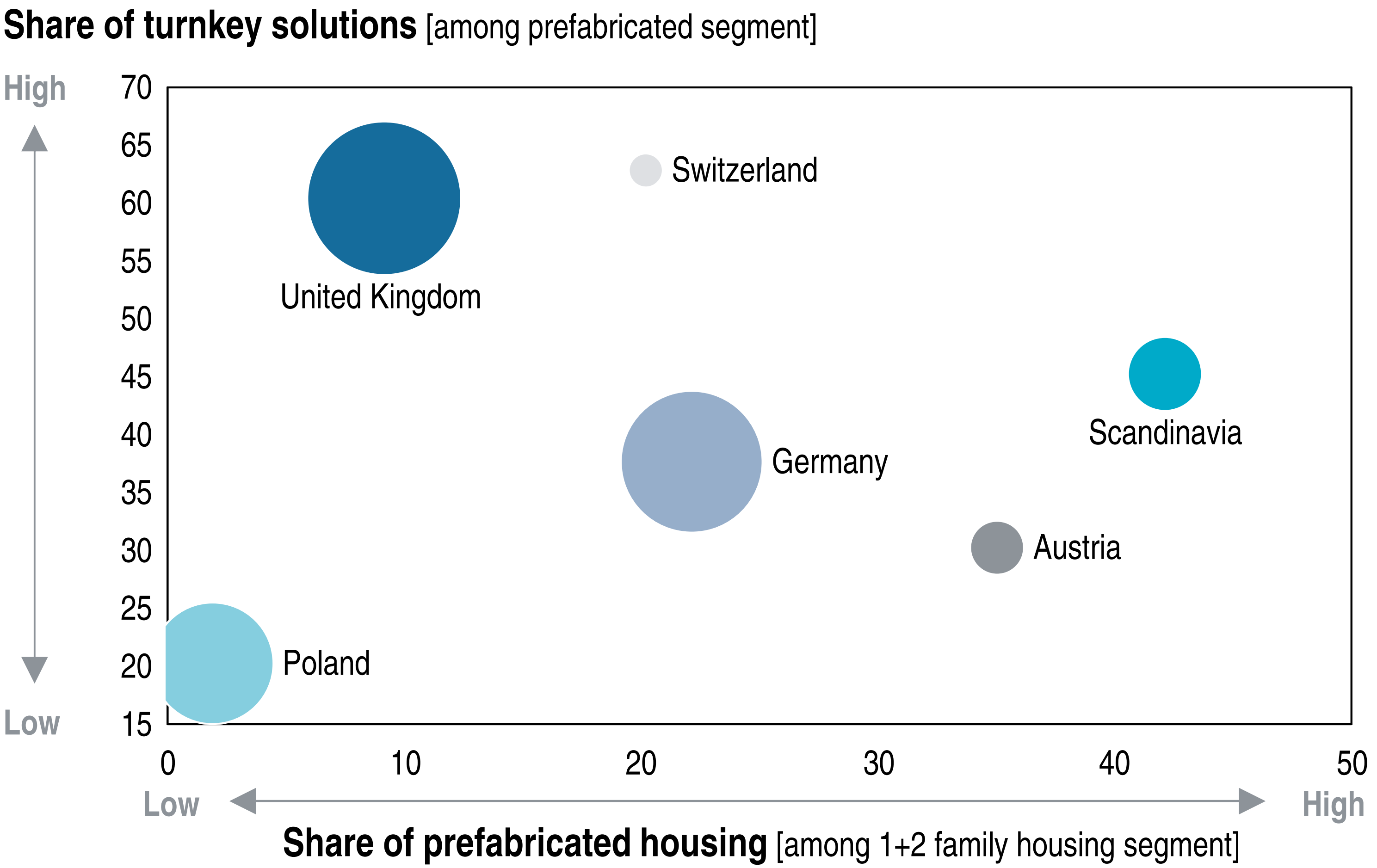
Selected customer demand trends	Solid houses	Prefabricated houses	Comment
Increasingly busy lifestyle and importance of leisure time > Convenience of house construction process (i.e. one-stop shop and turnkey solutions) gains in importance	◐	●	> While the majority of solid house construction is supervised and coordinated by an owner, most of the prefabricated suppliers fully cover the entire house construction process
Increasing need for risk avoidance in a fast changing world > Increased need for stabilization and certainty of future construction outcomes in terms of price and time	◐	◕	> Prefabricated housing suppliers typically offer a higher certainty in regard to construction budget and delivery date as compared to solid construction
Increasing health consciousness > Increasing awareness of importance of healthy living and natural construction technologies	◐	◕	> A timber-framed house is considered more natural than a solid construction, offering benefits such as greater air circulation and less waste production during construction
Increasing price and product awareness of customers > Easier access to product offerings and comparisons as well as higher awareness of 'reasonable' house prices	◐	◕	> Traditionally, prefabricated houses offer higher transparency on designs and prices, however, lately this advantage was partly diminished by growth of solid house catalogue players
Decreasing (building related) technical competency of customers > Growing number of customers typically have low experience and knowledge of house construction processes and material selection	◔	◕	> Increasing number of customers are willing to delegate the house construction process to a professional supplier that supervises and coordinates all construction work and crews
Increasing need for security > Importance of staying safe and secure is growing, especially in an increasingly volatile environment	◕	◐	> Solid houses that offer thicker, hardly inflammable walls are still considered more secure than timber-framed houses by many customers, although the provision of long-term guarantees has helped to change this perception slightly
Increasing importance of individuality and customization > Customers increasingly require the possibility to select products from a broad product range with many customization options	●	◕	> Although the possibility of customization of house architecture has largely improved for prefabricated houses, solid houses provide fewer technical constraints in this respect

● Fully addressing trend ○ Not addressing trend

Source: Interviews, Roland Berger

Scandinavia appears to have the highest prefab share and Switzerland the highest turnkey share – Low prefab and turnkey shares in Poland

Overview of market segmentation by focus regions, 2017



Relevant market size (indicative), number of completed 1+2 family houses p.a.

- Scandinavia, Austria and Germany are estimated to have the highest prefabricated shares among focus regions – Low share is assumed in the UK and Poland (focus on solid constructions)
- The share of turnkey solutions in the prefabricated segment is expected to be highest in Switzerland, the UK and Scandinavia, while Poland and Austria indicate rather low shares

Source: Euroconstruct, Interviews, Roland Berger

B. Market trends and drivers

The prefabricated housing market volume and price are expected to be favorably driven by a number of trends

Key market trends for the prefabricated housing market

Indicative

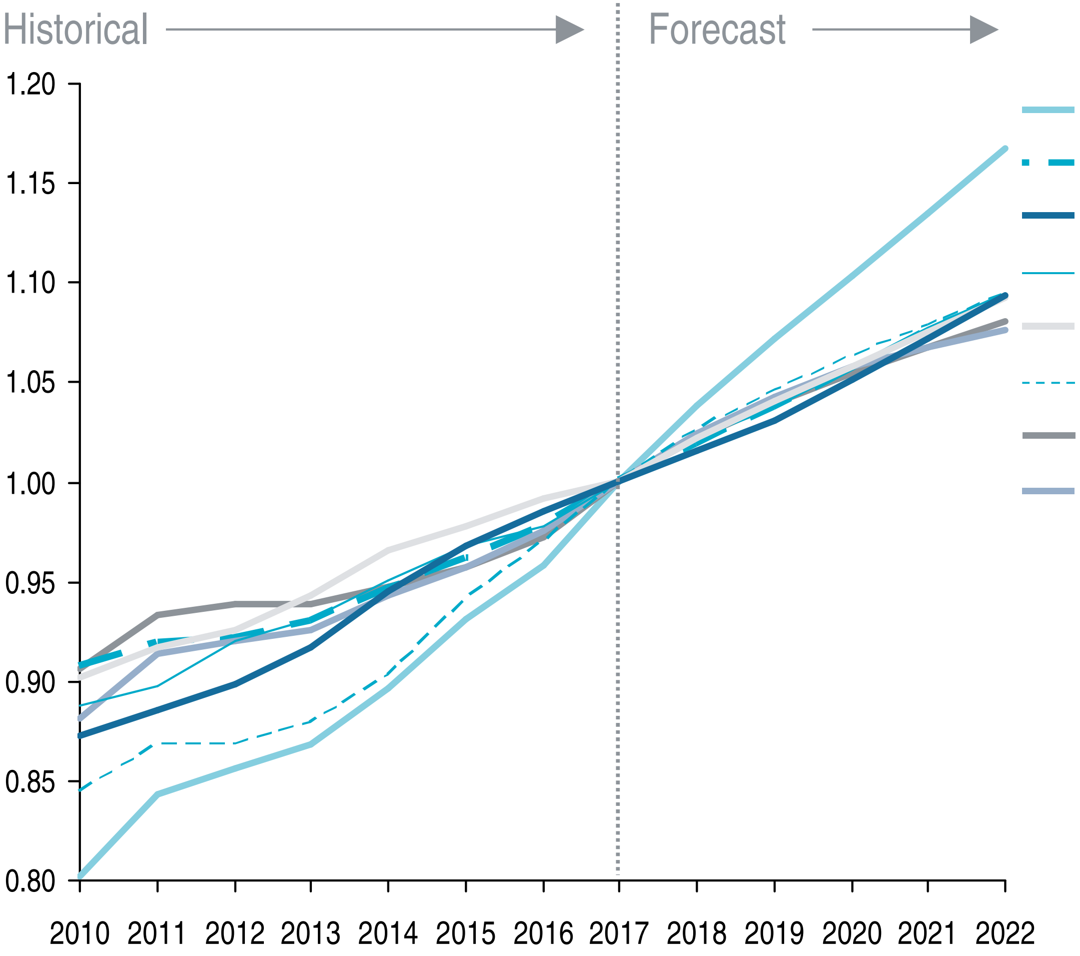
			Market trends	Rele-vance	Influence on 🇩🇪	🇳🇴🇩🇰🇸🇪	🇬🇧	🇦🇹	🇨🇭	🇵🇱	Description
Volume	1+2 family housing	A	GDP development	◕	↗	↗	↗	↗	↗	↑	> Short/mid-term GDP growth rates are one of the closest proxies for construction development – Positive GDP growth rates expected
		B	Financing conditions and land costs (interest rates)	◑	→	→	→	→	↗	→	> Interest rates are expected to remain at record low levels in focus regions until 2019, positively impacting the new 1+2 housing market > From 2019 onwards moderate increases are expected to be partially compensated for by a stabilization of land prices
		C	Population growth (incl. migration)	◑	→	↗	↗	↗	↗	→	> The overall population level is expected to remain at a largely stable to slightly increasing level in all focus regions in the upcoming years
		D	Energy efficiency regulations & governmental subsidies	◔	↗	↗	↑	↗	↘	↗	> All focus regions have building energy efficiency regulations in place – UK customers strongly benefit from governmental housing initiatives
	Prefabricated	E	Planning security	◕	——— ↗ ———						> Customers increasingly value planning security regarding budget and move-in date – Prefab constructions usually outperform solid ones
		F	Construction period	◔	→	↗	↗	→	→	↗	> Prefabricated housing significantly reduces the construction time, given an effectively managed order backlog at manufacturers
		G	Technology acceptance	◑	↗	↗	↗	↗	↗	→	> Technology acceptance for prefabricated houses is increasing across focus regions – Prefab houses are increasingly seen to be modern
	Turn-key	H	One-stop shop solution	◕	↗	↗	↗	↗	↗	→	> One partner from design to construction facilitates the entire process and thereby reduces the possibility of errors especially for individuals
Price		I	Price of prefabricated turnkey houses	●	——— ↗ ———						> Prefab turnkey house prices are driven by wages and to a lesser extent material prices – Increase in wages leads to price increases
Overall					↗	↗	↗	↗	↗	↗	> **Overall, favorable trends for the prefabricated housing market in the focus regions**

● High relevance ○ Low relevance ↑ Positive influence ↓ Negative influence

Source: Interviews, Roland Berger

All focus countries are forecast to show positive GDP growth rates, averaging to c.2% p.a. between 2017 and 2022

Comparison of real GDP development, 2010-2022 [%, indexed[1)]]



	CAGR '14-'17	CAGR '17-'22
Poland	3.7%	3.1%
Norway	1.7%	1.8%
United Kingdom	1.9%	1.8%
Denmark	1.9%	1.8%
Switzerland	1.2%	1.8%
Sweden	3.5%	1.8%
Austria	1.8%	1.6%
Germany	2.0%	1.5%

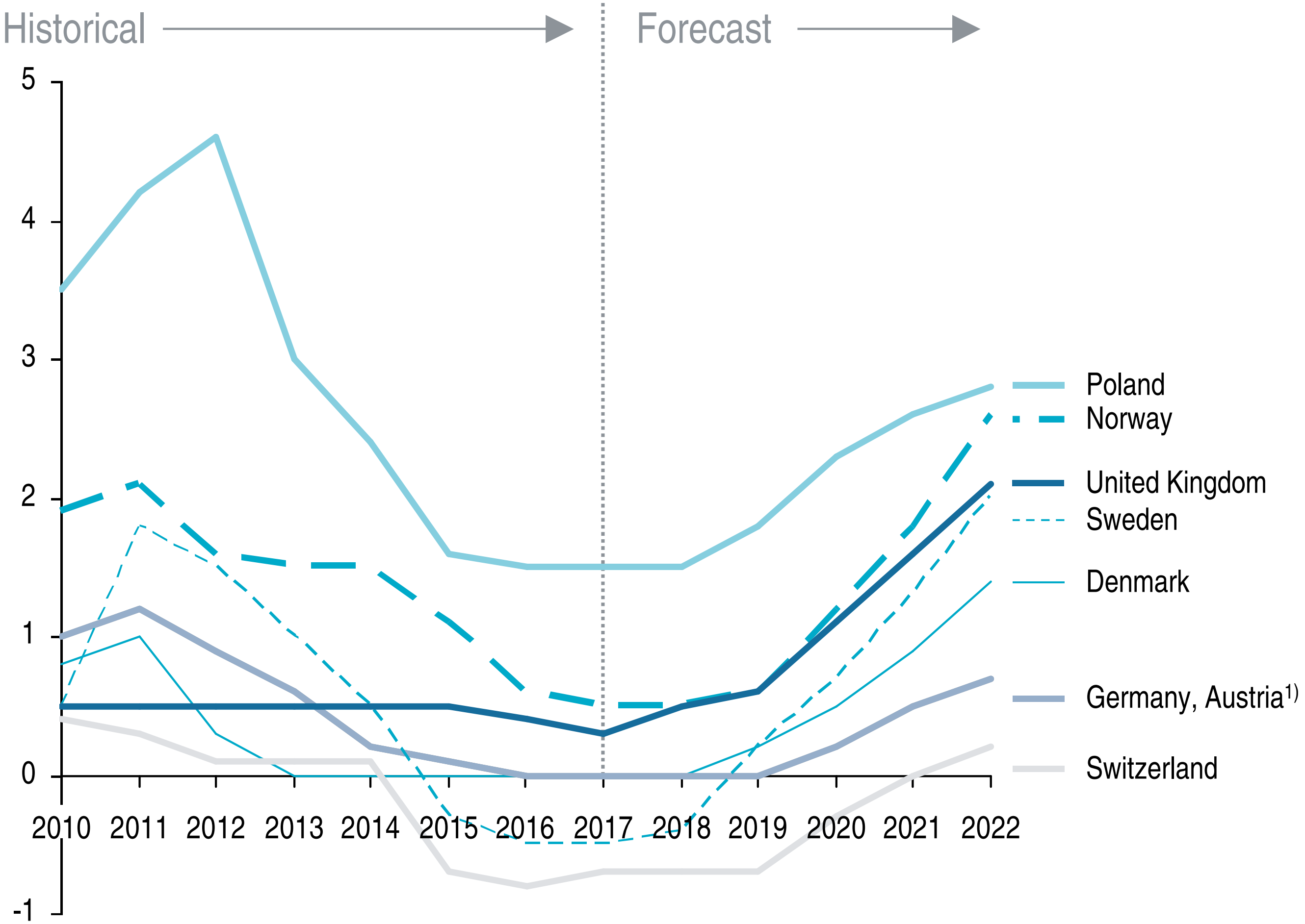
- For Germany, a favorable and stable GDP development of 1.5% p.a. by 2022 has been forecast mainly due to
  - Favorable financing and investment conditions
  - Construction activity and further public investments
  - Strong labor market
- The economy in Poland is expected to outperform that of other focus countries, particularly due to
  - Transfer of EU funds and increased investments
  - Strong labor market driving private consumption (also through government transfers)
- GDP forecasts for the UK remain difficult as the full effects of Brexit are not yet clear – However, low interest rates still provide a good climate for investments

