

BACHELOR THESIS CIVIL ENGINEERING UNIVERSITY OF TWENTE
IN CO-OPERATION WITH SINTEF NORWAY

QUALITY IN HOUSING

AN EXPLORATIVE RESEARCH TO THE WAY NORWAY, THE NETHERLANDS AND THE UNITED
KINGDOM MEASURE AND DEFINE QUALITY IN HOUSING AND A DESCRIPTION OF HOW THEY TRY
TO IMPROVE HOUSING QUALITY BY THE USE OF NEW PROCUREMENT ROUTES.

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PREFACE

It started with the wish to perform my bachelor thesis in Norway. Via Geert Dewulf I got in contact with Siri Blakstad, research director at SINTEF Bygg og Arkitektur (which in the mean time changed to SINTEF Bygninger). Siri had several options for me and I choose to start a project related to the Valuta for Pengene project which is about the organization model and value for money in house building.

The first attempt to develop research questions ended up in an impossible concept which could not even be execute within a few years. After focusing under supervision of Geert and Siri I developed the research questions which are the foundation of this report. The task is still rather large but with a pragmatic and descriptive approach I tried to do what I had in mind when I started with this project. I had two important goals, the first was to do something which at least would be interesting for SINTEF to read about and the second goal was not to try the impossible (which I might have failed in a little).

I have learned a lot during the research process, I have read many interesting articles of which only one third ended up to be used in the report but who all together broadened my knowledge about the housing and construction industry. The practical experience of actually doing research has showed me what the difficult parts are and this experience will be of great help when I will start my master thesis.

I want to thank Siri for all the time she took to reflect on my work, Kirsten for the nice meeting we had and the valuable comments on my work. Randi, Arne and Solvår for helping me with the Norwegian quality measuring tools and Wibeke for answering all the questions I had during the process and helping me with understanding the means of the Valuta for Pengene project. I would also like to thank Geert for bringing me in contact with Siri and commenting on my work and Ellen for the support with all the organizational aspects.

With kind regards,

Marieke Plegt

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SUMMARY

When analyzing the approach of Norway, the Netherlands and the United Kingdom to quality in housing the first differences are being noticed in the characteristics of the country and the way the governments are organized. This comes forward in chapter 3.

When looking at the housing policies we see that quality is an aspect in each country but it is not visible from the policies what is exactly meant with the word quality. The centralized structure in the UK and the high level of involvement of the government in the housing industry are also recognizable from the developed tools. The UK is the only country where in case of social housing the fulfillment of all the criteria of a quality tool are mandatory to get funding from the Housing Corporation.

Chapter 4 describes the tools and the organizations which developed these tools. In the Netherlands the industry is more involved in the quality measuring process and tools are used as indicators to show users and contractors the level of quality of a house builder. In Norway and the UK policies from the government are used to develop criteria for the measuring tools. Examples are the Building for Life and the Quality Check List in Norway. The first tool is built directly on housing policies from the government. The second one relates to quality criteria set by the Norwegian State housing Bank which is working closely together with the government.

The stakeholders who determine the quality and the phase in which this is happening are analyzed in chapter 5. The (design) quality is set in the program and the design phase of the building process. Literature review shows that owners have a preference to stay involved in the program and design phase as long as possible. Although different organization models are used this is the trend in all three countries.

The new models which are supposed to have a positive influence on quality can be divided in a few different groups and are described in chapter 6. The first group contains models related to partnering during the building process. This can be short or long term relationships between different stakeholders in the building process. Suppliers can also be part of a partnering agreement. The supply chain is important in the second group; here the concept of mass customization is introduced. The building process now also contains the supply side. Suppliers can be part of the design phase to put in extra knowledge and adjust the design to the possibilities of the supply chain. The criteria used in the tendering process are shifting to more value than only price based. Quality is being integrated into the process.

There are several differences between the countries and to learn from each other it should be kept in mind that simply copying tools and models will not do as there are fundamental differences in the characteristics of the countries and the national housing markets.

1 INTRODUCTION

Quality in housing can be approached from different angles. This research will look how quality in housing projects in Norway, the United Kingdom (the UK) and the Netherlands is handled. The quality of housing will not be evaluated but a description will be given of the way quality is defined in the housing policies, how the quality level of housing is measured and who determines the quality in which phase of the building process. After this the use of new procurement routes as an attempt to influence the quality will be described. All this will be done for each country, the different context in which the tools and models are used and developed is important when the approaches of the countries are being compared.

The research is connected to the Valute for Pengene project (see appendix A for a project description) which is one of the running projects at SINTEF Byggforsk at the Building department (Bygninger). The theme in this project is the relation between cost and quality, the so called 'value for money', and the organization model in the construction of housing projects. One aspect of the Valute for Pengene project is the evaluation of the built quality of housing.

The report is not focused on:

- Evaluating Quality
- Construction costs
- Lead time
- Efficiency
- Self built housing

1.1 Goal

The main goal is to provide an international perspective to the Valute for pengene project based on a literature review. The findings from the different countries will be compared to state the main differences and similarities in their approach to quality. The focus will be on the tools and the organization models used in relation to housing quality. The result will be an overview on a general level.

1.2 Questions

The main question is:

How do Norway, the UK and the Netherlands define and measure quality in housing and with which procurement routes do they try to improve quality in housing?

The two research questions address all the aspects which will be part of the overview. The first question starts with the housing policies and the measuring methods of quality in housing. Here also the characteristics of the countries will be sketched.

The second question builds on this by describing who is actually determining the quality and when this is happening. The last part addresses the question what the recent changes are.

1. How do Norway, The Netherlands and the UK define and measure quality in the construction of housing projects?
 - a. What is the government's goal on quality in the construction of housing projects
 - b. How is the quality measured
 - c. Which stakeholders are involved in measuring quality
2. How do they try to improve quality by the use of new organization models and procurement routes?
 - a. Which stakeholder(s) is (are) responsible for determining the quality
 - b. In which phase of the building process is the quality determined
 - c. Are bids evaluated on quality or only on price
 - d. Are there any recent changes in the use of organization models
 - e. Are there any recent changes in the use of procurement routes

1.3 Index report

After this introduction the research strategy will be explained in chapter 2. The results will be described in the four following chapters.

Chapter 3 'Housing & Quality' is related to question 1a and describes elementary differences between the three countries, the goals on quality distracted from the national housing policies and gives the context in which the organization models and tools are being placed.. Chapter 4 describes the organizations that are measuring quality and the tools they have developed to do so (questions 1b,c). The status of the organizations is described an when describing the tools attention is paid to a predefined list of aspects. Chapter 5 addresses determining the quality (questions 2a,b,c). This will be done by analyzing the used procurement routes to find who has influence in determining the quality and when in the building process this happens. Also the used methods of tendering is explored to see if there is a public tendering process and on which criteria contracts are awarded. Chapter 6 'Improving Quality?' is based on the last two research questions and describes new initiatives based on a literature review which are supposed to have a positive effect on the quality of housing projects. In the conclusion the different tools and organization models will be compared, the context in which they are used and developed limits there overall use but still lessons can be learned in between the countries. Finally recommendations will be given for further research and a reflection made on the used research strategy

The appendixes can be found in the separate report 'Quality in Housing; the Appendixes'.

2 RESEARCH STRATEGY

The research is qualitative and the main source for information will be a literature review, both professional and scientific literature are used in combination with information from governments, involved organizations and of course the Valuta for Pengene project. The approach to the literature is pragmatic and the search is limited by time. This approach is used since there is not enough pre knowledge to distinguish upfront which materials should be found and where exactly to look for them. When questions arise experts will be approached to fill in the blanks.

The research has a descriptive character. The outcome will be an overview on a general level based on all the aspects mentioned in the research questions. Based on the information found and the pictures sketched of the countries a discussion will be started about the use of the different models and quality measuring tools in between the countries. The findings will be compared to see what the main differences and similarities are and if there are typical profiles showing. Each research question addresses one aspect of the total overview which is used as a search term in approaching literature and other documentation .

Documents and articles found on websites are evaluated on their value by checking the source, the authors and the reference lists if available before used for the research.

3 HOUSING & QUALITY

This chapter addresses the way in which Norway, the United Kingdom and the Netherlands approach quality in housing. This will be done on a national level by describing the goals the governments have stated in their policies on housing. Policies on local and regional level will not be addressed.

To introduce this subject first the place of the housing sector in the construction industry will be shortly mentioned and then the national housing markets will be described to show some elementary differences between the countries.