1) Index: 2017 = 1.00

Source: Oxford Economics, World Bank, Roland Berger

Interest rates are currently at a historically low level and expected to moderately increase from 2019 onwards

Interest rates: Central bank rates, 2010-2022 [%]



> *"Extremely cheap money is certainly one of the drivers of the higher value of new 1+2 family houses constructed in Sweden"*
> **Manufacturer**

> *"Interest rates only determine the industry development to a limited extent. I would not expect a direct effect if interest rates go up by 1-2% again"*
> **Manufacturer**

> *"In the UK, the help-to-buy scheme provides access to cash for extremely low rates – This certainly helps"*
> **Manufacturer**

> *"Expected interest rate increases will mostly impact the low-price segment as these people are most reliant on cheap loans"*
> **Manufacturer**

> *"Interest rates certainly have an influence but need to be assessed always in combination with land prices – I would not be worried about an increase in interest rates by 2-3%, as I would expect land prices to stabilize"*
> **Market expert**

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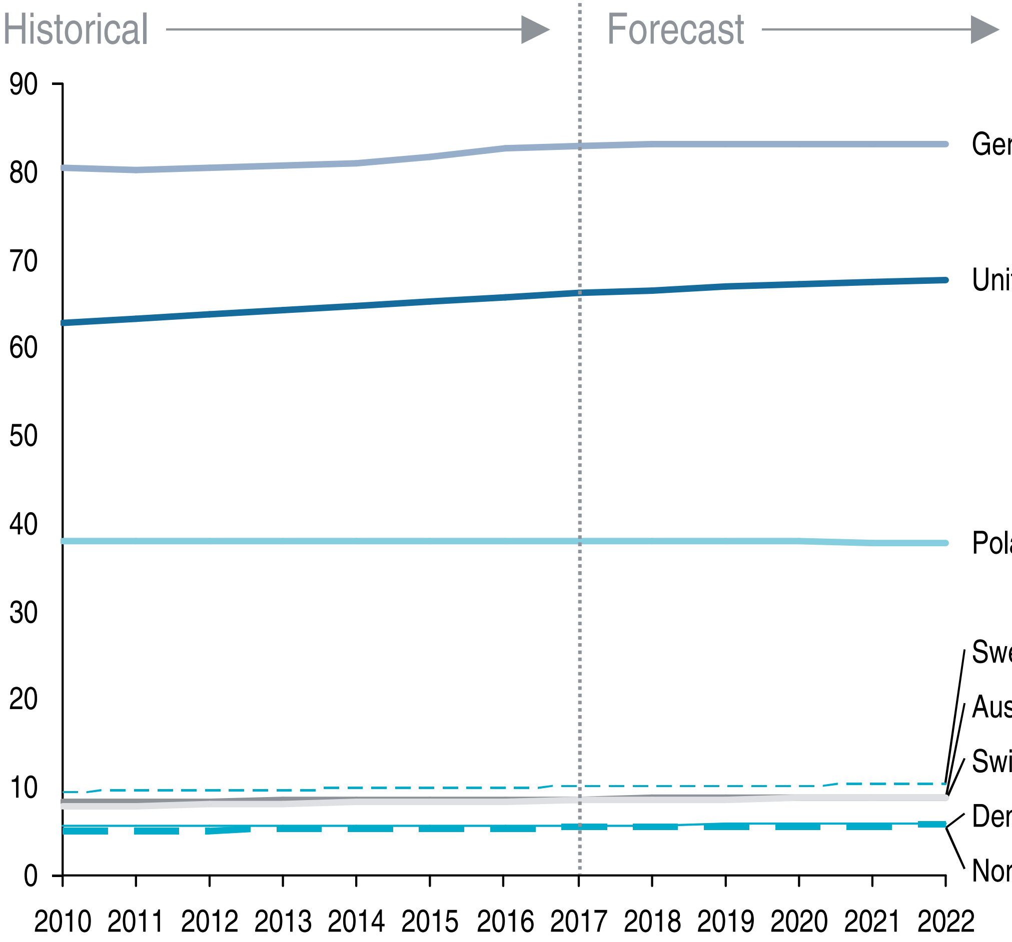
1) Common EUR interest rate

Source: Oxford Economics, Roland Berger

Overall, the focus countries are forecast to show minor population increases or remain largely stable in the upcoming years

Population: Inhabitants per country, 2010-2022 [m]



	CAGR '14-'17	CAGR '17-'22
Germany	0.9%	0.0%
United Kingdom	0.7%	0.5%
Poland	0.0%	-0.1%
Sweden	0.9%	0.6%
Austria	0.6%	0.5%
Switzerland	1.1%	0.9%
Denmark	0.6%	0.3%
Norway	0.9%	0.9%

- > The overall population level of focus countries is expected to remain at a largely stable level in the upcoming years
- > Germany, which has experienced a moderate increase of its population in the past decade, is forecast to be flat on this indicator going forward

Source: Oxford Economics, Roland Berger

Energy efficiency regulations available in all focus regions are likely to positively impact the prefabricated housing markets, esp. in the UK

Overview of energy efficiency regulations & governmental subsidies

	Germany	**Scandinavia**	**UK**	**Austria & Switzerland**	**Poland**
Key regulations & governmental subsidies	> German Energy Saving Ordinance (EnEV)	> In Norway: Energy efficiency regulations (TEK10) > Across Scandinavia, the high tax rates on electricity support timber-frame solutions	> Self and Custom Build Housing Act 2015 > Government's Housing and Planning Bill	> In 2013, a referendum led to the restriction that only 20% of homes in holiday areas can be used as second homes	> Increasingly strict energy efficiency regulations for newly constructed buildings > Governmental support programs favor flats and developer-built houses
Market feedback	*"At the moment, there is no dedicated governmental subsidy program in place for prefabricated houses"* **Manufacturer** *"Higher energy efficiency requirements increasingly support the prefabricated market segment"* **Market expert**	*"Across Scandinavia, the prefabricated segment is historically very strong – There is simply no need for the government to further support the industry through subsidies"* **Manufacturer**	*"Prefab housing manufacturers benefit from governmental programs to increase and facilitate access to new housing"* **Manufacturer** *"The ecological trend and focus on energy efficiency will favor prefabricated houses"* **Market expert**	*"In Switzerland, canton regulations favor local companies. However, the referendum on second homes limits 1+2 family prefabricated housing constructions. In Austria, I believe no subsidy programs are in place"* **Manufacturer**	*"There are programs that aim at increasing the number of energy-efficient and passive houses in Poland with funds secured until 2022"* **Manufacturer**
Influence	↗	↗	↑	↘	↗

↑ Positive influence ↓ Negative influence

Source: Interviews, Roland Berger

Market feedback revealed planning security and comfort level to be a key driver in the purchasing decision for prefabricated houses

Market feedback – Planning security

Germany

"I value the reliability of house cost estimations. Once the contract is signed the house price is fixed"
Customer

"Market players use the promise to reliably deliver the house on a pre-agreed date as a means of attracting customers"
Market expert

"When deciding for a prefabricated house and against on-site construction, planning security is a key driver"
Manufacturer

↗

Scandinavia

"When deciding on my house, I was in contact with 5 companies. All of them provided me with detailed information on potential move-in dates. Planning security was definitely a strong criterion for my choice"
Customer

"One of the drivers of the Norwegian prefabricated housing market is certainly planning security. Customers really look for a concrete date when they can move in, which we can offer"
Manufacturer

↗

UK

"Our customers of prefabricated houses know exactly what they get from us. We offer homes that are highly precise and accurate, without any heat-loss and absolutely air-tight. This offers a very high quality level to customers"
Manufacturer

"Knowing the exact move-in date helped us to plan and organize moving out of our previous home. Additionally, we appreciated the possibility to agree upon a reliable house construction budget upfront"
Customer

↗

Austria & Switzerland

"I would always prefer a prefabricated house after having had horrible experiences with architects not meeting deadlines"
Customer

"Compared with competition from on-site 1+2 family projects, we can certainly offer higher planning security. Our building process is routine-based, guaranteeing delivery at a promised point in time"
Manufacturer

"Knowing exactly what you need to pay upfront is a key advantage for our clients"
Manufacturer

↗

Poland

"Customers value the fact that they have to deal with only one party during the construction process within agreed deadlines and budget"
Manufacturer

"All construction dates are agreed beforehand. Customers know what to expect and within what timeframe – It definitely increases planning security"
Manufacturer

"Knowledge of the exact price before construction is a great advantage that increases the comfort level"
Manufacturer

↗

↑ Positive influence ↓ Negative influence

Source: Interviews, Roland Berger

Prefabricated housing significantly reduces the construction time, given an effectively managed order backlog at manufacturers

Overview of construction period of prefabricated vs. solid houses

Indicative

Prefabricated – Overall time: 3-4 months (accumulated time)

2 weeks	> **Foun-dations**
2-3 days	> **House elements** prefabricated
1-2 days	> **Transport** by truck
1-2 days	> **Assembly** (including roofing)
***Total**: 1 month*	> **Shell-finished**
***Total**: 2 months*	> **Floor-covering**
***Total:** c.3 months*	> **Turnkey:** The finishing, fixtures and fittings are ready

> *"Although lead times might be significantly longer, construction of prefabricated houses can be performed within 3-4 months, offering a considerable advantage over on-site construction projects"*
>
> **Manufacturer**

> *"Due to the long backlog of many industry players, there is currently limited advantage in construction time for prefabricated buildings, esp. in the DACH region"*
>
> **Market expert**

Solid on-site – Overall time: 6-8 months (accumulated time)

3 weeks	> Cellar & foundations
4 weeks	> Masonry works
4 weeks	> Roof, windows, doors
***Total**: 3 months*	> **Shell-finished**
***Total**: 4-5 months*	> **Floor-covering**
***Total**: >6 months*	> **Turnkey:** The finishing, fixtures and fittings are ready

Note: Planning/design not taken into account; best-case scenario shown

Source: Immonet, Roland Berger

Market feedback on prefabricated houses suggests increasing acceptance of and demand for modern and individual solutions

Market feedback – Technology acceptance

Germany

"Key players have enlarged and personalized their portfolio – This has helped to increase the acceptance level"
Manufacturer

"Prefabricated construction style is just the better and more modern way with regard to energy efficiency and fulfillment of regulatory requirements"
Manufacturer

"The possibility to introduce individual adjustments is key in winning new customers against on-site construction"
Manufacturer

↗

Scandinavia

"In Denmark, prefabricated houses are typically non-timber-frame solutions. I expect, however, a slightly increasing trend towards timber-frame in the future"
Manufacturer

"In Sweden, we are European leaders in prefabricated technology. People appreciate the high energy efficiency"
Market expert

"In general, the Scandinavians simply like timber-frame buildings based on their architectural tastes"
Manufacturer

↗

UK

"They have a modern and luxurious product offer. I would not hesitate to buy a new house from them if I needed one in the future"
Manufacturer

"Prefabricated houses are quite a convenient product. Furthermore, it can be a solution to the rapid retirement rate of UK construction workers"
Manufacturer

"We've shown that there is a demand for prefabricated houses, we have shown that quality levels are high, and it's therefore becoming increasingly accepted"
Market expert

↗

Austria & Switzerland

"Neighbors and friends have already asked me a couple of times who I built my prefabricated house with, as it looks modern and quite unique"
Customer

"I am a satisfied customer of a prefabricated house in Switzerland, yet sometimes I am a bit jealous when I see the development and options available nowadays in the prefabricated housing market"
Customer

↗

Poland

"Prefabricated houses are not yet widely accepted"
Market expert

"In Poland, prefabricated houses were historically associated with lower quality, yet nowadays people increasingly realize & appreciate their quality"
Manufacturer

"The acceptance of timber-frame prefabricated houses is relatively low but we see an increased interest in this technology, as customers have been approaching us more frequently in the last 2-3 years"
Manufacturer

→

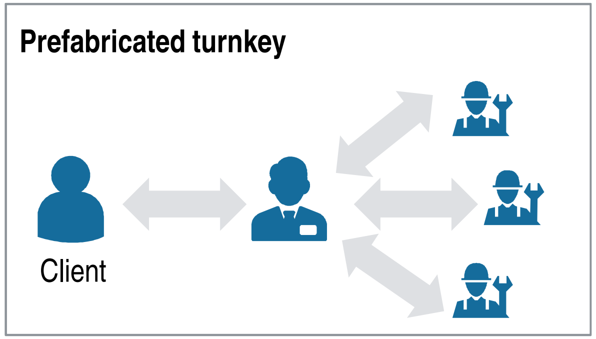
↑ Positive influence ↓ Negative influence

Source: Interviews, Roland Berger

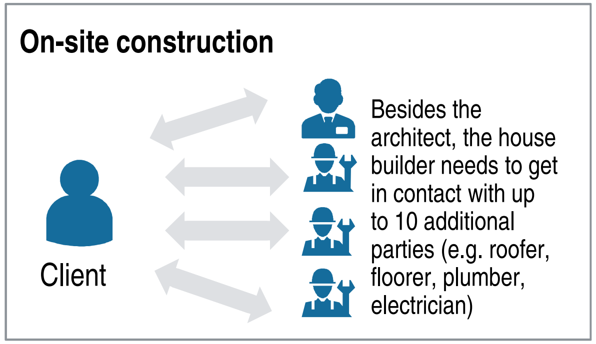
The prefabricated turnkey one-stop shop approach offers convenience and requires less personnel time and resources

Overview of prefabricated turnkey vs. solid construction: One-stop shop

One-stop shop



VS.



Besides the architect, the house builder needs to get in contact with up to 10 additional parties (e.g. roofer, floorer, plumber, electrician)

"Convenience is a strong driver of prefabricated and turnkey house development – One single point of contact and high reliability are very attractive for customers"

Manufacturer

"Prefab turnkey one-stop shop offers high convenience, whereas during conventional on-site constructions, assignment of up to 10 parties could become a very lengthy and tedious process"

Manufacturer

"When I decided for my second home in Switzerland, I just wanted to have one point of contact. For me, it was of utmost importance that my involvement in the process was limited. As a businessman, I simply do not have the time"

Customer

"As many of our customers are families with both parents working, we see that one-stop shop solutions are increasingly valued. People have less time for planning and overseeing the construction process of their house. This is why we offer the necessary support"

Manufacturer

"In Poland, the process of making houses turnkey is typically supported by families, neighbors and friends. People are very skilled, so they do not need to assign a company for everything"

Market expert

"Especially for people that lack time and are not born craftsmen, one-stop shop offers significant advantages"

Manufacturer

"Building a house and organizing all necessary process steps can be quite cumbersome. I really appreciated having one point of contact that guides me through the process"

Customer

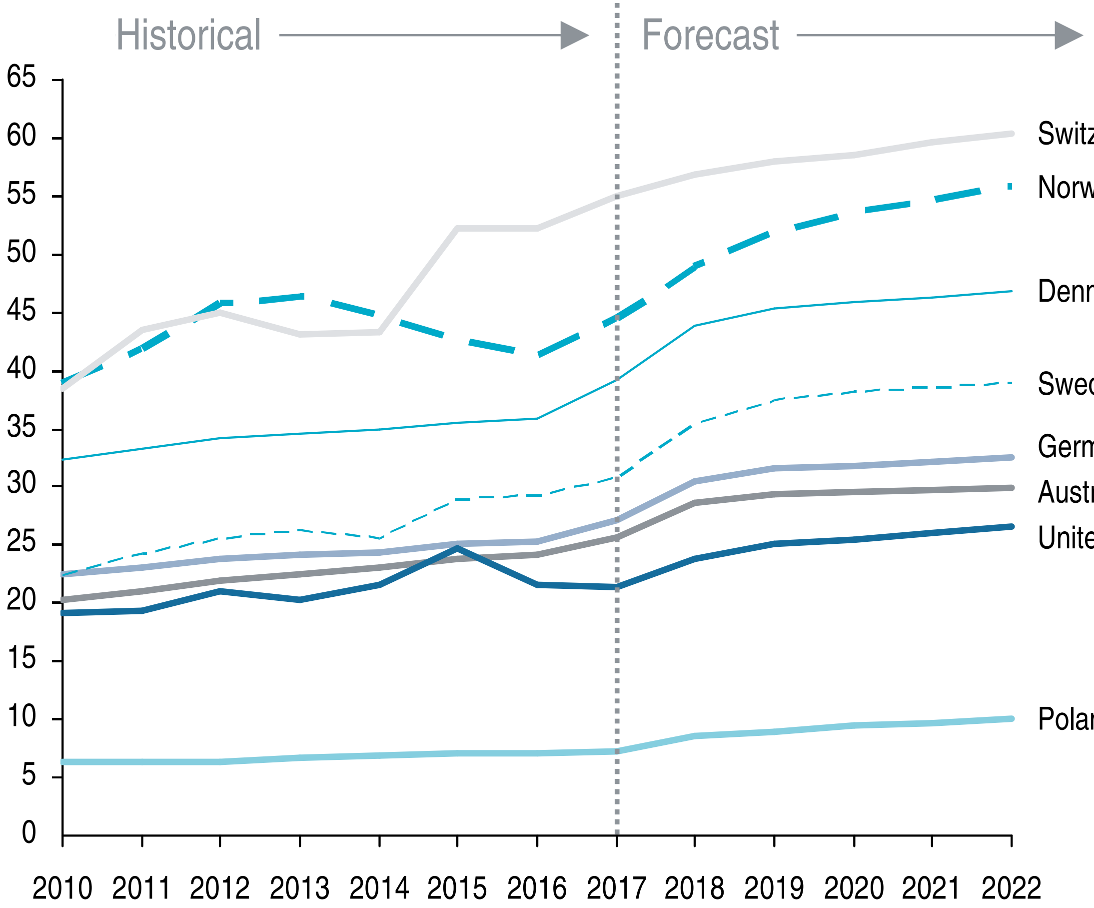
"All across Europe, we see a trend that individuals are less savvy when it comes to house building. The work that people in the past could do on their own often needs to be provided by companies now"