3.1 Housing & Construction

Housing is part of the construction industry which can be divided in three sectors (figure 1)

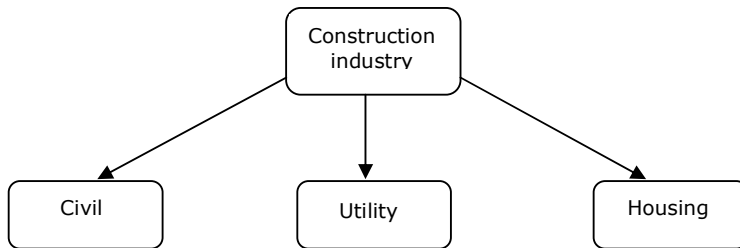


Fig 1 Three sectors in the construction industry

The civil sector focuses on infrastructure and related objects and the utility sector builds offices and other industry buildings.

As shown in the pictures housing is part of the construction industry and from this we can expect similarities between the two. The housing sector differs from the construction industry on a few aspects. The housing industry has different clients, the output is a more consumer focused product and part of it is a social task. The housing industry can also be related to other industries, for example to the manufacturing industry. This will be further addressed in the chapter 'Improving Quality?'

3.2 National differences in housing

To sketch a picture of each country a few aspects concerning the housing market will be addressed. These are the sectors in the housing market and the type of house builders. Together with general information about the country the context is made visible. In a later stadium the tools and used organization models will be described in this context.

The housing market can be divided into three main sectors:

- private rental
- social rental
- private owned

Per country a different distribution between the sectors can be seen. Norway is the country with the biggest private owned sector. 77% of all housing stock is obtained by direct and indirect homeownership (Husbanken, 2006). In the Netherlands the owned stock is approximately 55%¹. Dutch authorities aim at a 65% home ownership in 2010 (VROM, 2000). Norway also has a rental sector but is not familiar with a social rental sector. Social housing is the responsibility of local communities, they provide support for people who are not able to finance their own dwellings (Siri email comments on concept report). In the Netherlands and the UK this social rental sector consists of 75% of the total rental stock which consists of 3 million dwellings² in the Netherlands. In those countries the government takes responsibility for the social housing and this task is distributed to housing associations.

¹ www.vrom.nl

² www.vrom.nl

Besides differences in the deviation of the housing stock between the three sectors there is also a difference in the characteristics of the house builders in the three countries. A difference can be made between public and private organizations.

In Norway almost all the house builders (developers, construction companies and housing associations) are private builders. Only a few are public builders and these are local authorities, an example is the community of Stavanger in the Valuta for Pengene project. In the UK the Registered Social Landlords (further referred to as RSLs) are public builders. The RSLs are both housing associations registered under the Housing Corporation and local authorities, which are together the ones responsible for the biggest part of all social rental housing in the UK (Philips et al, 2004). The housing associations in the Netherlands are private organizations with a public task; besides this non-profit part some of the corporations have developed profit wings which operate outside the social rental sector. (Oostrom, 2001).

The situation in the Netherlands is more similar to the situation in the UK than to the Norwegian situation, this is due to the bigger rental sector. There is a big difference between the involvement of both governments. In the UK the situation is centralized while in the Netherlands the situation is decentralized. In Norway the gross of all housing stock is privately owned which is heavily stimulated by the government, the house builders operate on their own and the situation here is more like the decentralized Dutch situation than the centralized English situation. The government spreads the housing responsibilities to lower authority levels and to the house builders.

3.3 Housing Policies

3.3.1 The United Kingdom

The United Kingdom consists of England, Wales, Scotland & Northern Ireland. For each part separate housing policies are drawn up. The policy described here only addresses England. Housing in England is the responsibility of the Department of Communities and Local Governance (further referred to as DCLG)³.

The government's national policies on aspects of planning in England are set out in Planning Policy Statements (PPS). PPS3 is the policy which addresses housing and has been published in a revised version in November 2006. The policy gives the framework for delivering the government's housing objectives. For the key policy goal see appendix C.

The government wants high quality housing which follows requirements of the users in both the affordable (social rental) and market sector (private rental & homeownership). The subject of high quality housing is described later in the policy in paragraph 12 – 19 (see appendix C). A link is set here between high quality new housing and good design. The UK has to build in large quantity in the coming years (DCLG, 2006).

Attention should be given here to two reports which have been important in initiating changes in the UK house building industry. Both are created after initiation from the government. The reports are Rethinking Construction from Sir John Egan (1998) and the Latham report (1994) (Winch, 2000). More attention to these reports will be given in chapter 6 'Improving quality?'

3.3.2 The Netherlands

The Ministry of Housing, Spatial Planning and the Environment (further referred to as VROM) is responsible for housing in the Netherlands. In their policy on housing 'What people want, where people live' (Mensen, Wensen, Wonen) from November 2000 they give their vision on housing for the 21st century.

The last years the policy has changed from quantity to quality. The quantity problem is not pressing anymore and the fulfillment of requirements from residents has become leading. Expressed is that parts of the Dutch housing stock are no longer up to the current standards.

³ Housing has not always been the responsibility of the DCLG. Originally this was situated under the Department of Environment, Transport and the Regions (DETR), which became the Department of Transport Local Governance and Regions (DTLR) in 2001. In 2002 the DTLR was split up in the Department for Transport, the Department for Constitutional Affairs and the Department of Communities and Local Governance (www.dtlr.gov.uk)

(VROM, 2000) VROM puts the citizen in a central place in its policy, for the policy goals see appendix C.

3.3.3 Norway

In Norway it is the Ministry of Local Government and Regional Development which is responsible for housing. Quality is not directly mentioned in the goals (appendix C). Later in the policy quality is mentioned in relation to adequate housing. Quality is also being related to environment-friendly and universally designed dwellings.

3.4 Conclusion

All together can be concluded that quality is of concern in every country, which is not really a revealing outcome. From the policies is not clearly visible what the differences are between the countries and what the definition of the mentioned quality is. The term is used in combination with words like good and high and quality is being related to design, user requirements and adequate housing.

Generally we can state that in the UK there is a strong link between quantity and quality, large quantity has to be built and the government wants this to be up to a certain quality level. In the Netherlands the wishes of (future) residents are of great importance 'What people want, where people live is' especially focused on the user and his requirements. In Norway quality seems to be closely connected to aspects as universal design and the environment. The centralized nature of the UK is one of the big differences with Norway and the Netherlands.

4 MEASURING QUALITY

This chapter will describe ways in which quality is measured in the three countries. This will be done in two parts; the first part will address involved organizations in the quality measuring process, the second part will describe tools which are being used. The described organizations and tools are the result of a literature review and are not to be seen as the complete picture.

It is important to make a distinction between measuring and for example controlling quality. The different measuring tools are not to be confused with building regulations from the government. The building regulations are the government's way to control a minimum standard and will not be discussed here.

4.1 The Organizations

The organizations mentioned here will be solely the organizations which are involved in measuring quality and in developing the tools described later in paragraph 4.2. Per organization will be addressed what their place is between the government and the industry, what their status is and their role.

In total 10 organizations could be identified from the literature search. These are:

In the United Kingdom

- The Commission for Architecture and the Built Environment (CABE)
- The Housing Corporation (HC)⁴
- The National Housing Federation (NHF)
- The Home Builders Federation (HBF)

In the Netherlands

- SenterNovem
- Aedes
- NEPROM
- Foundation of consumer focused building (Stichting Klantgericht Bouwen SKB)

In Norway

- Norwegian State Housing Bank (NSHB)
- SINTEF / Byggforsk

When we place all organizations in one picture (figure 2) we see that more then half of them originated from the industry and a few are initiated by the government.

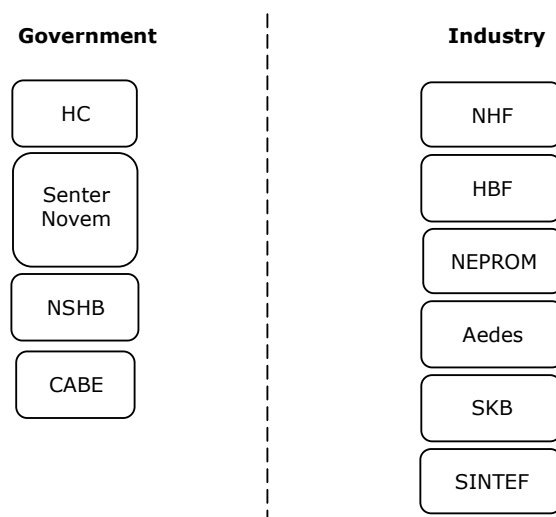


Fig 2 Position of the organizations between the government and the industry

⁴ The tasks of the HC will be merged with tasks from the DCLG and English Partnerships (EP). EP is a national organization helping the governance to support high quality sustainable growth in England. (www.englishpartnerships.co.uk) The new organization called 'Communities England' will take over in 2008. (www.communities.gov.uk)

This does not indicate the status of the organizations and the status of the tools they developed. There are big differences between the status of the HC and for example SenterNovem. The HC has much more power and can influence the housing associations and other parts of the housing industry. SenterNovem is also initiated by the government but can be seen as a more advisory organization. More differences will be addressed below.