Market expert

Source: Interviews, Roland Berger

Due to the strong economic development, average wages are expected to grow strongly, supporting growth in house prices

Comparison of wages per hour[1)2)], 2010-2022 [EUR/h]



	CAGR '14-'17	CAGR '17-'22
Switzerland	8.3%	2.0%
Norway	0.0%	4.7%
Denmark	3.9%	3.6%
Sweden	6.3%	4.8%
Germany	3.6%	3.7%
Austria	3.6%	3.1%
United Kingdom	-0.2%	4.4%
Poland	2.5%	6.6%

- > Inflation rates have led to an increase in average wage levels and material prices
- > Further acceleration of wage dynamics is expected, especially in Poland, Sweden and Norway

> *"There are basically two main factors influencing the prices of housing: Wages, which are expected to increase in the coming years, and to a lesser extent material costs"*
>
> **Market expert**

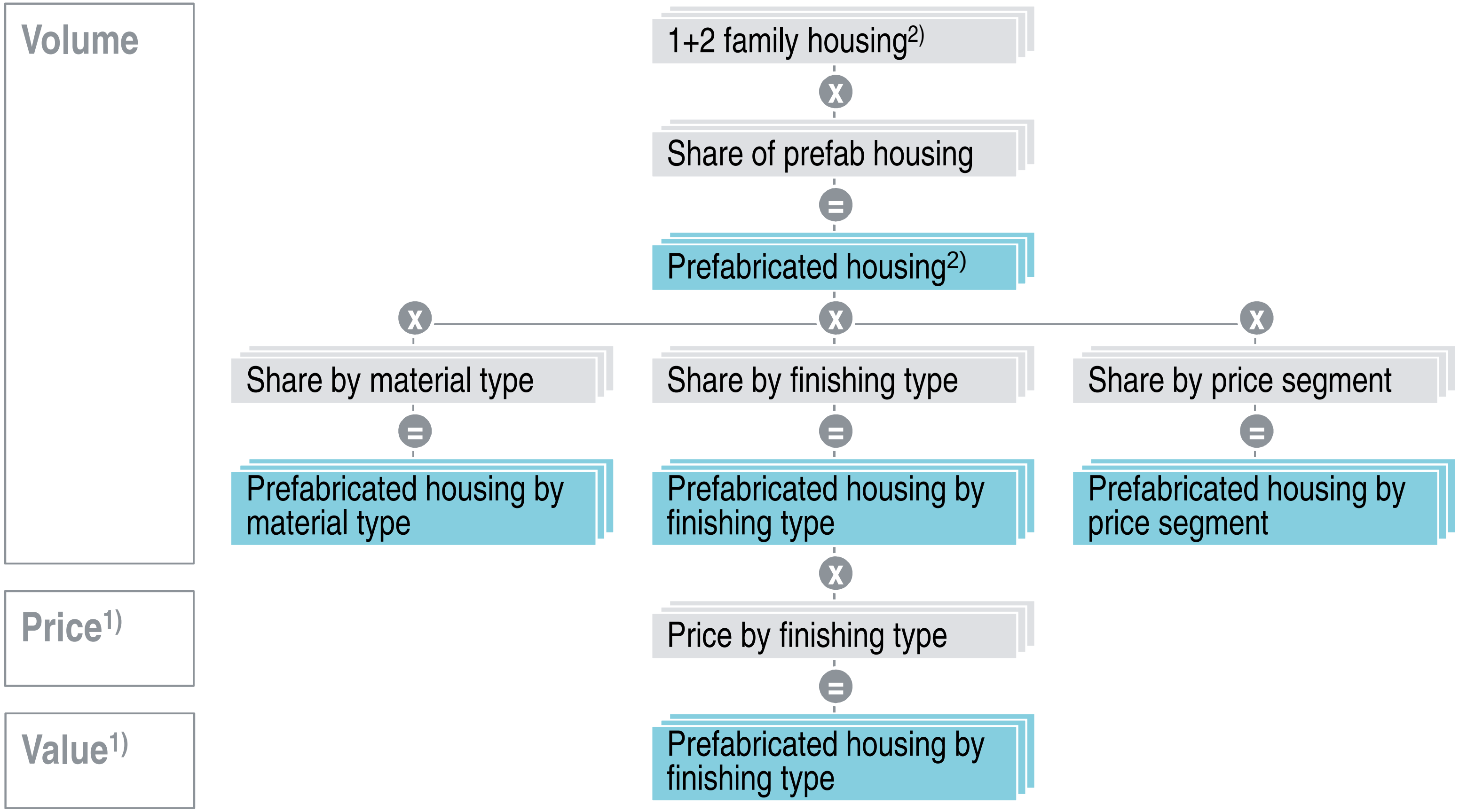
1) Direct pay and social insurance expenditures and labor-related taxes (minus subsidies);
2) Nominal values – For Denmark, Norway, Poland, Sweden, Switzerland and the UK recalculated from local currency to EUR using floating average exchange rates

Source: Oxford Economics, Roland Berger

C. Market size and development

The prefabricated 1+2 family housing market has been derived via a market model, incorporating primary and secondary sources

Market model methodology



Methodology

Volume

1+2 family housing[2)]

x

Share of prefab housing

=

Prefabricated housing[2)]

x

Share by material type = Prefabricated housing by material type

Share by finishing type = Prefabricated housing by finishing type

Share by price segment = Prefabricated housing by price segment

x

Price[1)]

Price by finishing type

=

Value[1)]

Prefabricated housing by finishing type

Sources

Euroconstruct, national statistics, interviews

Interviews, project experience

Interviews, project experience

Interviews, project experience

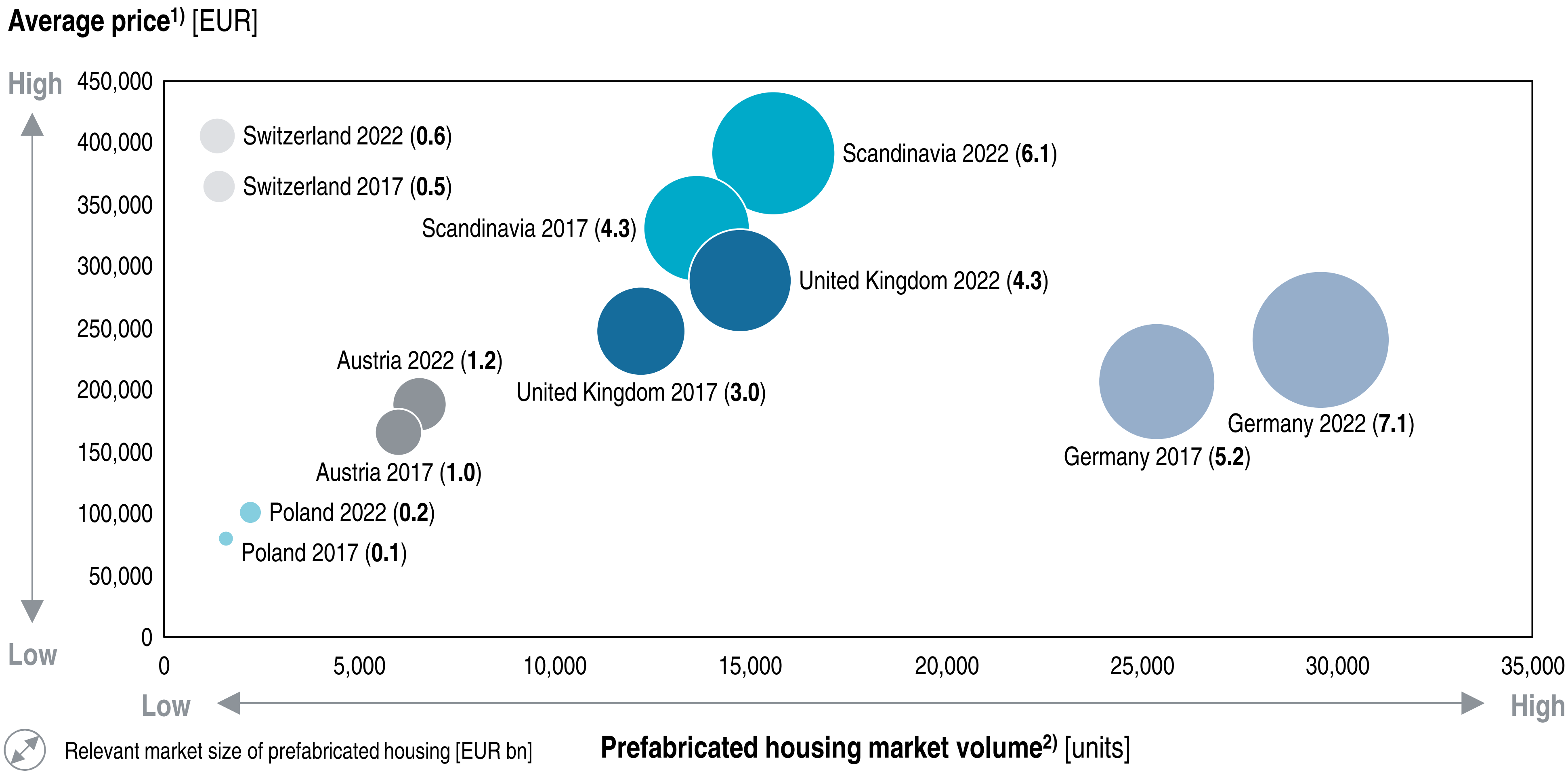
1) Nominal price and market value development; 2) Completed houses

■ Output ▭ Input ■ / ▭ By focus region

Source: Roland Berger

The market value of prefabricated 1+2 family housing is expected to grow across all focus regions between 2017 and 2022

Overview of market development, 2017 vs. 2022

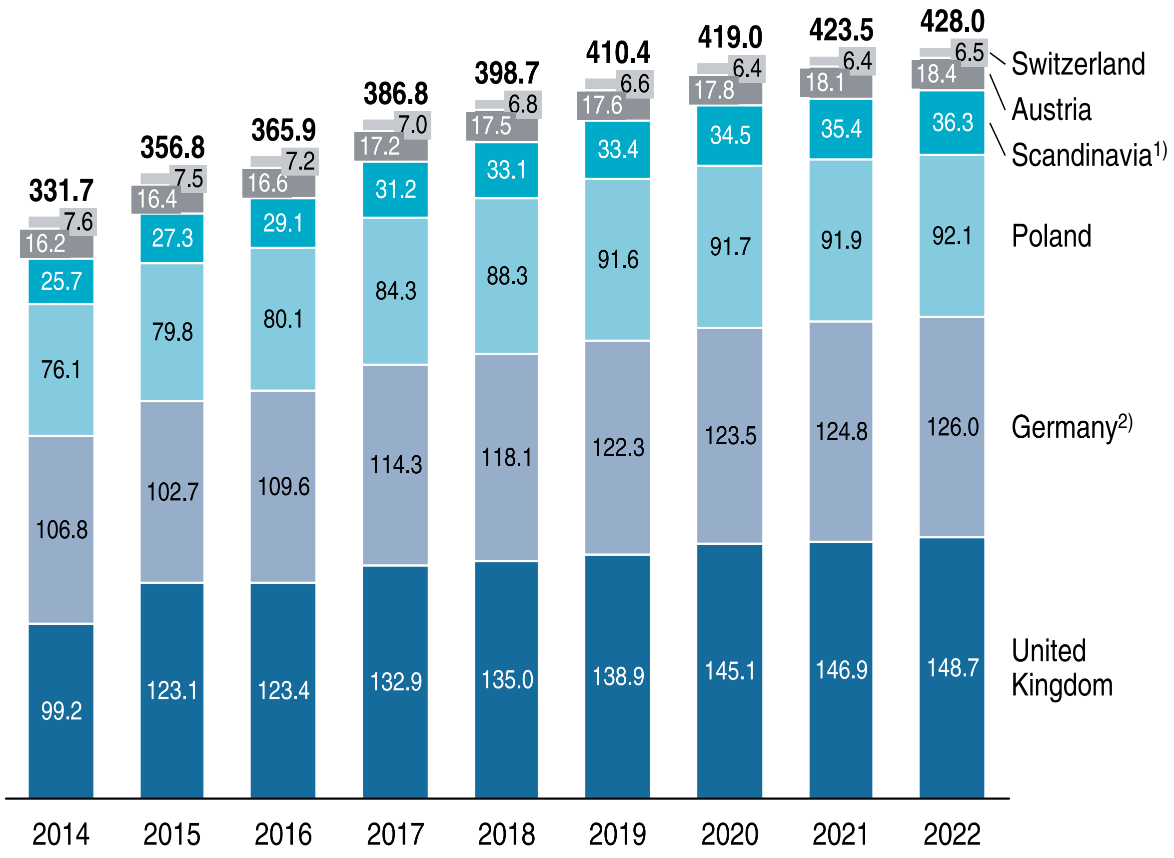


1) Average prefabricated 1+2 family housing prices used; 2) Completed 1+2 prefabricated family housing

Source: Euroconstruct, Interviews, Roland Berger

The market volume of 1+2 family housing is expected to continue its growth between 2017 and 2022 but at a slower pace

Market **volume** of 1+2 family housing, 2014-2022 [k units]



	CAGR '14-'17	CAGR '17-'22
	5.3%	2.0%
Switzerland	-2.6%	-1.6%
Austria	2.0%	1.4%
Scandinavia[1)]	6.6%	3.1%
Poland	3.4%	1.8%
Germany[2)]	2.3%	2.0%
United Kingdom	10.2%	2.3%

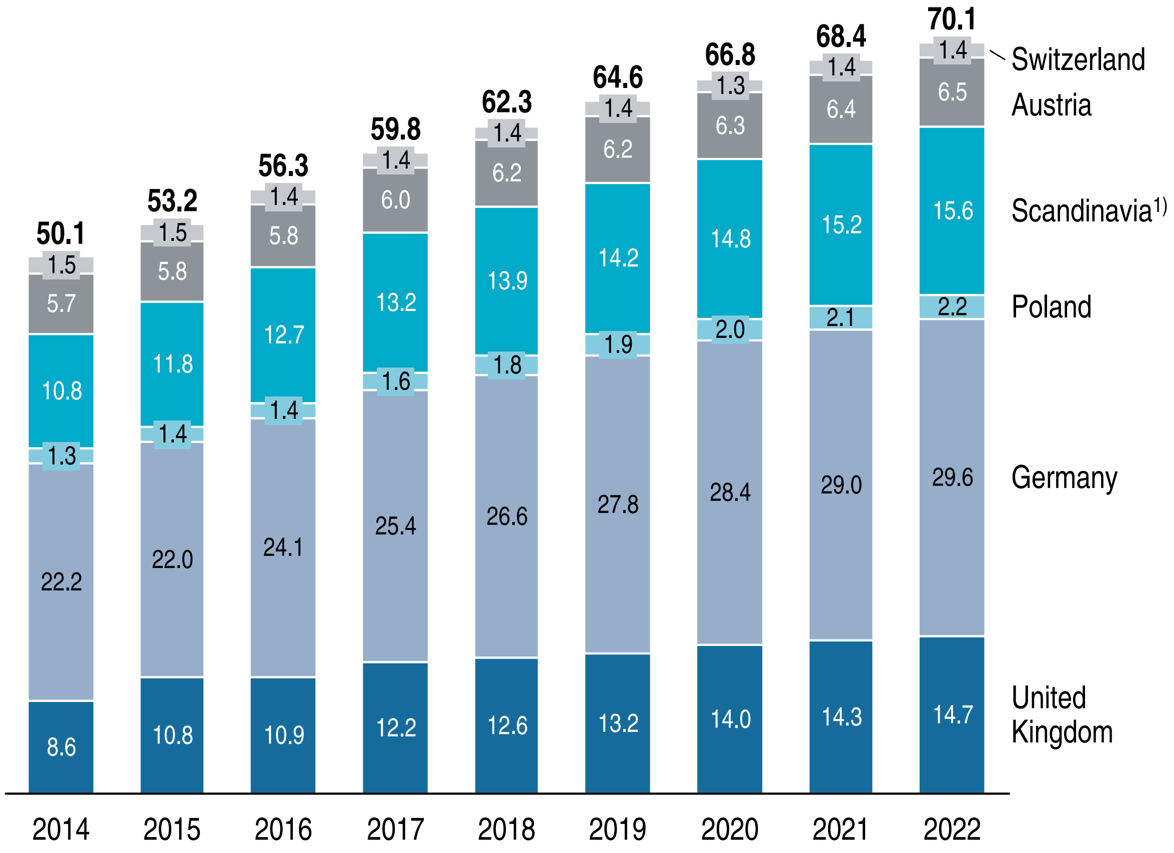
- The market volume of 1+2 family housing is forecast to display solid growth of c.2% p.a. from 2017-'22
- All focus regions display an expected increase in 1+2 family housing market volumes, except for Switzerland
- Geographically, the UK, Germany and Poland show the highest demand for 1+2 family housing in 2017 across all focus regions

1) Including Sweden, Norway and Denmark; 2) Market volume development of 1+2 family housing in Germany based on interviews

Source: Euroconstruct, Swedish National Statistics, Interviews, Press research, Roland Berger

Among 1+2 family housing, prefabricated housing is expected to gain in relevance, growing at c.3% p.a. from 2017 to 2022

Market **volume** of prefabricated housing, 2014-2022 [k units]



	CAGR '14-'17	**CAGR '17-'22**
	6.1%	**3.2%**
Switzerland	-1.7%	-0.6%
Austria	1.9%	1.6%
Scandinavia1)	6.9%	3.5%
Poland	7.6%	6.9%
Germany	4.6%	3.1%
United Kingdom	12.2%	3.8%

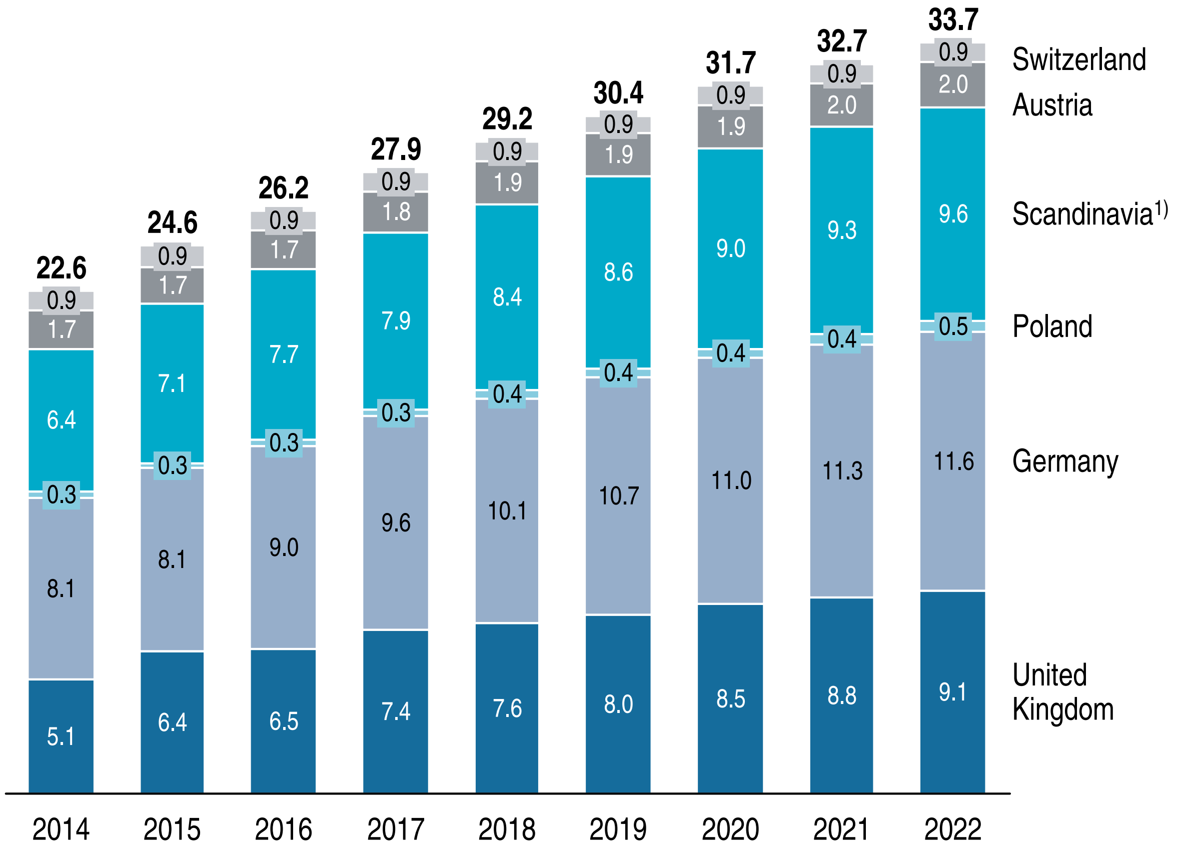
1) Including Sweden, Norway and Denmark

- \> Prefabricated housing growth is expected to outpace the 1+2 family housing market
- \> Geographically, absolute growth is projected to be driven by Germany, the UK and Scandinavia
- \> The UK is expected to be negatively impacted by Brexit and is forecast to grow stably but well below strong historical growth figures
- \> In Poland, prefabricated housing is currently assumed to be less popular than in other focus regions – Some catch-up effect anticipated going forward, underpinned by strong growth until 2022

Source: Euroconstruct, Interviews, Press research, Roland Berger

Within prefabricated 1+2 family housing, there is a trend towards turnkey solutions with convenience and security as key drivers

Market **volume** of prefabricated turnkey housing, 2014-2022 [k units]



	CAGR '14-'17	CAGR '17-'22
	7.3%	**3.8%**
Switzerland	-1.5%	-0.2%
Austria	2.1%	2.0%
Scandinavia[1)]	7.2%	3.8%
Poland	8.8%	7.9%
Germany	5.6%	4.0%
United Kingdom	12.8%	4.3%

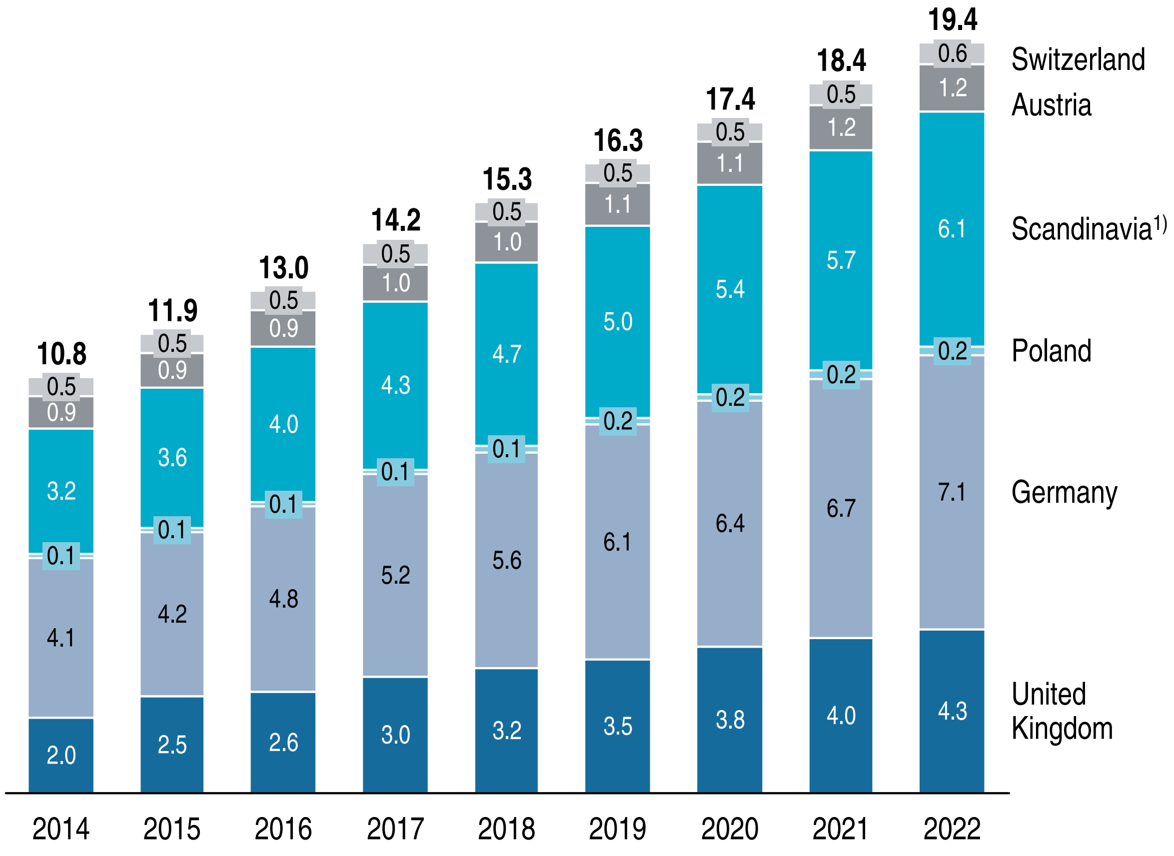
- The share of turnkey solutions is projected to outgrow the prefabricated housing market
- This development is expected to be driven by a growing demand for convenience and security (provision of guarantee) across all focus regions
- Germany, followed by Scandinavia and the UK are the largest prefabricated turnkey housing markets

1) Including Sweden, Norway and Denmark

Source: Euroconstruct, Interviews, Press research, Roland Berger

The market value of prefabricated 1+2 family housing is projected to grow faster than volume growth due to favorable pricing trends

Market **value** of prefabricated housing, 2014-2022 [EUR bn]



	CAGR '14-'17	**CAGR '17-'22**
	9.7%	**6.4%**
Switzerland	1.3%	1.5%
Austria	4.8%	4.2%
Scandinavia[1)]	10.4%	7.0%
Poland	11.5%	11.8%
Germany	8.1%	6.3%
United Kingdom	15.4%	7.1%

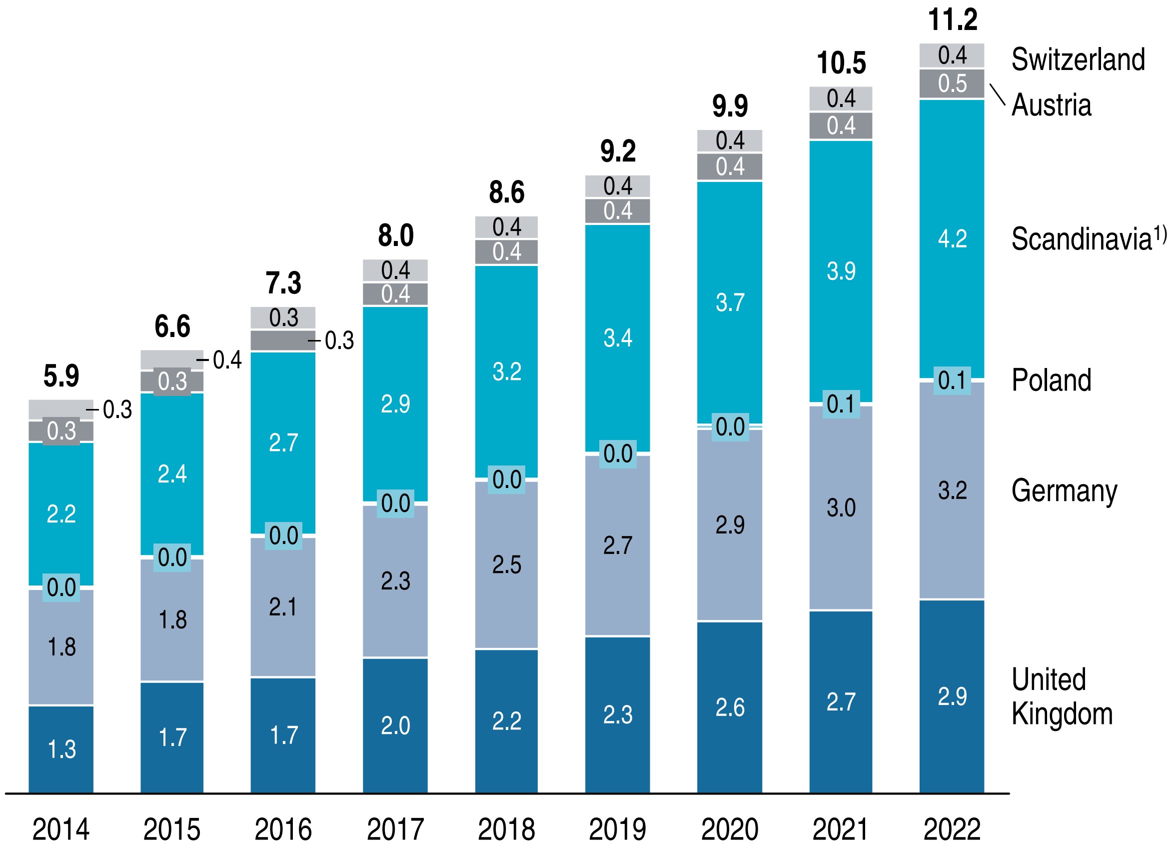
- > The market value of prefabricated 1+2 family housing is expected to grow faster than volume growth due to
  - – Shift towards turnkey solutions with 20-30% higher average prices (greater value added) vs. floor-covering
  - – Favorable pricing trends due to growing wage levels across all focus regions
  - – Positive region mix effects (Scandinavia and the UK with above average price level and market growth)

1) Including Sweden, Norway and Denmark

Source: Euroconstruct, Interviews, Press research, Roland Berger

Turnkey solutions account for more than 50% of the prefabricated 1+2 family housing market and are forecast to outgrow the market

Market **value** of prefabricated turnkey housing, 2014-2022 [EUR bn]



		CAGR '14-'17	CAGR '17-'22
		10.6%	**7.0%**
Switzerland	F	1.5%	1.8%
Austria	E	5.0%	4.6%
Scandinavia[1]	D	10.6%	7.4%
Poland	C	12.6%	12.8%
Germany	B	9.1%	7.1%
United Kingdom	A	15.8%	7.5%

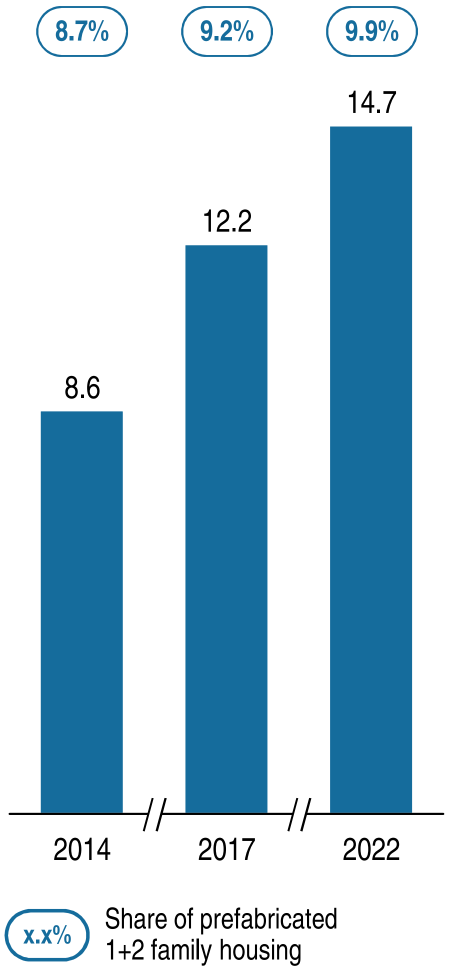
- Within prefabricated 1+2 family housing, turnkey solutions are clearly the prevailing finishing type (share of more than 50%)
- Turnkey solutions are projected to outgrow the prefabricated housing market by growing at c.7% p.a. from 2017 to 2022
- Scandinavia, followed by Germany and the UK are the largest prefabricated turnkey housing markets in value terms