4.1.1 The United Kingdom

In the UK the government is highly involved in the housing industry. Organizations as CABE and the HC work together with the government and use their policies on housing and related subjects to develop tools to measure and monitor quality. The government does not only sponsor CABE and the HC but the tools they developed are being used as mandatory criteria for the funding of social housing, see paragraph 4.2.1 and 4.2.2.

The Commission for Architecture and the Built Environment

CABE has an important role in evaluating quality of housing in the UK and is referred to as the 'government's design watchdog' (Baker, 2006), who examines the quality of new housing. CABE is the government's advisor on architecture, urban design and public space CABE was set up in 1999 and it is now a statutory body, funded by the Department for Culture, Media and Sport and the DCLG. CABE believes home builders should focus more on design quality.⁵

The Housing Corporation

The HC funds new affordable housing and regulates almost 2000 housing associations in England together they manage over 2 million homes (HC, 2006). The HC is a non-departmental Public Body which is sponsored by the DCLG.

National Housing Federation⁶

The National Housing Federation (further referred to as NHF) is the industry body representing housing associations in England. NHF represents over 1300 independent, not-for-profit housing associations which provide 2 million affordable homes for 5 million people. The mission of the National Housing Federation is to support and promote the work that housing associations do and campaign for better housing and neighbourhoods.

Home Builders Federation

The Home Builders Federation, also called the House Builders Federation (further referred to as HBF), is the principal trade association representing the interests of private home builders in England and Wales. The 300 HBF members are responsible for more than 80% of new homes built every year.⁷ HBF shares the government's aim that the country should provide a decent home for all in an environmentally, economically and socially sustainable way.

4.1.2 The Netherlands

SenterNovem is the only organization initiated by the government. As said before they are not as powerful as the HC if it comes to regulating quality in housing. The tool they developed is in no way comparable with the HQI in the UK. This will be further addressed by the description of the tools. The tools made by the organizations in the Netherlands are not used as mandatory criteria by the government. NEPROM, Aedes and SKB are all originated from the industry; the status level of these organizations grows with the acceptance of the industry of their standards and tools.

SenterNovem⁸

This is the only organization initiated by the government. SenterNovem is the result of the merging between Senter and Novem two agencies from the Ministry of Economic Affairs. They make the connection between the government and the industry. They bundle knowledge on innovation, energy, climate and the (living) environment. One of the programmes of SenterNovem, called Compass focuses on housing and has developed a quality tool.

⁵ www.cabe.org.uk

⁶ www.housing.org.uk

⁷ www.hbf.co.uk

⁸ <http://www.senternovem.nl/kompas/index.asp>

NEPROM⁹

NEPROM is the Association of Dutch Property Developers. Their members are mostly larger professional property developers responsible for developing 50% of the new build housing in the private sector. NEPROM's goal is to encourage the cooperation between government and property developers in the development of real estate projects.

Aedes

Is the industry body of housing associations in the Netherlands (like the NHF in England). In 2007 the number of members was 492. In total these associations manage 2,5 million dwellings which is about 30% of the total housing stock in the Netherlands. These dwellings are social and private rental houses.

Foundation of consumer focused building

The foundation of consumer focused building (further referred to as SKB) is founded by Building Netherlands (Bouwend Nederland) and the organization of privately owned homes (Vereniging Eigen Huis). They give certificates to developers which prove to build good quality housing and communicate with the public in a good way.

4.1.3 Norway

The Norwegian State Housing Bank works closely with the government but the tools which they support are not mandatory. The situation equals the Netherlands and not the UK. SINTEF is an important player who has been involved in all three tools. They are an independent research institute and work for the industry.

The Norwegian State Housing Bank

'The NSHB is the government's main instrument to achieve adequate housing for all' (Husbanken, 2006). Their main goals are closely related to the ones of the government. The NSHB works with both the private sector and the local authorities to improve housing quality in the general housing market.

SINTEF / Byggforsk

The SINTEF group is Scandinavia's largest independent research company. On January 1, 2006 when the Norwegian Building Research group (Byggforsk) and SINTEF's building and construction research groups joined together SINTEF building and infrastructure was founded. SINTEF Building and Infrastructure is a complete research institute serving the building, construction and housing sectors. (Plegt, 2007)

4.2 The Tools

The tools will all be analyzed by a fixed criteria list (see appendix E). During the literature review ten tools to measure quality were found, also here should be said that this is not the full overview but only a part based on the findings.

In the United Kingdom

- Building for Life (BfL)
- The Housing Quality Indicators (HQI)
- The Design Quality Indicators (DQI)

Currently two of these tools (the HQI and the BfL) are integrated into one system, the fourth version of the HQI.

In the Netherlands

- Netherlands Housing Research (Woon Onderzoek Nederland WoON)
- Monitor New Build Housing (Monitor Nieuwe Woningen MNW)
- Quality scan (Kwaliteitsscan)
- Certificate consumer focused building (Keurmerk klantgericht bouwen KKB)

⁹ www.neprom.nl

In Norway

- The check list developed in the 'Housing quality in a society perspective (Boligkvalitet i et samfunnsperspektiv) project'¹⁰
- The Building Certificate (Byggsertifisering)
- Building Research Series (Byggforskserien)

One of the tools, the Housing Quality Indicators, are used by the government as selection criteria for funding of social housing. Most of the tools are voluntary in use. All tools are described below, the complete tools are, when possible, added in appendix E. The main point of this paragraph is to show what tools are used and what their basic differences are in status, goal and purpose.

4.2.1 Building for Life¹¹

The Building for Life project aims to improve the quality of English housing by:

- Identifying successful new housing schemes and explaining to industry and decision makers why they work so well and how we can learn from them
- Identifying the barriers to delivering quality new housing developments and campaigning to remove them
- Contributing to the wider understanding of the needs and aspirations of homebuyers and encouraging house builders to create housing that satisfies them.

CABE has developed the Building for Life method to assess (design) quality in housing, in cooperation with the House Builders Federation and the Civic Trust. (Gardiner, 2004). They are nowadays supported by the Civic Trust, Design for Homes, English partnerships and the Housing corporation (CABE, 2005)

The 20 Building for life questions are based on the following policy documents. In the brochure 'Delivering great places to life' published by CABE in 2005 the questions are explained and it is shown which policy belongs to which question.

- PPS1 Sustainable development and PPS3 Housing
- PPG15 Planning and the historic environment and PPG17 Planning for open space
- Car parking: what works where, EP 2006
- Code for sustainable homes, DCLG 2006

(CABE, 2005)

The tool is supported by the government and is used by the HC as one of the requirements to receive public funding for social housing. The method can be used for all other new built housing schemes to evaluate the quality; awards are given out to the best schemes. The evaluation of other than social rental schemes is on a voluntary basis.

The questions can be filled out by developers, communities or other stakeholders. To receive a design award a owner has to prove how his scheme performs on each of the 20 aspects. The outcomes are for developers, communities, planners, architects and the public. In general they are for everyone interested in quality. The tool can also be used in making development briefs by developers but also as a way for local authorities to demand certain standards of design.

The outcome is based on the fulfillment of the questions. There are four main themes which in total consist of 20 questions.

- Character
- Roads, Parking & Pedestrianisation
- Design & Construction
- Environment & community

The building for life criteria got integrated to the HQI system in the last review in april 2007.

4.2.2 Housing Quality Indicators

The HQI system is a tool to evaluate existing and potential housing schemes on the basis of quality. The HQI are developed by DEGW after initiative from the HC and the DETR (now DCLG) who had the wish to bring quality into the evaluation system of housing schemes. The HQI is based

¹⁰ This project is a twin project of Valuta for Pengene, the goals of the projects are different but they use a lot of the same data and also share methods like this criteria list

¹¹ www.buildingforlife.org

on the Scheme Development Standards from the HC and Standards & Quality in development from the NHF. Besides this statutory requirements such as the Building Regulations and other mandatory or recommended standards (e.g. SAP, Design of Lifetime Homes, Secured by Design, BREEAM) are used as basis for much of the material in the Indicators.

The tool is institutionalized as it is one of the requirements set by the HC to give funding for new build social housing schemes. It is mandatory for social housing but voluntary to use in other schemes. It can be used for existing and potential schemes, than the analysis will be based on the design of the scheme.

The questionnaire is filled out by an assessor the results are in the case of social housing for the HC to see if the scheme is up to the requested standards to receive funding. In their policy on design & quality standards the required scores can be read (HC, 2007). The outcome is a score for each separate indicator and a total score which shows the strengths and weaknesses of the assessed scheme.