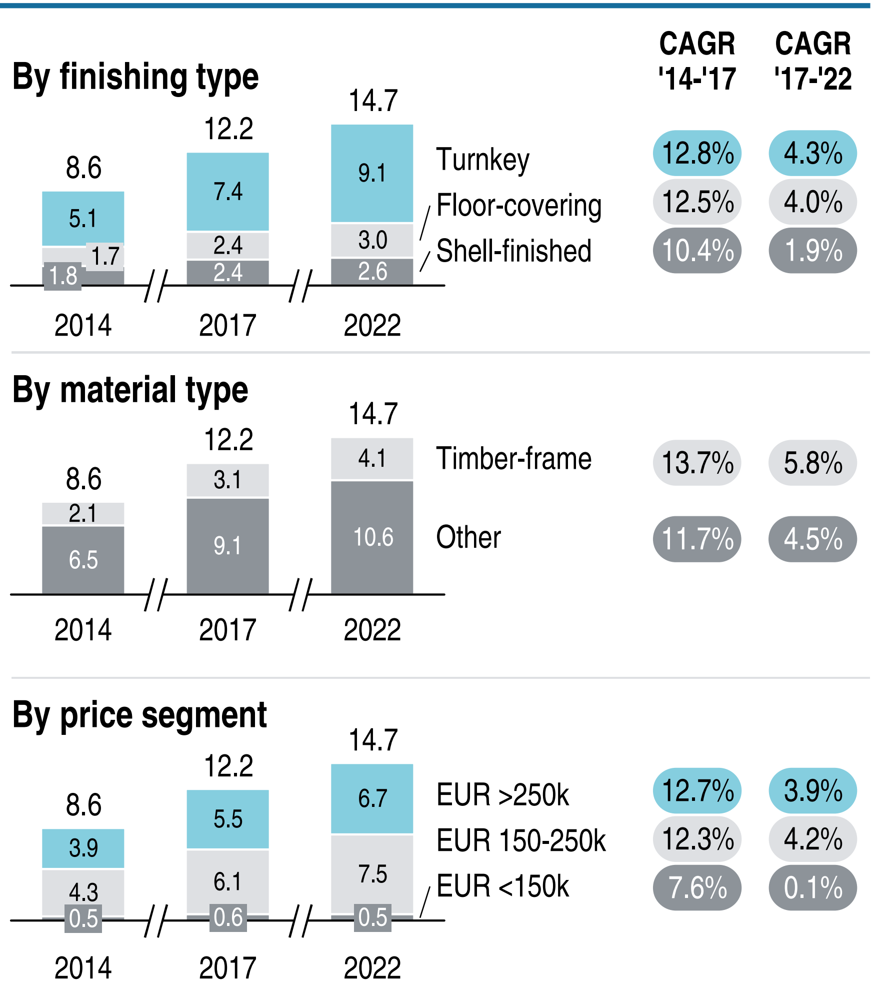
1) Including Sweden, Norway and Denmark

Source: Euroconstruct, Interviews, Press research, Roland Berger

The prefabricated housing market in the UK is characterized by a large share of turnkey solutions and houses above EUR 150 k

Market **volume** of prefabricated housing, 2014-2022 [k units]



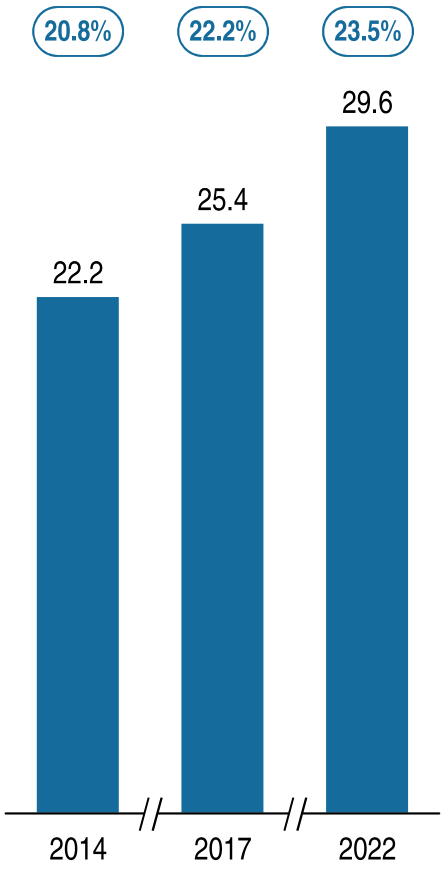


- The significant historical increase in market volume of prefabricated housing in the UK from 2014 to 2016 was driven by
  - Governmental support
  - Housing shortage
- The trend towards turnkey solutions is further fueled by a shortage of craftsmen and a growing demand for security and convenience
- Within the UK, Scotland is believed to have a very high share of timber-frame construction of c.75%
- The vast majority of houses cost in excess of EUR 150 k

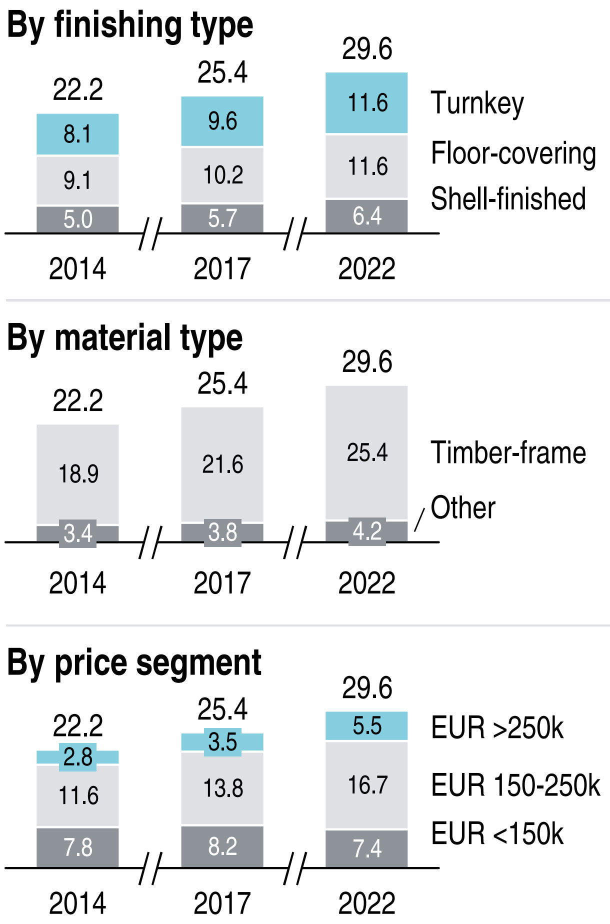
Source: Euroconstruct, Interviews, Press research, Roland Berger

In Germany, prefabricated turnkey housing is expected to grow strongest until 2022 – Timber-frame is the prevailing material type

Market **volume** of prefabricated housing, 2014-2022 [k units]



x.x% Share of prefabricated 1+2 family housing



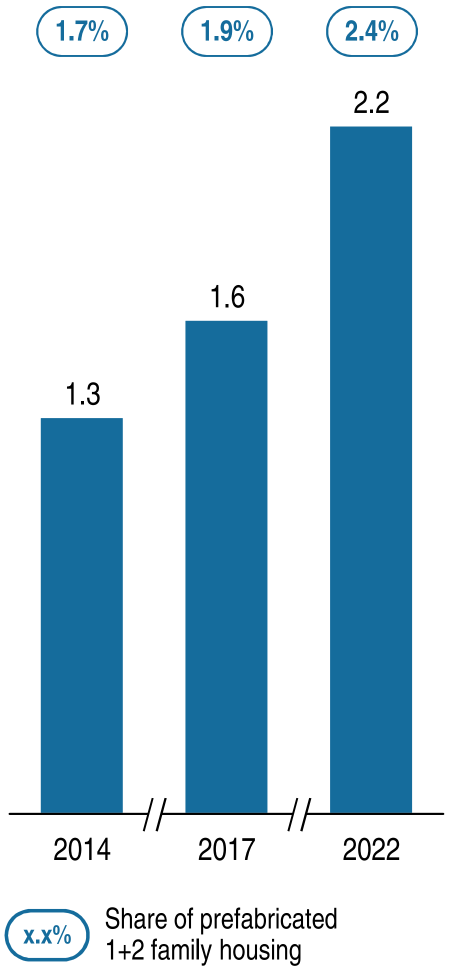
	CAGR '14-'17	CAGR '17-'22
By finishing type		
Turnkey	5.6%	4.0%
Floor-covering	3.8%	2.6%
Shell-finished	4.2%	2.4%
By material type		
Timber-frame	4.7%	3.3%
Other	3.9%	2.1%
By price segment		
EUR >250k	7.4%	9.8%
EUR 150-250k	5.9%	3.9%
EUR <150k	1.3%	-2.1%

- Prefabricated housing growth is expected to outpace the 1+2 family housing market
- Within prefabricated housing, turnkey solutions are projected to grow strongest in the upcoming years
- Timber-frame is the prevailing material type of prefabricated housing and is expected to further gain in relevance – This development is supported by the increasing relevance of sustainability and ecological structures
- The mid-price segment (EUR 150-250 k) is forecast to show the strongest absolute growth

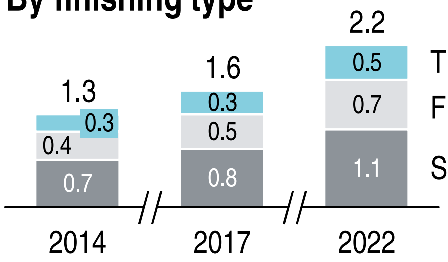
Source: Euroconstruct, Interviews, Press research, Roland Berger

The Polish market for prefabricated housing appears very price-sensitive and mainly focused on shell-finished housing

Market **volume** of prefabricated housing, 2014-2022 [k units]

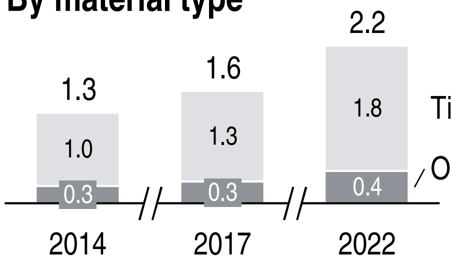


By finishing type



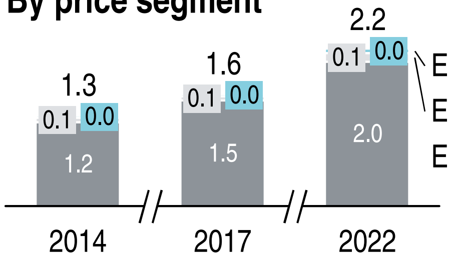
	CAGR '14-'17	CAGR '17-'22
Turnkey	8.8%	7.9%
Floor-covering	8.4%	7.6%
Shell-finished	6.6%	6.0%

By material type



	CAGR '14-'17	CAGR '17-'22
Timber-frame	7.6%	6.9%
Other	7.6%	6.9%

By price segment



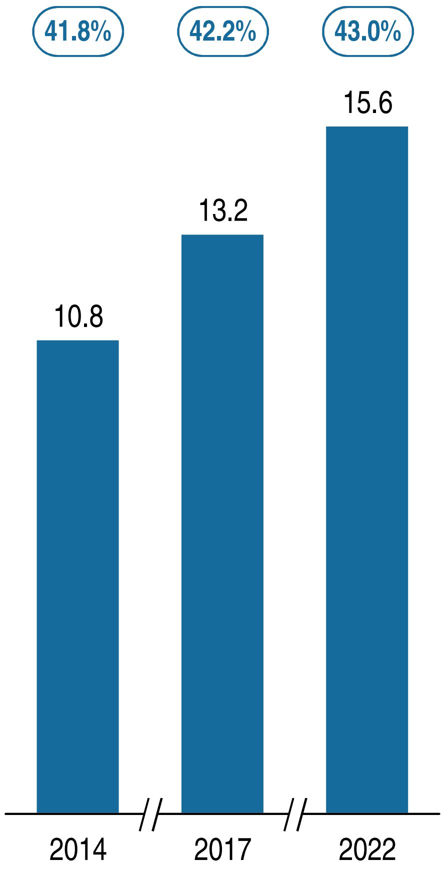
	CAGR '14-'17	CAGR '17-'22
EUR >250k	8.3%	9.0%
EUR 150-250k	8.5%	10.3%
EUR <150k	7.4%	6.7%

- In Poland, the prefabricated housing market is dominated by shell-finished solutions – Local people seem to have the required skill set to perform internal finishing themselves
- However, with younger generations of Poles being less technically savvy, other finishing types are gaining in relevance
- The Polish market for prefabricated housing appears very price-sensitive with the vast majority of houses being below EUR 150 k
- Timber-frame is estimated to be the prevailing material type

Source: Euroconstruct, Interviews, Press research, Roland Berger

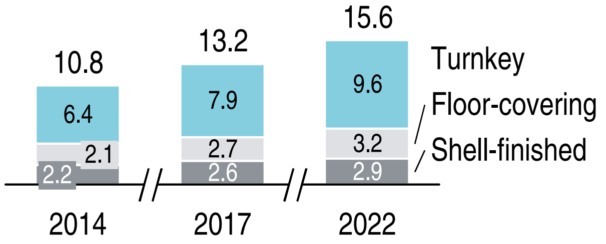
In Scandinavia, turnkey solutions and timber-frame constructions are the prevailing finishing type and material type, respectively

Market **volume** of prefabricated housing, 2014-2022 [k units]



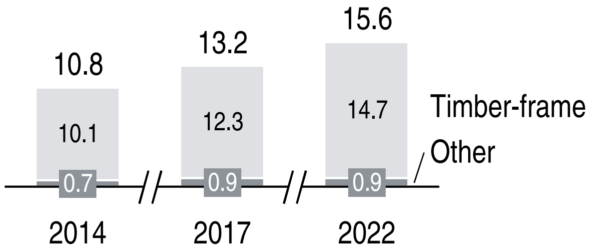
x.x% Share of prefabricated 1+2 family housing

By finishing type



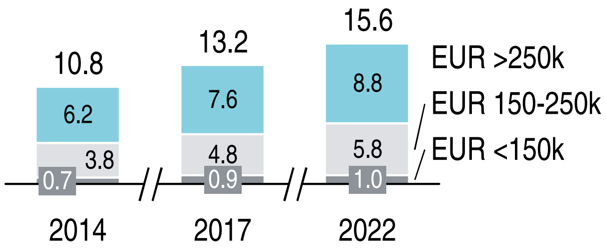
	CAGR '14-'17	CAGR '17-'22
Turnkey	7.2%	3.8%
Floor-covering	7.6%	3.6%
Shell-finished	5.4%	2.2%

By material type



	CAGR '14-'17	CAGR '17-'22
Timber-frame	7.0%	3.6%
Other	6.1%	2.1%

By price segment



	CAGR '14-'17	CAGR '17-'22
EUR >250k	6.9%	3.2%
EUR 150-250k	7.4%	4.0%
EUR <150k	5.4%	2.9%

- Compared to other focus regions, Scandinavia has an exceptionally high share of prefabricated housing (c.42% in 2017)
- Sweden accounts for the largest portion of the pre-fabricated housing market
- The prefabricated housing market in Scandinavia is dominated by the premium price segment and turnkey solutions
- Timber-frame is by far the dominant material type

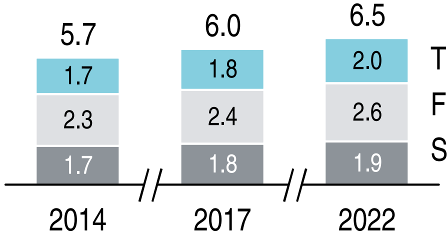
Source: Euroconstruct, Interviews, Press research, Roland Berger

The Austrian prefabricated housing market displays a good balance of finishing types – Timber-frame is the prevailing material type

Market **volume** of prefabricated housing, 2014-2022 [k units]

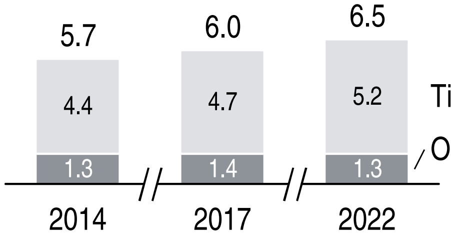
x.x% Share of prefabricated 1+2 family housing

By finishing type



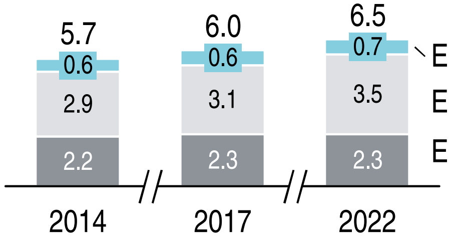
	CAGR '14-'17	CAGR '17-'22
Turnkey	1.1%	2.4%
Floor-covering	1.0%	2.2%
Shell-finished	0.6%	1.3%

By material type



	CAGR '14-'17	CAGR '17-'22
Timber-frame	1.2%	2.5%
Other	-0.1%	0.1%

By price segment



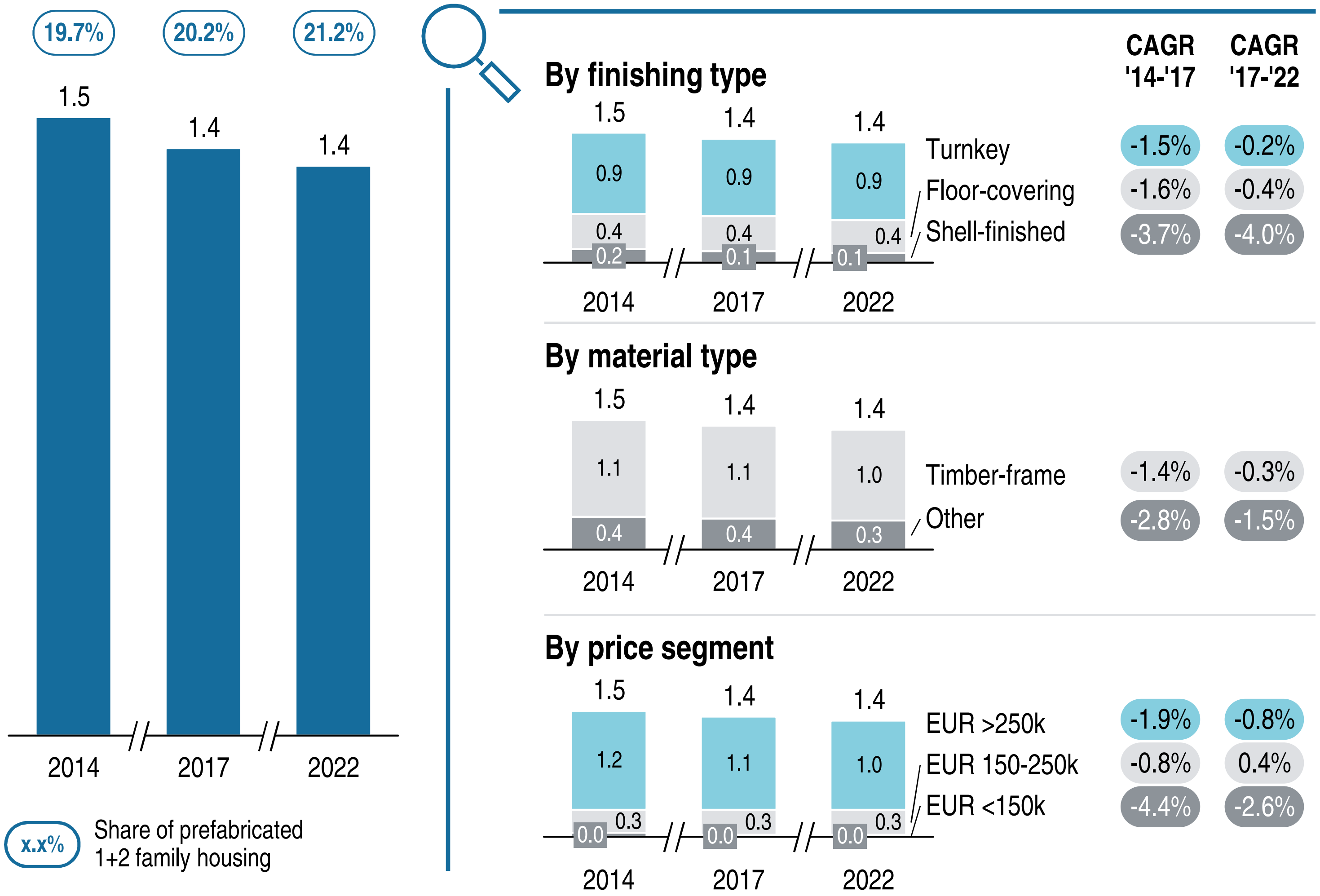
	CAGR '14-'17	CAGR '17-'22
EUR >250k	3.1%	1.6%
EUR 150-250k	2.9%	2.1%
EUR <150k	1.1%	0.3%

- Austria reveals a high share of prefabricated housing (c.35% in 2017) – The western part of Austria has a lower share than the eastern part of the country
- Prefabricated housing displays a good balance of different finishing types
- The mid-price segment is estimated to account for the largest share of prefabricated housing – The mid- and high-price segments are forecast to grow strongest in the upcoming years

Source: Euroconstruct, Interviews, Press research, Roland Berger

In Switzerland, the prefabricated housing market is projected to remain broadly stable following a slight decline historically

Market volume of prefabricated housing, 2014-2022 [k units]

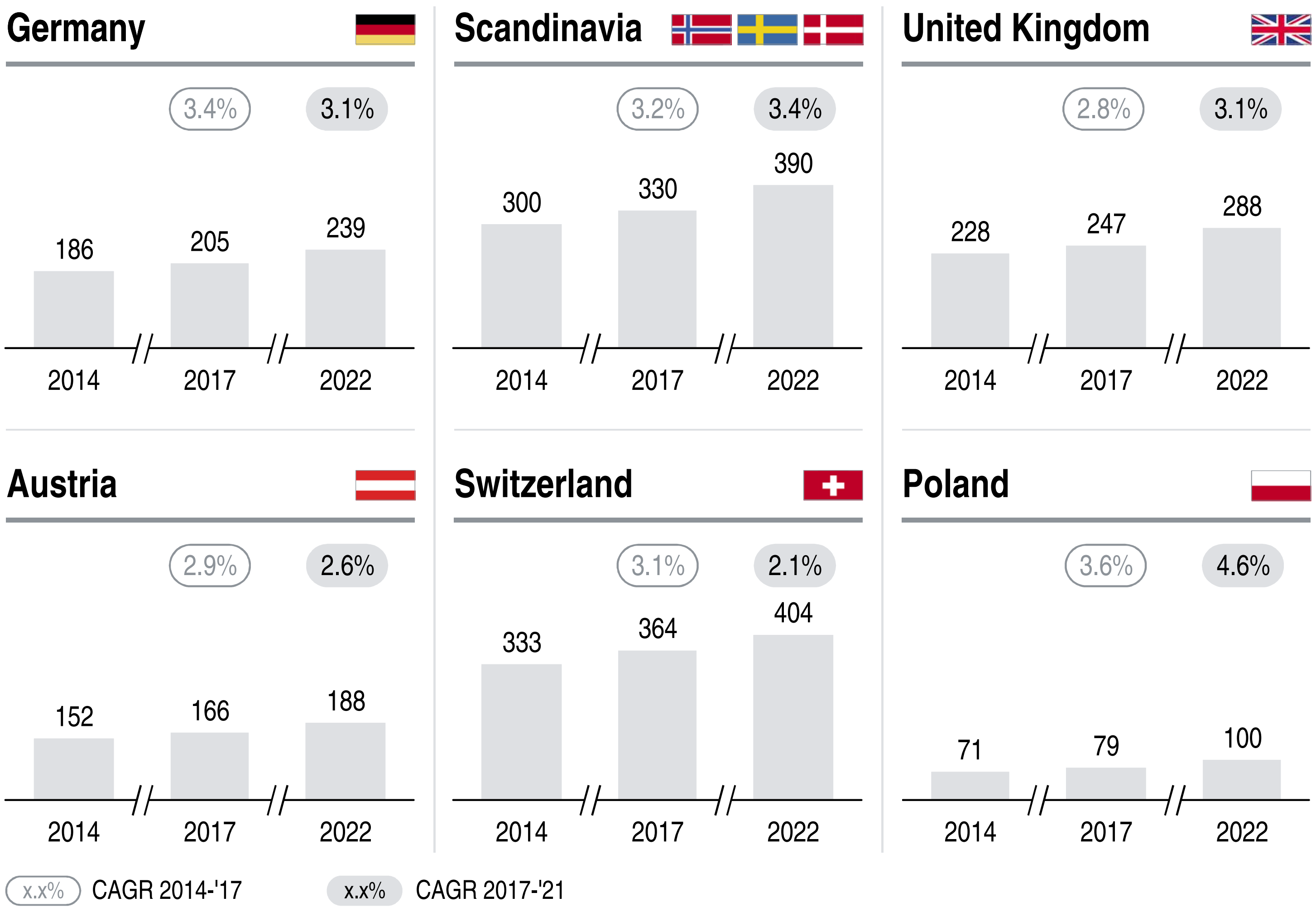


- The Swiss prefabricated housing market is forecast to remain broadly stable following a slight decline between 2014 and 2017
- Turnkey solutions and timber-frame constructions are the prevailing finishing type and material type, respectively
- The premium price segment (EUR >250 k) accounts for the largest share of the prefabricated housing market

Source: Euroconstruct, Interviews, Press research, Roland Berger

Among the focus regions, Switzerland, followed by Scandinavia and the UK, displays the highest average prefabricated housing price

Development of average prefabricated housing pricing, 2014-2022 [EUR k]



- > All focus regions show growing average prefabricated housing prices between 2017 and 2022, largely in line with historical price increases
- > Switzerland, followed by Scandinavia and the UK have the highest average prefabricated housing price – Poland is estimated to have the lowest price
- > Prices are positively impacted by increasing wage levels and a shift towards turnkey solutions, which are more expensive (higher value added)

Source: Euroconstruct, Interviews, Press research, Roland Berger

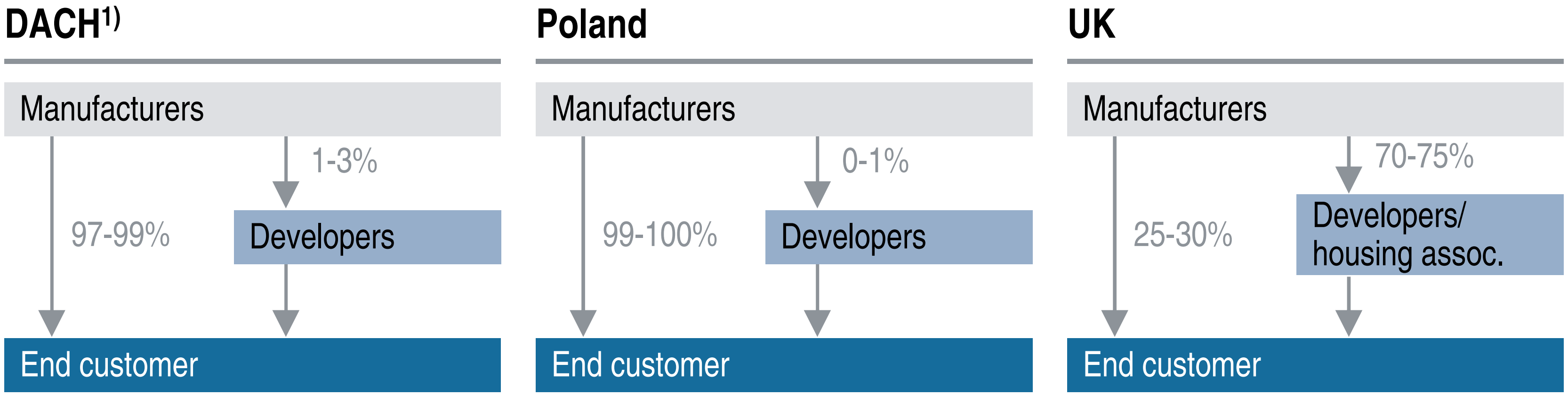
D. Selected customer and manufacturer aspects

In the DACH region, prefabricated houses are typically sold directly to end customers, while the UK has a higher share of intermediaries

Distribution channels – Prefabricated house route-to-market

Indicative

Route-to-market



	DACH[1]	Poland	UK
Relevance of developers and other intermediaries	➔ > Large developers almost exclusively focus on traditional technologies to retain control of the construction process and to optimize costs > Small prefabricated housing manufacturers are reported to cooperate with regional developers on projects of up to 10 houses – However, this is rarely the case for large manufactures	➔ > Housing manufacturers typically organize and supervise house construction on their own > Developers are cost conscious and rely on traditional technologies to fully control the construction process > Developers typically do not consider prefabricated houses for their projects, fearing difficulty in finding multiple buyers for houses based on the rather new technology	➔ > Rather low share of self-build is a result of the lack of land with building permission, difficulties in obtaining a mortgage for self-builders and historical customer preferences towards developer projects > However, the importance of developers is likely to slightly decrease as the government plans to grant more incentives and permissions to individual investors

➔ Future trend

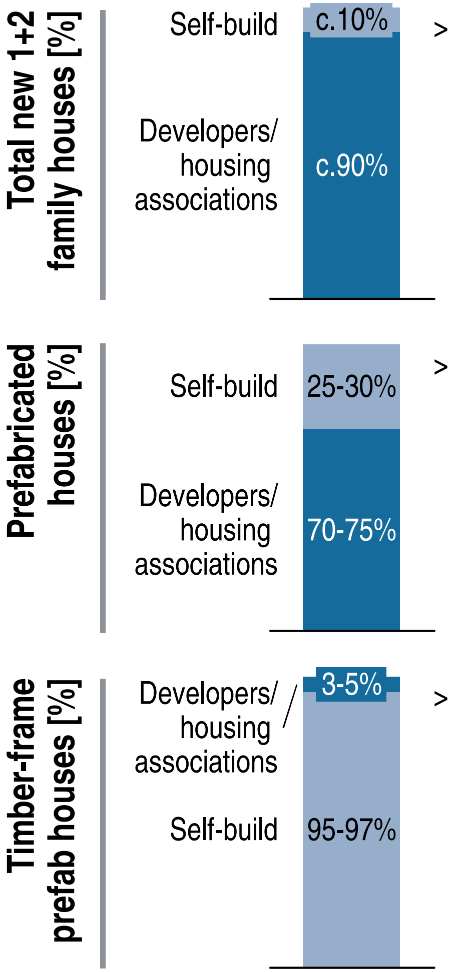
[1] Germany, Austria and Switzerland

Source: Interviews, Roland Berger

The UK prefab housing market is currently dominated by developers – Development of self-build is likely to be supported by legislation

Distribution channels – Deep dive on UK

Indicative



- The residential 1+2 family housing market is dominated by intermediaries
  - Developers and housing associations are better positioned to acquire land, receive construction permissions and financing than individual investors
  - Customers are used to buying ready-made houses built by developers
- Also in the prefabricated housing market, the majority of volumes are estimated to be sold through developers and housing associations
- Self-builders tend to use timber-frame prefabrications (frequently in the form of so-called kit houses for self-assembly), while developers typically focus on other prefabrication technologies

Right to Build legislation

- The majority of local authorities (mainly local councils) across the UK are obliged to hold registers to track the demand for self-build land plots
- Eligible for registration are British or EU citizens >18 years old seeking to build a house as their sole residence
- Local authorities have a duty to grant planning permissions for sufficient serviced plots to meet registered demand within a three-year period (on an ongoing basis)
- Serviced plot is a piece of land that already has access to utilities and is fundamentally ready to develop

- **Legislation is expected to boost the number of self-build homes across the UK**

Selected projects

Cherwell District Council
Delivery of 2,000 custom-build homes in a 10 year period

Sheffield City Council
Making available over 800 self-build sites

Stoke-on-Trent City
Making available 72 hectares of land for self-builders

Teignbridge District Council
'5% self-build' policy (5% of all new homes delivered by self-builders)

...