The HQI addresses three themes

- Location
- Design
- External Environment

Together these themes provide 10 Quality Indicators which each are build up of several questions. (see appendix E for the entire questionnaire).

This paragraph is entirely based on the document describing the fourth version of the HQI, published by the HC in april 2007.(HC, 2007)

4.2.3 Design Quality Indicators¹²

Another method is the DQI which focuses on design quality. The DQI has two main objectives:

- Measuring design quality
- Continually improving it

One of its original goals was to develop a tool for benchmarking design quality (Gann et al, 2003)

On of the things the DQI tries to asses is the opinion of the user. As Gann et al (2003) states: *'the most important measure in any evaluation of a building's design quality is whether it satisfies user requirements and what users think and feel about it.'*

The DQI is developed by the CIC steering group and a group of researchers. Sponsoring was provided by DETR, DIT, CABE, Constructing Excellence and the Strategic Forum for Construction. The tool is supported by the Office of Government Commerce¹³ The DQI has been developed as an extension of Rethinking construction. (Gann et al, 2003). The tool is supported by the government and therefor institutionalized. The tool has been launched on October 1st 2003.

'The aim is that by the end of 2007, the DQI will be used on (strategic forum for construction, 2002; construction industry council, 2003):

- 60% of all public funded or Private finance Initiative (PFI) projects (each having a value in excess of £1 million) and
- 20% of all projects (each having a value in excess of £1 million)'

(Whyte & Gann, 2003)

The tool is build after assessing previous quality measuring methods under which also the HQI (Gann et al, 2003). The tool should be answered/filled out by 5-15 different stakeholders. These can be selected from the owner, users, architects, contractors etc. and can be used in every phase of the building process (Gann et al, 2003). The outcome is visualized in a spider diagram and can be used in the briefing, design or management phase of the object. The tool is suitable for all kinds of housing and special versions are developed for example for school buildings.

¹² www.dqi.org.uk

¹³ The Office of Government Commerce (OGC) is an office of HM Treasury, responsible for improving value for money by driving up standards and capability in procurement.' www.ogc.gov.uk

The DQI focuses on three aspects:

- Function
- Build quality
- Impact

These are a modern version of Vitruvius' *firmitas*, *utilitas* and *venustas* (Thomson et al, 2003). The measures used are both tangible and intangible (Gann et al 2003) and are to be answered on a likert scale (Thomson et al, 2003).

Markus (2003) gives a critical review on the DQI.

And Eley (2004) addresses both the DQI and the HQI

'the dqi has been found by many users, as was apparently hoped by those developing the tool, to be particularly helpful in the earliest stages of a building project, to create a managed, and therefore productive way to develop shared ideas and values about what the building should be like when it is designed and built, what qualities people want from it and why'

'the HQI tool was developed in 1996/97 well before the DQI initiative. Despite the similar name they are very different tools. The UK funders of social housing (HC) and one of the ten guardians of the built environment (department of environment) wanted the tool as a means to bring pressure to bear on RSLs to provide a higher standard of design. This new tool was intended to augment the existing SDS that contained statutory requirements for safety, accessibility and so on, as well as other essential qualities sought by the HC. When seeking grant from the housing corporation, RSLs are now expected to submit the relevant HQI ratings for their proposed scheme.'

No information is found about the current use and function of the DQI and the level in which the goal to use the tool for public funded and other projects is being reached.

4.2.4 The Netherlands Housing Research

WoON is the first Dutch tool which will be addressed. WoON is a research method of VROM to assess housing preferences and conditions¹⁴. To give the government an overview of the status of the current housing stock and the quality and expectations the residents have. The method is developed by VROM. And based on two previous research methods, the 'Housing Demand Survey' (WoningBehofte Onderzoek WBO) and the 'Qualitative Housing Registration' (Kwalitatieve WoningRegistratie KWR). It is institutionalized and executed by the government by interviewing persons and households. The outcomes are also for the government to use to underpin their policies on housing. The tool examines all dwellings in the entire housing stock.

The research consists of several modules which will be executed from 2005 until 2010:

- Housing market
- Consumer behavior/affordability
- Safety and Energy
- Housing and Care
- Livability
- Living Surroundings Survey
- Structural survey
- Home Improvements and Maintenance
- Current issues in the years (2005-2010)

(VROM, 2005)

The tool is initialized by the government but has total different purposes than the BfL, HQI and DQI who try to steer the owner builder in the direction of the 'right' built and design quality. WoON is used to support the housing policies VROM develops and gives an overview of the current housing stock.

4.2.5 Monitor New Build Housing¹⁵

The MNW only assess new build sale houses and is developed by NEPROM & VROM, Aedes and Building Netherlands are also involved in the process. The goal is to monitor developments in the

¹⁴ Previously this was done by two other research methods, the 'Housing Demand Survey' (WoningBehofte Onderzoek WBO) and the 'Qualitative Housing Registration' (Kwalitatieve WoningRegistratie KWR).

¹⁵ www.monitornieuwewoningen.nl

development on the sales market for housing. The method is been used since 1997 and in 2003 quality aspects where added.

Aspects that are analyzed are floor space, outside space, the type of dwelling (single family housing, row housing etc), number of rooms and costs. The outcome is a yearly report where the finding supported with graphs are shown.

4.2.6 *Quality Scan*¹⁶

The Quality Scan is developed for housing associations to receive a quality perspective to predefined market segments. It is part of the strategic stock policy and developed by SenterNovem. The status of the tool is low, it can be used solely by housing associations and has a voluntary character.

The tool is meant to asses existing residential buildings to see if the qualities fit certain market segments. The tool works with nine predefined market segments and 14 living/housing qualities (see appendix E). The tool is to be used by housing organizations and should be filled out by persons with different functions within the company. The outcome is for private use.

4.2.7 *Certificate Consumer Focused Building*¹⁷

The KKB is a certificate for housing developers by which a user can see that they are working according a certain quality standard. The certificate evaluates the contractor/builder/developer by evaluating the quality of the delivered products (housing) and the quality of the communication with residents.

The tool is developed by the SKB and is not institutionalized and voluntary. There is a still growing list of builders which have received the certificate or are planning to undergo the evaluation process. The housing evaluate is new build housing that is meant to be sold to residents. The SKB is the one who executes the evaluation process and the outcome is (if all requirements are fulfilled) a certificate which shows the quality of the developer. The status of the tool can grow if users and builders recognize its value.

4.2.8 *The Quality Check List*

This list is used in the Valuta for Pengene to evaluate the quality of the housing scheme, the criteria list is developed in the project 'Housing quality in a society perspective'. The tool is created by Randi Narvestad (researcher at SINTEF Bygg og Arkitektur). The criteria list is for the biggest part based on work the Norwegian State Housing Bank has done to attach definite quality indicators to three themes, universal design, byggeskik¹⁸ and energy & environment.

Other used documentation for the theme Byggeskik og boligkvalitet is Byggeskikkveiledere (Notat hjelp til utvikling av MAL byggeskikkveileder, Byggforsk 2006) and the Boligkvalitetsevalueringsskjema developed at SINTEF Arkitektur og byggteknikk (Støa, Høyland) and the PhD "Attractiveness and density" (Narvestad, 2006). For the theme energy & environment the website www.lavenergi.no, (link from the Norwegian State Housing Bank) and an environmental follow up program to Norwegian projects which are well known in the industry.

The tool is to be used for housing built in the two above mentioned projects to indicate the quality. The tool has to be filled out by a researcher with help of the architects and the contractor where the checkpoints require this all aspects on the list are categorized in 3 categories, Satisfying, Average and unsatisfying. Comments can be ended if necessary. The outcome is a description of the good and bad aspects of the scheme.

The criteria are split up in three main themes

- 'byggeskik'¹⁹ and dwelling quality)
- energy and environment (miljøvennlig boligbygging)
- universal design – internal and external (universell utform – inne og ute)

¹⁶ www.senternovem.nl

¹⁷ www.klantgerichtbouwen.com

¹⁸ See definitions in the appendix report

¹⁹ The definition of byggeskik can be found in the definitions in appendix B

Every theme is divided in a series of aspects. The criteria list does not address aspects related to the location and to the social environment in which the projects are built.

4.2.9 The Building Certificate

The tool is developed to give a quality certificate to single buildings (offices or housing).

Also here SINTEF and Byggforsk (today the same institute) has played a role in developing the tool. Other participants are: Husbanken, Veidekke, Norconsult, , Multiconsult, Nemko Certification, OPAK, Østgaard Arkitekter, Norges Takseringsforbund and RIF.

The tool is based on Norwegian Building Standards and on criteria developed specially for the certificate. The tool has to be filled out by the owner and partially by professionals. The basic information shall be given by the owner/ caretaker, while the condition control will be done by the professionals. The outcome can be or for the owner, to show the condition the building is in and if there is need for maintenance or for a future user to see what the quality of the building is.

The criteria list is extensive and built up of ten themes:

- Basic facts
- Construction interior
- Transport
- Electricity
- Modern information technology
- Climate
- Safety & Security
- Construction safety
- Durability/service life
- Condition (physical building)

Every theme consists of several aspects which need to be checked. This can be on a fulfilled or not basis or on a scale from 0 -3. The tool gives directions to handle the scale and which condition of belongs to which rate.

For more information (in Norwegian) www.byggsertifisering.no

4.2.10 The Building Research Series

This tool can be used by architects and designers of housing. The tool gives indications, solutions and suggestions which encourage good quality in the design, build and management phase of buildings (dwellings).

The tool consists of information on how the construction and the area can be designed and how the design and execution phase can be completed.

The tool is developed by SINTEF Byggforsk and split up in 3 phases

- Planning/layout, this phase includes information about user requirements, building application, land use, interior design etc.
- Details, this phase includes technical solutions, energy use and use of materials
- Management, in the last phase subjects related to management, maintenance and reconstruction

In these phases seven main themes are described:

- forskriftskrav og brukerkav (standards and user requirements)
- utforming av bygninger (design of the building)
- utendørs planlegging (external design)
- konstruksjoner (constructionn)
- installasjoner (installations)
- egenskaper (characteristics/capacity)
- forvaltning (management)

The tool (in Norwegian) is accessible on <http://bks.byggforsk.no/>

4.3 Conclusion

In the UK the involvement of the government is the highest (see figure 3).

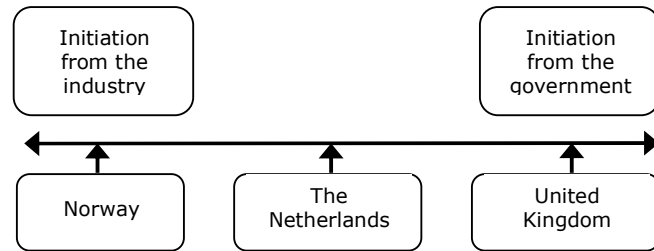


Fig 3 Involvement in measuring quality by the government and the industry

The biggest differences between the tools are their status and their goals. Some tools are aiming at specific stakeholders like the Quality Scan who is to be used by and for housing associations in the Netherlands. Others are meant to give an overview of the existing housing stock (the Netherlands Housing Research) or the goal is to assist an architect in designing good quality (Building research series Norway). The outcome of the building for Life criteria is for everyone interested in the quality of a scheme.

There are three tools which use extensive criteria lists to examine quality. These are the HQI, the Building Certificate and the Check List used in the VfP project. Experts are needed to fill out parts of the lists. All three tools measure the quality of the existing object but the HQI can also be used to evaluate the quality of a potential scheme. The Building Certificate is focused on single houses/buildings while the HQI focuses on entire schemes. The Building Certificate can also be used as an indicator for the maintenance that has to be done on a building.

The DQI and the Building Research Series both are of help to the designer. The way they do this is however totally different. The Building Research Series is a guide to be used by the designer containing standards and examples. The DQI gives the designer feedback by showing the opinions of different stakeholders to the design largely based on subjective criteria. But can also be used in other phases than the design phase. The goal of the DQI is to be used mandatory on public financed projects and other large projects. The status the tools have is significantly different.

If we look at the criteria that are used in the different tools we see that the criteria used in the Norwegian tools are closely related to the goals Husbanken has which are related to the government goals. Important aspects besides the general good design of the object and the residential area are the environment and universal design. Together these aspects describe the overall quality of the built project. In the HQI one of the important tools in the UK we see that the entire surroundings of an object also are analyzed these are even aspects which cannot be influenced by the owner or other stakeholders who develop the project. These criteria are left out in the check list used in the VfP project. This list focuses on the relation between the object and the direct area but do not go further than this.

The only tool that seems to be really interested in the opinions of users is the DQI. Here the user can actually participate in the measuring process, the questions are subjective. Most other tools measure for the user but do not involve the user.

Some tools try to stimulate quality by giving out design awards or certificates which should show the public the quality of their organization or product(s). These are the Building for Life tool, the KKB and the byggsertifisering.

The tools need to be seen in the right perspective which is build up by the developer of the tool and the country and situation the tool is operating in.

5 DETERMINING QUALITY

In previous chapters is shown how the government approaches quality and with what tools quality is being measured. This chapter will look at which stakeholders are determining the quality, when this is happening and how the contracts are tendered. This will be answered analyzing the used procurement route focusing on the organization model and the way the contract is tendered.

The theory behind the organization models mentioned in this chapter is described in appendix D. In the appendix importance is put on four phases in the building process and three stakeholders to give an overview of the main differences in theory.

The chapter is divided in four parts. The first paragraph shows the organization models per country which can be seen as the general used models (the somewhat newer models will be explained in chapter 6). The second part will address when the quality is determined. This will be based on the organization model theory in the appendix on which also the third part will be founded. Here will be defined which stakeholders are active in the phases in which the quality is determined and who has the most influence. The fourth part is about the method of tendering.

I will assume a situation in which the contractor will not influence the quality negative or positively in the construction phase and will work exactly as the design describes. The focus is on the part where the quality is determined not on the influences the later building process has on this quality. When the contractor is involved in the design he will of course have influence on the quality. I will not address controlling and managing contractors here, in the next chapters some examples of this, like the contract with incentives will be mentioned. I will also not look at risk sharing and compensation formats.

5.1 The used organization models

From studying literature several models have been identified as frequently used. This does not mean that for example Develop&Construct is never used in the Netherlands. The table is to indicate the most common models per country.

Organization model	United Kingdom	The Netherlands	Norway
Traditional	X	X	
Building Team		X	
Develop&Construct	X		
Design&Build	X		
Byggherrestyrte enterprise			X
Totalentreprise			X

Fig 4 Frequently used organization models (based on Bens Chop (2007), Goodchild (1999) and the Valuta for Pengene project).

5.2 When is the quality determined

It has already been stated in the appendix that the program and the design phase are the place where the design is made and the quality determined. But when exactly is the quality level set? Usually the outcome of the program phase is a (detailed) brief based on which an architect can start the design process. When the design is finished (to a certain level) it will be transferred to the contractor.

It can be stated that without quality being mentioned in the brief this will not spontaneously evolve in the design phase. When quality is mentioned we will assume it will be taken into account in the design phase too. Therefore the level of quality stated in the brief in the programming phase is the first step to quality. The quality level in the design will be based on the quality requirements in the brief from the program phase. So the goals and requirements in the brief should stimulate the priority of quality in the design and maybe even the construction phase. This last phase will be left out of the analysis like stated in the appendix.

As, in for example the Netherlands, the wishes from the user are important these should also be brought into the building process as soon as possible. This would mean that the owner should include user requirements in his search for the right quality level. The quality in the brief should be reflecting the requirements from the users.

When the owner, who is being put in the role of the quality champion here, is involved in later phases of the building process. For example when he is part of the building team in the design phase the quality will be further developed here.

5.3 Who determines the quality

The important phases are as stated above, the program and the design phase. Based on the organization model different actors are active in these two phases. Already mentioned is that there needs to be a certain reach for quality in the programming phase to get quality in the design phase. Based on the used organization models we can ask two questions: who sets the first steps to quality and who is involved in creating the requested quality level in the design phase?

At first we have to address some issues mentioned in literature which are specific for the housing sector. Goodchild (1999) describes the organization models (procurement routes) used in housing. He states a turn to the Design&Build model to transfer the risk of cost overrun to the contractor but a preference for the use of the Develop&Construct model so the owner has 'as much control as possible' over the design and therefore over the here addressed quality.

This reach for control of the owner can also be read from Benschops paper (2007) which states that there is no request for Design&Build by Dutch housing associations as they prefer the traditional and building team approach in which they have more influence on the design.

In Norway we see the involvement of a stakeholder in the programming and early design phase which has not been mentioned yet in the appendix. As the house builders are almost all private and large parts of their developments are for sale, cooperation with real estate brokers has evolved. The real estate brokers are active partners in some of the VfP projects, they define the markets and even participate in the program and early design of the projects (Kirsten Arge, email 24th of June).

If we now start analyzing the models we see the architect is usually hired in the programme phase. The owner makes a brief before the architect steps in or maybe makes this together with the architect being the advisor. The detail of the brief is dependent on the knowledge of the owner, which he can 'expand' by working with an advisor. In a byggherrestyrte enterprise the owner is usually an experienced builders who can optimally use his influence in the program phase. The design will then be made by an architect who works out the quality requirements into the design. In the traditional model used in England and the Netherlands not all owners are experienced. To make sure the quality level stated in the brief the use of an advisor could be helpful.