- **First projects aimed at providing building schemes or sites for self-builders are already in the development phase**

Source: Interviews, Roland Berger

Customers consider quality of sales, product customization, brand image and price/quality ratio as key buying criteria

Customers' key buying criteria

Indicative

Success factors	**Importance**	
Quality	●	> Product quality is one of the most important buying criteria for customers, considering the high investment and the anticipated long period of usage
Quality of sales (online and offline channel)	●	> A customer-friendly sales organization is a crucial factor for typically busy and inexperienced customers > The online channel has become an increasingly important source of product information, comparison and initial shortlisting – Relevance of the online presence as direct sales channel is expected to further increase
Price	●	> Besides product quality, the final product price is a key buying criterion for customers – However, customers are willing to pay for superior quality (good price/quality ratio) > German, British and Swiss customers appear to be considerably less price sensitive than Polish customers
Product customization	●	> Customization options bring the prefabricated segment closer to the solid housing segment > Most of the suppliers allow the usage of external sources in the designing process
Brand perception/ track record	◕	> As the investment is a substantial part of the family budget, a good reputation plays a crucial role in assuring a sound service, particularly for countries with a share of premium-focused customers (e.g. the UK, DE, CH)
Turnkey solutions	◕	> Declining consumer expertise and time limitations drive turnkey solutions, esp. in the UK and Scandinavia > Turnkey solutions offer very high commercial security since the responsibility is borne by the supplier only
Information transparency	◑	> Transparency allows customers to gather preliminary information, make first decisions and compare available options (i.e. house types/variants and manufacturers)
Product portfolio depth	◑	> Typical portfolios cover all types of houses in many variants, therefore portfolio depth is rarely a differentiator > Customers may choose external design offerings if they strive for more personalized solutions
Construction/lead time	◑	> Prefabrication reduces construction time, which is esp. valued by Polish customers – However, this factor is of diminishing importance due to long backlogs resulting in lead times similar to those of regular solid houses
Energy efficiency	◔	> High energy efficiency is standard in the industry and individual manufacturers appear to differ moderately – Initial high investment cost frequently outweighs continuous cost considerations

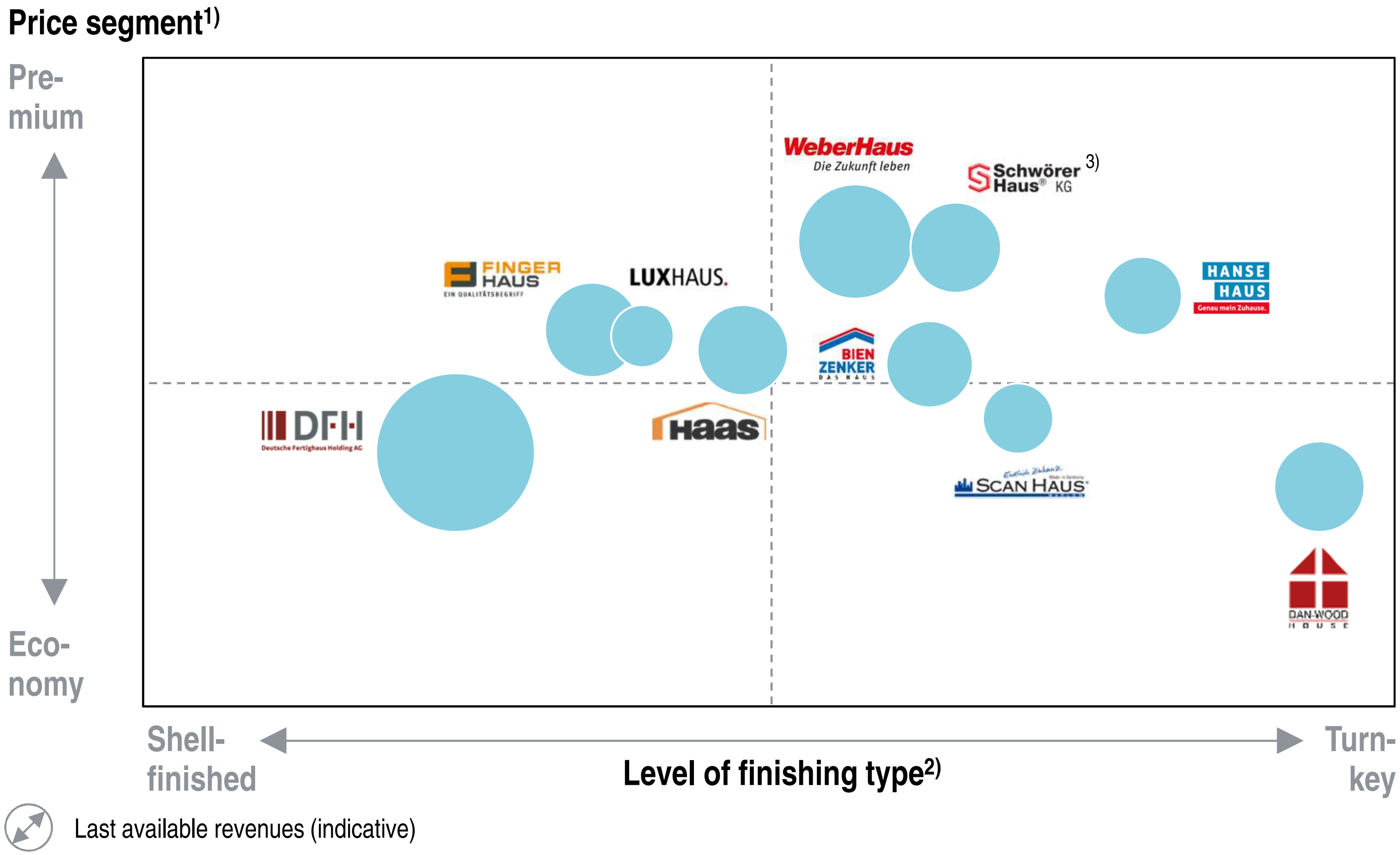
● High ○ Low

Source: Press research, Online communities, Interviews, Roland Berger

Prefabricated housing manufacturers show vast differences in product price segment and level of finishing type

Positioning of selected manufacturers in the DACH region

Indicative



- > The analyzed prefabricated housing manufacturers differ with regard to their market focus
  - – The majority of manufacturers mainly focus on the floor-covering market segment – However, selected suppliers specialize in shell-finished or turnkey house offerings
  - – Prices are estimated to differ significantly between premium- and economy-focused manufacturers
- > There are dominant brands in the economy and premium segments, DFH (esp. Massahaus) and Schworer, respectively – In the mid-price segment, fast growing Danwood is considered to have become a market leader in 2017

1) Estimated average price of prefabricated houses delivered based on market interviews and desk research; 2) Key business focus based on market interviews and desk research;
3) Estimated revenues as no financial information publically available

Source: Orbis, Annual reports, Company websites, Trade press, Interviews, Roland Berger

There are several manufacturers of prefabricated housing in the DACH region – DFH is the largest manufacturer in DACH

Overview of selected manufacturers in the DACH region

Non-exhaustive

	Company	Headquarters		Revenue, 2016[1] [EUR m]	Finishing type			Geographical coverage					Comments
					Shell-finished	Floor-covering	Turnkey	DACH	Scandinavia	UK	Poland	Other	
	DFH	Simmern	🇩🇪	447	■	■	▨	✓	-	-	-	(✓)	Conglomerate of four brands
EQUISTONE	Bien-Zenker	Schlüchtern	🇩🇪	144	■	■	■	✓	-	-	-	(✓)	Acquired by Equistone in December 2017 from ADCURAM
	Hanse Haus	Oberleichtersbach	🇩🇪	116	■	■	■	✓	-	✓	-	✓	
	WeberHaus	Rheinau	🇩🇪	240	▨	■	■	✓	-	✓	-	✓	Founded in 1960 with 2 production sites in DE
	FingerHaus	Frankenberg	🇩🇪	158[2]	■	■	■	✓	-	-	-	-	Best prefab supplier award winner in 2017
	Danwood	Bielsk Podlaski	🇵🇱	154	□	▨	■	✓	(✓)	✓	✓	-	Acquired by Enterprise Investors in 2014
	Haas Fertigbau	Falkenberg	🇩🇪	152[2][4]	■	■	■	✓	-	-	✓	✓	Other markets include CZ, SK and IT[3]
	Schwörer-Haus	Hohenstein	🇩🇪	n/a	▨	■	■	✓	✓	✓	✓	✓	Part of family-owned Schwörer Group
	ScanHaus	Marlow	🇩🇪	91	▨	■	■	✓	-	-	-	-	Operates more than 60 show houses
	Luxhaus	Georgensgmünd	🇩🇪	72[2]	■	■	■	✓	-	-	-	-	Offering of plot and financing concepts

■ Strong focus ▨ Focus □ No to limited focus ✓ Covered (✓) Partially covered

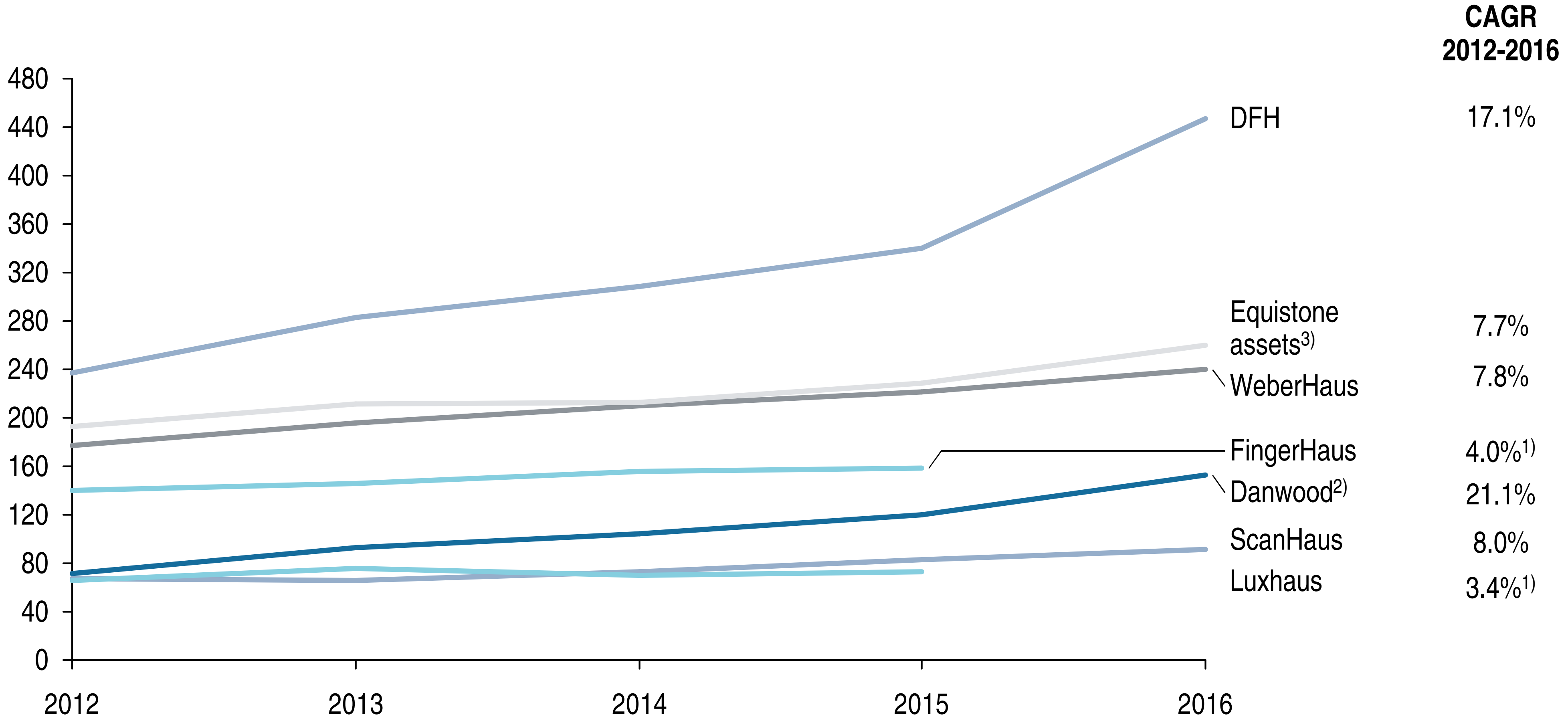
1) Group figures; 2) 2015 figure; 3) Czech Republic, Slovakia and Italy
4) Haas Baumanagement GmbH revenue (part of Haas Group)

Source: Orbis, Annual reports, Company websites, Trade press, Interviews, Roland Berger

The majority of manufacturers have been able to gradually increase their revenues between 2012 and 2016

Revenue development of selected manufacturers, 2012-2016 [EUR m]

Non-exhaustive



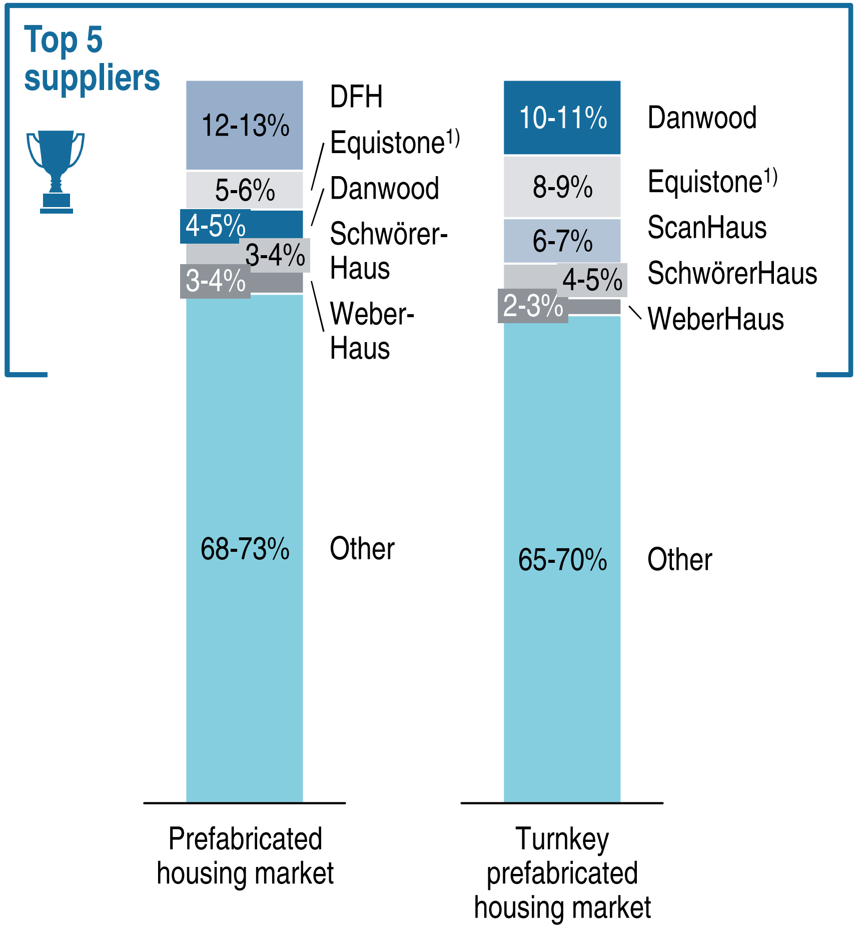
1) CAGR 2012-2015; 2) Figures in PLN have been recalculated to EUR using the fixed exchange rate of 4.4 PLN/EUR;
3) Combined figures of Bien-Zenker and Hanse Haus (also for 2013 prior to the acquisition by ADCURAM) – Acquired by Equistone in 2017

Source: Company information, Dafne, Annual reports, Roland Berger

The German market is largely fragmented with the top 5 suppliers accounting for c.30% – Recent trend towards consolidation revealed

High-level overview of market volume shares in Germany, 2016

Indicative



1) Combined figures of Bien-Zenker and Hanse Haus

Overview of recent M&A activity (selection)

December 2017
Equistone acquired Bien-Zenker and Hanse Haus from ADCURAM

July 2016
Gampen Fertighaus acquired ELK Fertighaus

July 2015
Private equity firm EQT acquired HusCompagniet

June 2015
Matthias Calice acquired Hanlo-Fertighaus

November 2014
ADCURAM acquired Hanse Haus

November 2013
Enterprise Investors acquired Budimex Danwood

September 2013
ADCURAM Fertigbautechnik acquired Bien-Zenker

January 2013
DFH acquired Ein SteinHaus

- Though the German market is more concentrated than other European markets, the top 5 suppliers only account for c.30% of the prefabricated housing market volume
  - Suppliers beyond the top 5 hold market shares of less than 3%
  - Also, the turnkey sub-segment reveals a similar high level of market concentration
- This market characteristic creates possibilities for M&A activity, which has intensified in recent years

Source: Company information, Dafne, Annual reports, Interviews, Roland Berger

Market entry barriers are particularly based on technical capabilities, sales network and brand/track record

Market entry barriers

Indicative

Entry barrier	Description	Relevance
Technical capabilities	> Suppliers of prefabricated houses have to cover a broad spectrum of capabilities, e.g. architecture and housing design trends, construction and engineering (pre-production and on-site assembly), project planning and execution, in order to match customers' high quality demand and price expectations (especially in Germany) – Offering turnkey solutions requires additional building trades with specialized skill sets and certification, e.g. for heating, electric installations, floor-covering, interior construction and sanitary > Considering the dynamic construction market and the respective shortage of workers, new entries are likely to face difficulties finding well-qualified staff at reasonable costs – Long-term employer branding, internal training and incentivization appear to be key success factors	◕
Sales network/ channel	> The establishment of a comprehensive and attractive online channel is required, providing detailed building specifications, pictures, videos, configuration tools and showcases > In addition, the majority of customers demand a local sales agent supporting with the customization of the final product and acting as a central contact person throughout the project – Setting up an exhaustive and skilled sales network is expensive and time consuming due to strong market competition and lack of experienced sales agents	◕
Brand and track record	> Due to high investment costs, customers typically demand a certain track record of successfully delivered housing projects in their relevant region and a positive brand perception in the market (e.g. through former customers or discussion boards) > Suppliers new to the market have to first develop and demonstrate their quality and reliability, thereby continuously building up a positive market perception/track record	◕
Capital intensity	> Considerable investment costs in sales network (incl. housing exhibitions), certifications, as well as to a lesser extent production plant, require the build-up of sufficient sales volumes	◑