In the building team approach the architect the owner and a constructor join forces in the design phase. The knowledge of all actors is bound together to develop the design. The owner can now keep controlling the quality level during the entire design phase instead of just in the program phase after which he gives the control away.

If we look at the Design&Build and the Develop&Construct model the owner is back to making the brief. This can just as in the traditional model be done with help of an advisor/architect who maybe will even be transferred to the Design&Build or Develop&Construct team. In the Develop&Construct approach the owner controls a bigger part of the process and gives the design over to the contractor in a more mature phase than in the Design&Build approach. For both models counts that the supposed favoured effect is the influence of the constructor into the design phase after the contract is handed over. The fragmentation between the design and the construction phase is solved. Here the contractor can introduce his knowledge in the design phase working together with the architect on the final stages of the design.

The theory of the models is not always used in practice. For example in the Norwegian totalentreprise, the design is supposed to be done (at least partially) by the totalentreprenør. In one of the Valuta projects (the project developed by BOB), the transfer is made after the design was fully completed. The totalentreprenør is then used to contract and manage all the

subcontractors and is not involved in the stage where quality is determined which you would expect from theory. (Kirsten Arge, email 24th of June)

Another point of attention here is the possibility for the owner to still have influence after the contract is transferred to the totalentreprenør, this depends on the agreements made between the owner and the totalentreprenør.

5.4 Method of tendering

5.4.1 Public tendering or not?

The use of public tendering is influenced by EU public procurement law. For public authorities this is obligatory if the project exceeds a certain budget level. Public tendering acquires transparency in tendering procedures and real competitive tendering by EU law²⁰.

Important is if the owner organization is public or private. As described in chapter 3 almost all organizations in the Netherlands and Norway are private, an exception has to be made for local communities. In England all the RSLs are public. Private organizations can use a public tendering process but they often work with less transparent and less concrete selection criteria.

5.4.2 Selection criteria

The evaluation of bids is mostly still price orientated, in a public tender process this means that the contract will be given to the bidder who offers the lowest price. Evaluating on value instead of price is supposed to offer more room for innovation in the process which then again is supposed to have a good influence on the value for money and the quality of the project. This will be further describe in chapter 6 'Improving Quality?'.

5.5 Conclusion

From this in combination with the appendix can be seen that in all countries the owner has a strong preference to stay involved in the process of determining the quality. This conclusion can be a little flawed as for example the paper written by Benschop is focuses on housing associations. It does not address the opinion of private builders.

There seems to be a paradox between the owner wanting the best quality and being convinced he can get this by staying involved as much as possible. There seems to be little trust in the capabilities of the architect and the contractor to ensure quality. By this the design and the construction phase stay separate and do not become integrated. Even the models which are meant to integrate these aspects are used in a way that the fragmentation is still there. It seems that the fear for opportunistic behavior is prohibiting good interaction between stakeholders.

²⁰ <http://europa.eu/scadplus/leg/en/lvb/l22001.htm>

6 IMPROVING QUALITY?

In the first chapter is stated that quality is becoming a more important. But can this also be recognized from practice? Is the approach to quality already changed or are we stuck at putting up new initiatives and not implementing them. What is the approach to the improvement of quality? Do initiatives come from the government or from the industry or is there pressure coming from the end of the supply chain; the user?

The improvement of quality addressed here is the expected influence from changes in the organization model or the method of tendering used in the building process. This can be changes in the interaction between stakeholders, new stakeholders who are going to be involved in the design phase or the way the projects are tendered. The goal is to show some developments that are considered to have impact on the quality or are used to try to improve the quality. The overview is based on a literature review.

Other aspects than the procurement method and the organization model influencing the quality will not be addressed. Examples of these aspects are:

- Quality of used building materials
- Private Quality programmes of big builders (f.e. wenswonen Heijmans)
- Building regulations

To explain the approaches some other stakeholders will be introduced which have not been mentioned in the previous chapter. For example the supplier and the user, or at least his requirements, will be of greater importance.

Instead of directly being aimed at improving the quality many new initiatives strive for better project performance or aim at being innovative. Quality is then usually one of the characteristics.

6.1 Initiators

Just as in measuring quality other organizations than the government are involved in putting up new initiatives. Some of the before mentioned organizations in the chapter Measuring Quality are also working on those new initiatives. A short description will be given of organizations which have not been mentioned before.

In the UK the main initiator is

- Constructing Excellence²¹

The Housing Forum is one of the membership forums of Constructing Excellence. Naim and Barlow (2003): 'the house-building industry is undergoing a sustained effort, largely via the Housing Forum, to reduce construction costs and improve delivery times and quality'.

The biggest players in the Netherlands are:

- Regieraad Bouw
- PSiBouw
- Bouwend Nederland

The Regieraad is an initiative from the Ministries of Economic Affairs, Traffic and Civil Works and Housing, Spatial Planning and the Environment. The goal of the Regieraad is to show the construction sector the need for innovation and to start the necessary change in culture. Three important aspects of the necessary change of culture are, innovation, transparency and the Quality/price ratio. The PSiB is closely related to Regieraad, they work together on a lot of initiatives. PSiB stands for Process and System Innovation in the Building Process. Building Netherlands is the industry body of the sector.

In Norway should be mentioned:

- Byggekostnadsprogrammet²² (building cost program)
- Byggherre i fokus²³ (the owner in the spotlight)

²¹ www.constructingexcellence.org.uk

²² www.byggekostnader.no

²³ www.byggherrenifokus.no

Both are programs set up by the industry who work on improving the efficiency of the building process and on other aspects like Value for Money.

On an international level there are:

- the International Group for Lean Construction IGLC²⁴
- the International Council for Research and Innovation in Building and Construction CIB²⁵
- Performance Based Building Network PeBBu²⁶
- The Royal Institution of Chartered Surveyors RICS²⁷

Also improvement following initiatives from other industries is visible in the countries. This can be either from the construction industry or from the manufacturing industry. It is argued by some that the housing industry in fact is really closely related to the manufacturing industry. And as Egan said in the report *'construction industry to deliver its product to its customers in the same way as the best consumer led manufacturing and service industries.'* (Naoum, 2003).

Also in the Living Building Concept developed by De Ridder and described by De Ridder and Vrijhoef (2006). Here the goal is to make the construction industry work like any other consumer industry to improve the performance.

6.2 New Procurement Routes

Ang et al (2005) state: *'procurement processes are seen as fundamental to improve or hamper building performance. Inconsistent requirements and imperfect communications give rise to many of the industry's problems.'* Like poor value for money, cost overruns and time overruns.

However Goodchild (1999) states *'the relation between build quality and procurement is a matter of dispute'*. The initiative that will be discussed in this chapter are aiming at improving the quality. There is no empirical evidence of the connection between the initiatives and the reached quality level in the building process.

Several new initiatives can be recognized. These can be categorized as following and are related to roles and interaction between various stakeholders in the building process. There are two initiatives which seem to be the most popular:

- Interaction between stakeholders
- Supply chain management

Other new initiatives are for example taking a performance based approach and the shift towards value tendering. All initiatives will be shortly mentioned based on a literature review.

6.2.1 Interaction between stakeholders

In the previous chapter the process has been described discussing the roles of the stakeholders. In most models a separation between roles and phases of involvement is easy to recognize (fragmentation).

We will start from the Valuta for pengene project. The byggherrestyrte enterprise and the totalentreprise have been explained in appendix C. Besides these there are some alternative types of the totalentreprise model used in the Valuta for Pengene project. These are the forhandlet totalentreprise which can be used on its own or in combination with an incentive agreement or an 'open bok' procedure. The forhandlet (negotiated) totalentreprise is a relative new model. Here the contract is not awarded to the lowest price but the owner and the totalentreprenør will negotiate on price and quality.

When incentives are used and there is an open bok procedure then we speak of the Samspill model. Here the contractor and the owner remain in close contact during the construction phase. The project is handed over to the contractor but a transparent process (open bok) offers room for discussion in the construction and part of the design phase. (Kirsten Arge).

²⁴ www.iglc.net

²⁵ www.cibworld.nl

²⁶ www.pebbu.nl

²⁷ www.rics.org

There is clearly more interaction between the stakeholders. This initiative can also be recognized in literature and is often referred to as partnering. Partnering can be for example between a contractor and a developer/housing association, or between a contractor and a supplier.

Partnering is (among other things) already suggested in the report Rethinking Construction written by Egan (Fortune, C and Setiawan, S, 2005) and in the Latham report (Naoum, 2003).

The definition of partnering that has been most widely accepted (according to the National Audit Office, 2001) is the one of partnering being a cultural approach to the organization and delivery of construction projects which has been developed by Bennet and Jayes in 1998 (Fortune 2005).

Fortune (2005) divides the organizations using partnering in either supply or demand side focused. From the survey the author conducted was seen that the most significant benefit (in theory) of having established long-term relationships with other organizations is improved quality. From Fortunes article can also be read that long term partnering is being widespread. Fortune states that long term partnering is *'at the core of effecting change in the culture of the UK construction industry to achieve better levels of quality and value for money'*.

Naoum (2003) gives an overview into the concept of partnering and states the reasons for partnering to develop. According to Naoum (2003) partnering evolved from the development of strategic alliances in order to manage the supply chain, and the failure of traditional procurement methods to meet client criteria and to achieve project objectives. The most successful partnering agreements was not only with consultants and contractors but also with suppliers.

Winch (2000) talks about two forms of partnering: single project partnering and multi project partnering. The latter is a long term relationship.

Cox and Thompson (1997) state that *'partnering is not the pancea for all illnesses'* they suggest the use of fit for purpose in the approach to relationships between stakeholders. Relationships should be the means and not the end. They suggest that the construction industry with its project based structure and the opportunistic behavior of stakeholders might not be ready for full partnering.

Besides the already mentioned partnerships there are also Public Private Partnerships (PPP). The Private Finance Initiative (PFI) is one type of PPP which is developed in the UK and used since 1994. The PFI offers public organizations the possibility to operate without public funding but under financing from private investors. Grubnic and Hodges (2003) write about the PFI in social housing.

A characteristic of the PFI is its long term nature. The use of PFI in social housing is to increase the investment in social housing. The article by Grubnic does however not address the use of PFI for new built housing but only for renovations of existing schemes.

In the Netherlands the wishes and requirements of the users are found to be important. At the moment several housing development projects (under the supervision of PSIB) are trying out new initiatives mostly related to freedom of choice for the user. (PSIB, 2007)

6.2.2 The supply chain

The next initiatives are related to the supply chain. As written in the beginning of the chapter there is influence coming from the manufacturing industry. Changes to the supply influence the organization of the building process, the supply chain has to be integrated into the process to optimally use the new initiatives.

Barlow (1999) talks about lean and agile production and gives the following definitions:
Lean production: *'a way to improve quality, minimizing stock and ensuring continuous improvement.'*

Agile production: *'achieve a level of flexibility in production processes which allows 'mass customisation', the production of highly customized products at costs comparable with mass.'*

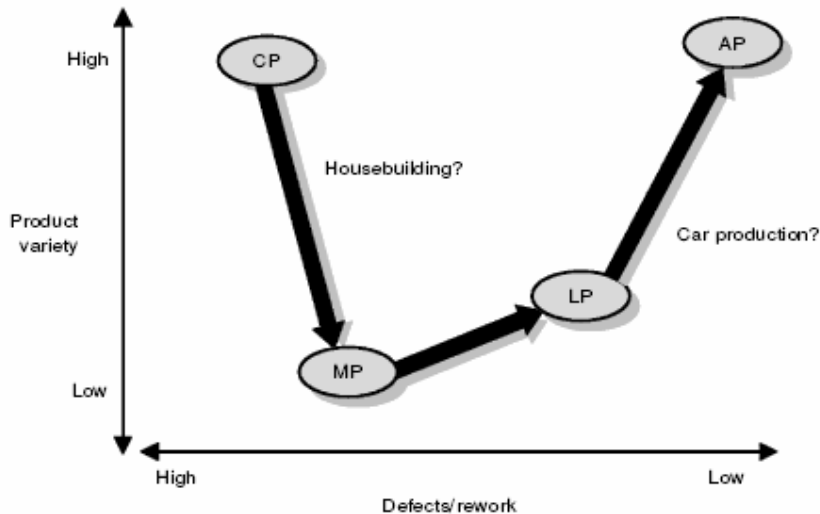


Figure 3. From craft to agile production. *Source:* Derived from Baker (1996).

Fig 5 Craft Production, Mass Production, Lean Production and Agile Production (Barlow, 1999)

Figure 5 is directly distracted from Barlows paper and shows the place of the housing industry related to that of car manufacturing.

Lean and agile common since 1990 in other manufacturing industries. (Naim and Barlow ,2003). According to them: *'Combining lean and agile principles can deliver total value to the customer, without incurring a severe cost penalty.'*

The lean and agile strategies have a certain customer focus. This is also addressed by Barlow and Ozaki (2003). They see the user as a starting point of the design or entire project. *'The project will not (only) focus on profit but also look what the actual requirements from the customer are to offer a product which is as suitable as possible'*. According to the authors it will be necessary for the industry to adopt a broader view of costumer focus, which integrates customers into the product supply chain more closely. So far product customization has barely impacted on UK housebuilding.

Barlow et al (2003) describe the Japanese factory-based housing industry to see how this concept could influence the UK speculative housebuilding industry. Japan has adopted *'build-to-order techniques – standardization, prefabrication and appropriate supply-chain management – to deliver high levels of customization in housing design and specification. In doing this, it has been demonstrated that mass customization can be supported by several generic supply-chain models. These allow specific customer needs and market segments to be more effectively met without the cost associated with full customization..... However, it is unclear if the UK housebuilders will move towards increased customization.'*

We can find the attention for the supply chain back in the article written by Ang et al (2003). One of the goals in the future perspective of the building and construction industry (in the Netherlands) set up by the Ministry of Economic Affairs, the Ministry of Traffic and Civil Works and the Ministry of Housing, Spatial Planning and the Environment is: *'the professionalization of the supply side across the entire supply chain, and improving the quality and the value (or price/quality ratio) provided by construction'*.

6.2.3 From price to value thinking

A shift form price to value thinking is noticeable in the award criteria used for tendering processes.

Disadvantages of bidding on lowest price (Naoum, 2003) *'A lack of value management and innovation in design, in methods of construction, in products, in sub-contractor and supplier procurement, when bidders are restricted to pricing a pre determined solution with specified products.'*

RSLs have moved away from the lowest bid after influence from the government. They have moved to both price and quality as selection criteria in the tendering process. In 2000 both local authorities and the HC adopted the best value regime and the use of partnering in the procurement process. (Philips et al, 2004)

Philips et al (2004): *'Unless an RSL under the umbrella control of the HC can demonstrate that it implements its procurement process in compliance with ethos of collaborative working and value for money objectives, it will not receive grant monies to carry out the required work.'*

Best value definition by the UK government:

'The optimum combination of whole life cost and quality to meet the users requirements. Long term value over the life of the asset is a much more reliable indicator than lowest cost and it is the relationship between long term costs and the benefit achieved by clients that represents value for money.' (office of government commerce 2003)

Best value definition by the HC:

'procurement in the context of property development, regeneration, and maintenance services is the activity by which a housing association obtains its building and properties taking account of price, quality, time and sustainability to deliver overall best value.'

Goodchild 1998 defines Value for money as *'the cost for a given level of quality, (with this latter understood in broad terms to include different dimensions such as build quality (durability), floorspace, comfort, economy in use and appearance.'*

6.2.4 Performance based approach²⁸

Performance based means working in terms of ends rather than means. When a design is made this should not be to construct a house but to construct an object in which a person or family can live, work, sleep, relax etcetera. The design should focus on functional requirements.

(Ang et al 2005): *'PB based procurement and tendering does not solve the problem of requirements that cannot be verified objectively. However, it provides room for innovation and serves to stimulate better performance across the supply chain.'*

And later in his article: *'Procurement is definitely a prime tool for improvement and reform in the building and construction sector, and PB technology can enhance this.'*

6.3 Reluctant to change

Some like to say that the construction industry is not easy to change; the industry is clinging to its traditional ways of working and it seems to be much slower than other types of industries in adapting. Philips et al (2004) add to this that the public sector is not known for its willingness to change. Pries en van Heijgen (2005) disagree with this and show that the industry is changing. The change is happening in an incremental way which makes it less obvious but it is still there.

Barlow (1999) has defined three barriers to innovation in house building.

- The lack of competition
- Previous successful behaviour and a lack of strategy
- A fear of change

From this we can see that there are mixed opinions about the innovation ratio and the speed of change in the construction industry. This might also be a reason why the process of trying to improve quality is going slowly.

6.4 Conclusion

In the UK the government is stimulating research and change through several organizations. This is also done in the Netherlands. In Norway it seems that the government does not actively stimulate quality improvement programs. This is mostly done from the industry itself or by research institutes.

The changes in the interaction between the stakeholders points to a shift from product quality to process quality. The quality is not stated by solely the owner but the participation from other

²⁸ www.pebbu.nl

stakeholders is crucial. By integrating more knowledge from different sectors into the design process the end quality is supposed to be better.