● High relevance ○ Limited to no relevance

Source: Interviews, Roland Berger

E. Roland Berger

We regularly extend our project experience with the publication of relevant studies and research

Selected Roland Berger publications

BIM (2017)

Roland Berger
Focus

Turning point for the construction industry
The disruptive impact of Building Information Modeling (BIM)

Digitization in the construction materials industry (2016)

THINK
ACT
BEYOND MAINSTREAM

Digitalisierung der
Bauwirtschaft

Trend study on the construction market 2020 (2016)

Bauwirtschaft im Wandel – Trends und Potentiale bis 2020

Eine Trendstudie in Zusammenarbeit der UniCredit und Roland Berger

HypoVereinsbank

München, April 2016

Investment development in the transport industry in Germany (2013)

Marktstudie Verkehrsinfrastruktur – Kernergebnisse

Rückblick und künftige Entwicklung der Investitionen in die Verkehrsinfrastruktur in Deutschland

München, September 2013

Roland Berger
Strategy Consultants

Impact of the online market on the domestic technology sector (2013)

ROLAND BERGER STUDY
The impact of the growing online market on the sanitary, heating & plumbing industry

Munich/Amsterdam, September 2013

Roland Berger
Strategy Consultants

Construction materials and supply industries in Germany/Switzerland (2012)

Baustoff-/Bauzulieferstudie 2012

Kernergebnisse Deutschland/Schweiz

Roland Berger
Strategy Consultants

München, Mai 2012

Source: Roland Berger

Your contacts at Roland Berger

DR. KAI-STEFAN SCHOBER

Senior Partner

Phone: +49 89 9230-8372
E-mail: kai-stefan.schober@rolandberger.com

Konrad Gruda

Executive Advisor

Phone: +48 601 364 303
E-mail: konrad.gruda@org.rolandberger.com

Justus Jandt

Project Manager

Phone: +49 211 4389-2208
E-mail: justus.jandt@rolandberger.com

Piotr Malik

Project Manager

Phone: +48 698 189-802
E-mail: piotr.malik@org.rolandberger.com

Marco Bühren

Consultant

Phone: +49 89 9230-8790
E-mail: marco.buehren@rolandberger.com

Appendix

Index of abbreviations

Overview

Abbreviation	Meaning
add.	Additional
admin.	Administration
assoc.	Associations
AT	Austria
BIM	Building Information Modeling
bn	Billion
c.	Circa
CAGR	Compound Annual Growth Rate
CH	Switzerland
CZ	Czech Republic
DACH	Germany, Austria and Switzerland
DE	Germany
DFH	Deutsche Fertighaus Holding
DK	Denmark
e.g.	Exempli gratia ('for example')
EnEV	Energieeinsparverordnung (German Energy Saving Ordinance)
esp.	Especially
EU	European Union

Abbreviation	Meaning
EUR	Euro
GDP	Gross Domestic Product
h	Hour
i.e.	Id est ('that is')
incl.	Including
IT	Italy
k	Thousand
m	Million
M&A	Mergers and Acquisitions
n/a	Not applicable
p.a.	Per annum
PL	Poland
PLN	Polish zloty
Prefab	Prefabrication
SK	Slovakia
TEK	Norwegian building regulations
UK	United Kingdom
vs.	Versus ('against')

Source: Roland Berger

Glossary

Overview

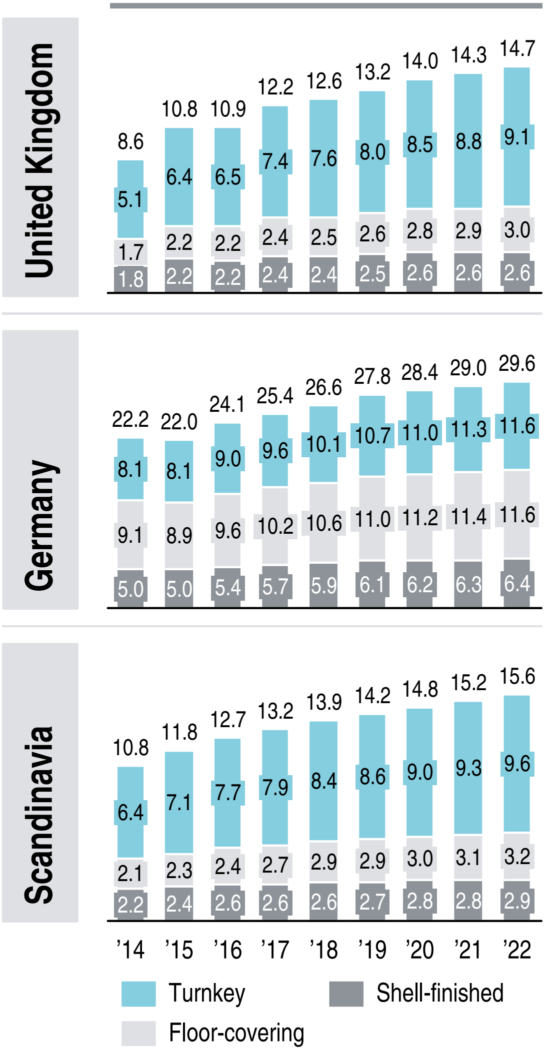
Expression	Meaning
Prefabricated house	Industrially prefabricated houses are manufactured offsite, transported to the construction site and only assembled on-site
Finishing types	
Shell-finished	Shell-finished is a prefabricated housing finishing standard that typically includes the shell construction with plaster and key exterior elements (e.g. windows, exterior doors, roofing and chimney)
Floor-covering	As shell-finished and in addition: heating and electrical wiring
Turnkey	As floor-covering and in addition: Key interior elements, including, among other things, floor coverings, wall coverings, interior door panels and sanitary facilities
Material types	
Solid house	Solid houses are typically constructed on-site with traditional building technologies using different types of materials (i.e. brick, concrete and wood)
Timber-frame house	Timber-frame houses are typically constructed with structures/elements that are built with a wooden frame

Source: Roland Berger

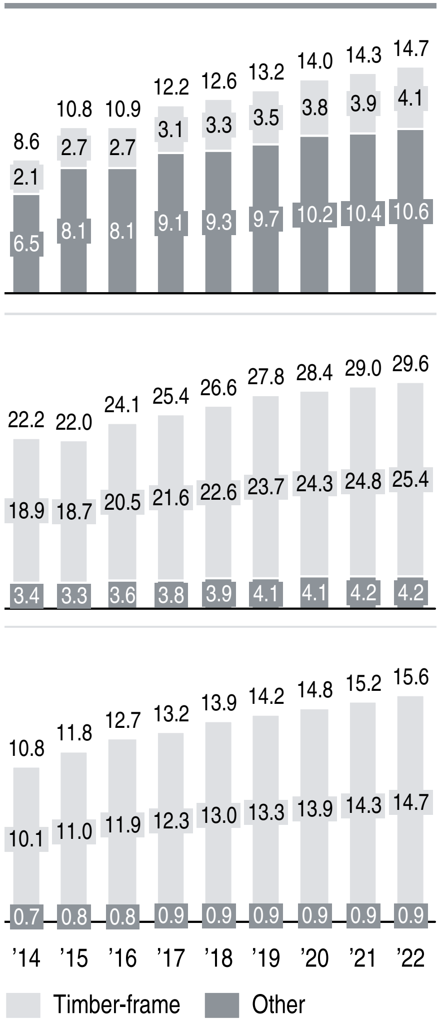
Prefabricated volume and price development by focus region (1/2)

Prefabricated market volume development, '14-'22 [k units]

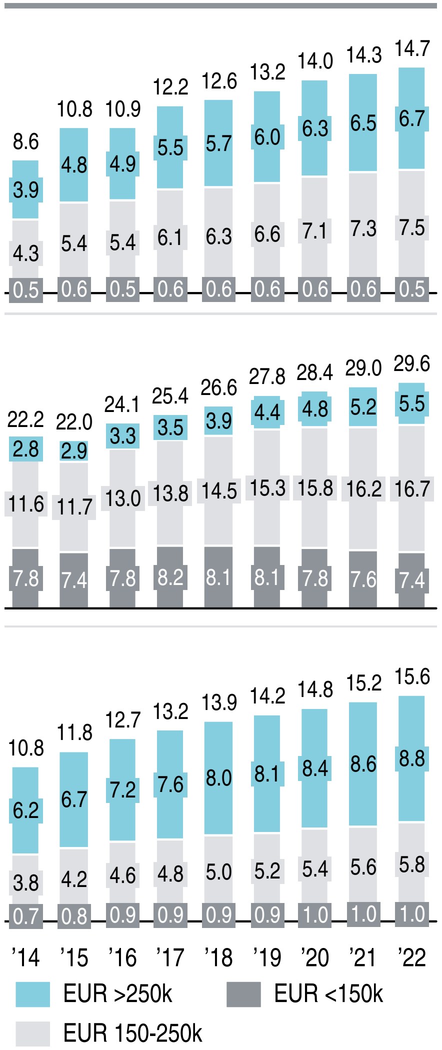
By finishing type



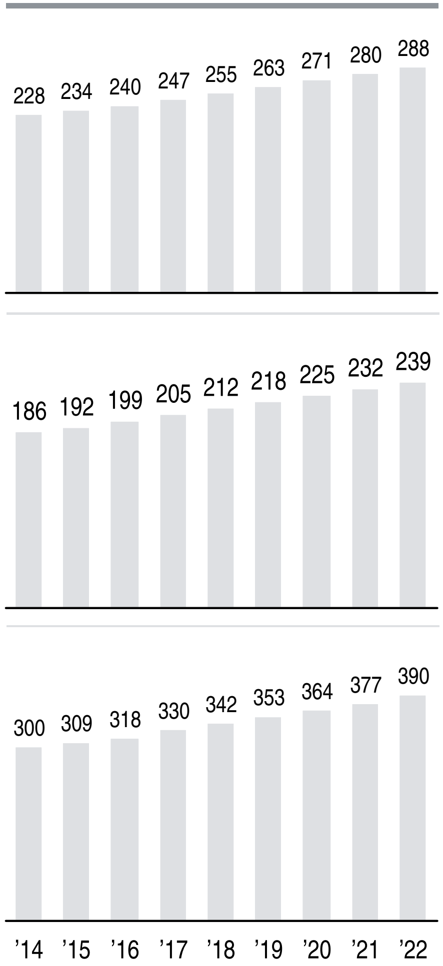
By material type



By price segment

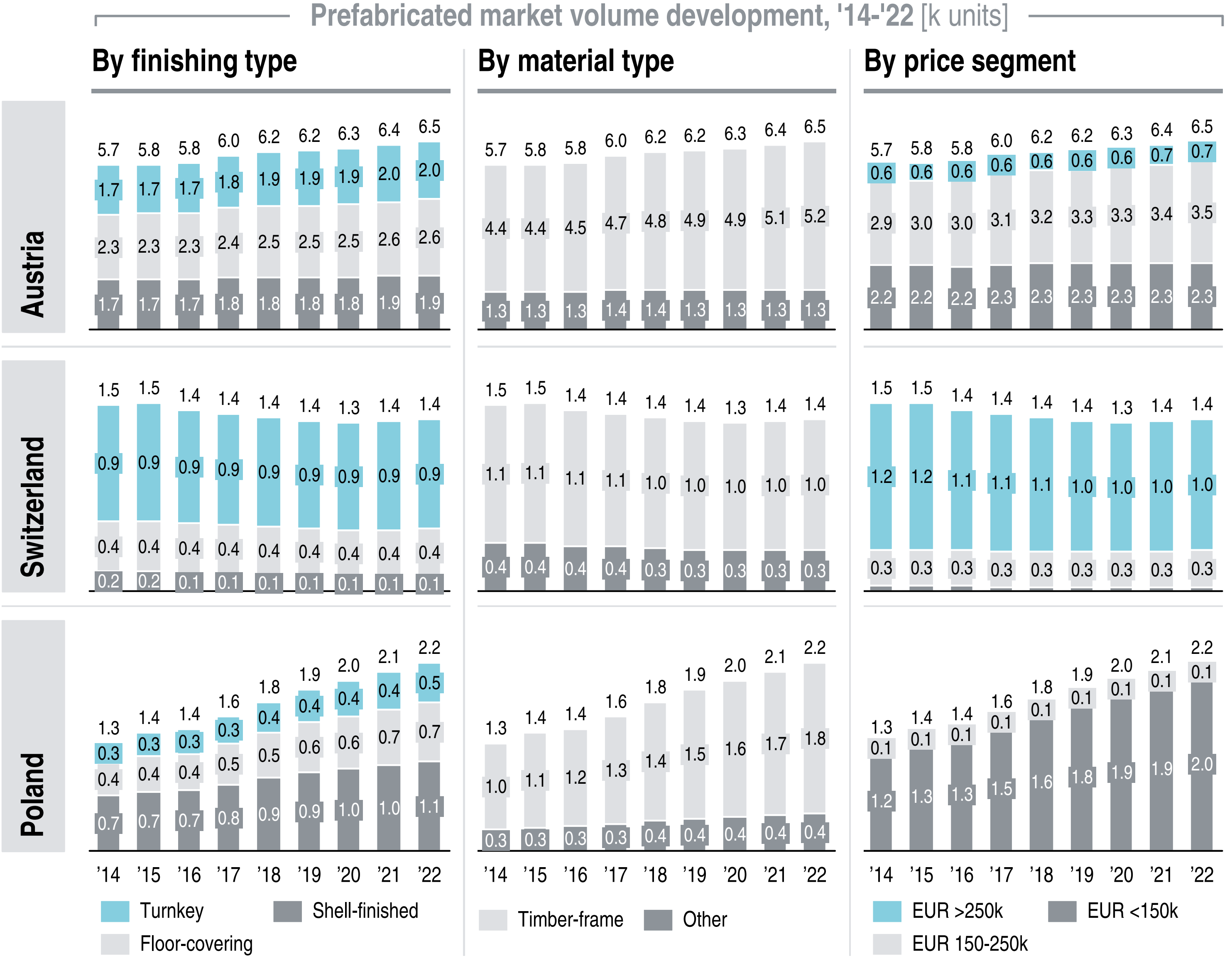


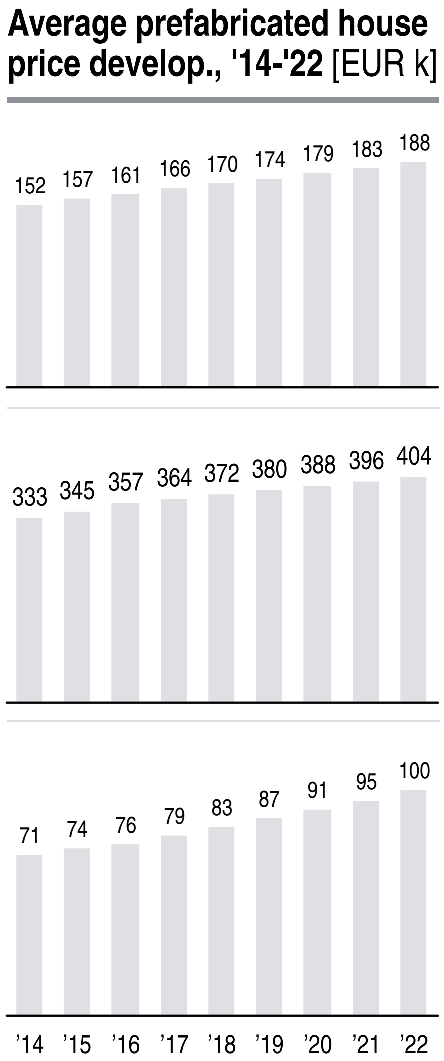
Average prefabricated house price develop., '14-'22 [EUR k]



Source: Euroconstruct, Interviews, Press research, Roland Berger

Prefabricated volume and price development by focus region (2/2)


Prefabricated market volume development, '14-'22 [k units]


Average prefabricated house price develop., '14-'22 [EUR k]

Source: Euroconstruct, Interviews, Press research, Roland Berger

Disclaimer

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