Another important stakeholder who is being noticed more and more is the user. In the Netherlands a few trial projects are running in which the user can participate in the design phase or has the final sayings about the interior of the building.

Another initiative that focuses on the user is the concept of mass customization. The goal here is to provide the user with a certain amount of choice but to do this for a price which is related to more standardized housing. This is already implemented in Japan but in Norway, The UK and the Netherlands the concept is not accepted yet. The subject comes up in several research papers and has potential to be used.

Partnering is supposed to have a positive influence on the quality by positively influencing the value for money. This is stated in one of the hypotheses of the valuate for Pengene project in a presentation from the 14th of February (See appendix A).

7 CONCLUSIONS & RECOMMENDATIONS

This chapter includes the conclusions and recommendations based on the results. After that a reflection on the research strategy is given. The conclusions are based on all the found information and the links made in the report. The characteristics of the countries provide the context in which all findings have to be seen.

7.1 Conclusions

The international perspective shows activity in all the countries around Quality in Housing. Every country mentions aspect in their housing policy and seems to measure the quality with a range of tools. The overview is given in the report but what are the differences and similarities if start comparing the countries based on these findings? Not all the countries take the same approach to quality in housing and have the same priorities. The initiatives in the countries do also show some level of compliance.

7.1.1 Differences

We can state that the UK has highest level of government involvement, both in measuring quality and in the improvement initiatives. The situation in the UK is highly centralized. The Norwegian government seems to be the least involved based on the found literature and documentation. Both the Dutch and Norwegian government work with a decentralized structure. The percentage of homeownership is the highest in Norway and social housing is the responsibility of local communities and is not put with housing associations like in the UK and the Netherlands.

Two measuring tools in the UK are the only ones which can be used to analyze potential schemes (DQI and HQI). The other the tools focus on existing schemes and buildings. The Netherlands stay behind when it comes to integrating the contractor into the design process. This is more common in Norway and the UK. The UK is also more used to working with private investors.

7.1.2 Similarities

Similarities are visible when we look at the involvement of the owner in the program and design phase. From the organization models used we can see that the owner prefers to have a lot of influence in these phases. New initiatives will stimulate more interaction between stakeholders.

The UK and Norway share the acceptance of partnering in house building, as there was no information found about this aspect in the Netherlands there can nothing be sad about this country here. Mass customization and industrialization of the building process are potential quality improvers but none of the countries seems to have implemented this.

7.1.3. Learning from each other

There are several differences and similarities visible but what causes these differences and what are the possibilities for the countries to learn from each other? In the UK the involvement of the government is very high, also in the prescription of the quality level and the appropriate designs. It can be said that the process of developing quality is more hierarchical. The Netherlands and Norway are used to more participation of users or work more from a user perspective. The quality is not 'prescripted' from the government but developed by the owner in the building process.

The Netherlands look often at the UK for new initiatives. The way the construction and housing industry in both countries operates is not similar enough to copy methods. The centralized and decentralized characteristics of the countries prohibit this.

7.2 Recommendations

The countries can learn from each other if they keep in mind that there are differences in there characteristics. Simply copying methods from the others will not be sufficient to create new initiatives who will add value to the housing industry.

7.3 Further research

The report contains a broad overview in which a lot of aspects, initiatives and tools are addressed but not closely analyzed. It would be interesting to analyze for instance the measuring tools more closely and look into the differences and similarities on a more detailed level. Also the use of all organization models can be much further explored. The basic theory is described in the report but it would be interesting to try and make the relation to practice to see why certain initiatives are adopted quicker than others.

It would also be interesting to assess what the countries could learn from the differences and similarities that exist between them. A third point would be to analyze what causes these different approaches.

7.4 Reflection on strategy

The pragmatic approach has been good as it was not possible to estimate up front which information was needed and would be available. This however has also a downside as the longer the search continues the more information will be found. The time limit has made an end to the search phase but I am left with the feeling that there is much more.

With reading every item found the knowledge frame grows and lots of new ideas and approaches come up. The research questions are really wide and the only limit is the descriptive approach and the pragmatic time limited literature review. As the research is wide there is no depth reached in the report. The overview is on a general level as there was no space to describe aspects more detailed.

A lot of the literature found has only been used for a small part even though much of it was really interesting. There is no way to state with certainty that the picture sketched in this report is complete. It should be kept in mind that a lot of literature and documentation has been read but that there are sources not explored and literature not found.

8 REFERENCES

- Ang, G et al (2005). Dutch performance based approach to building regulations and public procurement. *Building Research & Information* 33, pp. 107-119.
- Barlow, J (1999). From Craft Production to Mass Customization. Innovation Requirements for the UK Housebuilding Industry. *Housing Studies* 14, pp. 23-42.
- Barlow, J et al (2003). Choice and Delivery in Housebuilding: Lessons from Japan for UK Housebuilders. *Building Research & Information* 31, pp. 134-145.
- Barlow, J & Ozaki, R (2003). Achieving 'Customer Focus' in Private Housebuilding: Current Practice and Lessons from Other Industries. *Housing Studies* 18, pp. 87-101.
- Benschop, T.P. (2007). *Design Build and Housing*. Final thesis of the study Civil Engineering and Management at the University of Twente, unpublished.
- Byggherren i Fokus (2003). *Metode for valg av anskaffelses- og kontraktstrategi*. <http://www.promsys.no/byggherren/pdf/beskrivelse.pdf> visited May 2007.
- CABE (2005). *Delivering great places to life* (London, CABE).
- Department of Communities and Local Government (2006). *Planning Policy Statement 3 (PPS3) : Housing* (London, Department of Communities and Local Government).
- Eley, J (2004). Design quality in buildings. *Building Research & Information* 32, pp. 255- 260.
- Fortune, C and Setiawan, S (2005). Partnering practice and the delivery of construction projects for Housing Associations in the UK. *Engineering, Construction and Architectural Management* 12, pp. 181.
- Gann, D et al (2003). Design Quality Indicator as a tool for thinking. *Building Research & Information* 31, pp. 318-333.
- Goodchild, B & Chamberlain, O (1999). Building Procurement in Social Housing in Britain: A Review of the Main Issues, *Housing Studies* 14, pp. 861-880.
- Grubnic, S & Hodges, R (2003). Information, Trust and the Private finance Initiative in Social Housing, *Public Money and Management* 23, pp. 177.
- Housing Corporation (2006). *Our stories, Housing Corporation annual report and accounts 2005-06* (London, Housing Corporation).
- Housing Corporation (2007). *HQI, Housing Quality Indicators Version 4* (London, Housing Corporation).
- Housing Corporation (2007). *Design and quality standards* (London, Housing Corporation).
- Markus, T.A (2003). Lessons from the Design Quality Indicator. *Building Research & Information* 31, pp. 399-405.
- Ministry of Local Government and Regional Development (2004). *On housing policy; summary in English* (Oslo, Ministry of Local Government and Regional Development).
- Naoum, S (2003). An overview into the concept of partnering. *International Journal of Project Management* 21, pp. 71-76.
- Naim, M et al (1999). Developing lean and agile supply chains in the UK housebuilding industry. proceedings IGLC-7 (USA, University of California).
- Naim, M and Barlow, J (2003). An innovative supply chain strategy for customized housing. *Construction Management and Economics* 21, pp. 593-602.

- Norwegian State Housing Bank (2006). *Adequate and secure housing for all*. (Norwegian State Housing Bank).
- Oostrom, M van (2001). "What people want, where people live": New housing policy in the Netherlands, *Journal of Housing and the Built Environment* 16.
- Plegt (2007). *Preliminary report*. Bachelor thesis Civil Engineering University of Twente, unpublished.
- Priemus, H (2001). A new housing policy for the Netherlands (2000-2010): a mixed bag, *Journal of Housing and the Built Environment* 16.
- Pries, F & Heijgen, P van (2005). *Een eeuw innovatie in de bouw*.
<http://www.buildingbusiness.com/artikel.asp?ID=1249> visited May 2007.
- PSIB (2007). Projectbeschrijvingen Praktijkprojecten Woningbouw email Aart Karssen 5th of June 2007.
- Ridder, H de & Vrijhoef, R (2006). Living Building Concept vernieuwt de bouw revolutionair. *Building Innovation november/december 2006*.
- Thomson, D.S et al (2003). Managing value and quality in design. *Building Research & Information* 31, pp. 334-345.
- VROM (2000). Nota wonen Mensen Wensen Wonen Samenvatting (Den Haag, VROM).
- VROM (2005). Netherlands Housing Research (Den Haag, VROM).
- Winch, G.M (2000). Institutional reform in British construction: partnering and private finance, *Building Research & Information* 28, pp. 141-155.