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Understanding the Emergence of Policies

Revising Building Regulations in Light of the
Three Pillars of Sustainability

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<p>Abstract: The building regulations for the Norwegian construction industry (TEK10) undergo a major revision in 2015. This case study firstly examines to what degree social and economical consequences are taken in consideration when deciding energy (environmental) requirements in buildings. Secondly, it looks at the analysis and assessments that lay the basis for the decision of new requirements. The main research object of this paper is formal regulation of construction/housing in Norway. In addition to this documentation study, semi structured, open-ended, in-depth interviews with key actors were conducted. An extensive literature review forms the analytic background of the work. The economical and social consequences of new building requirements are significant. These are, however, found to be to a smaller degree taken in consideration than the environmental perspective. The energy requirements in TEK10 are currently being updated, and the case study will not take the final requirements in consideration. However, the suggested regulations are currently sent out for comment, and it is possible to do a study on this stage. Further research on the topic is needed in light of the final regulations. Higher requirements to energy use in buildings are expected to make houses more expensive, and therefore drive the housing market up. The literature study revealed surprisingly few building regulation policy studies are found. The limited number of such studies reveals a lack in the research literature, considering the implications they have.</p>
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Keywords:

1. Building Policy
2. TEK10
3. Three-pillar sustainability
4. Energy requirements

Foreword

This report is written as a master thesis in the course in TBA4910 Prosjektledelse.

The master thesis consists of two main elements; one eight page paper, 'Understanding the emergence of policies – revising building regulations in light of the three pillars of sustainability' (Lunke et al., 2015), that was submitted to IPMA World Congress 2015, and one process report. The paper is included as Appendix A. Much of the content will be overlapping in the process report and the paper. This is done with the intention that the process report should cover every aspect that is covered in the paper, and both the paper and the process report are therefore independent. The process report will elaborate the paper, and include further theory and discussion that did not fit within the limitations of the paper.

The study goes outside my own field of study, and includes economics and politics. Working with the master thesis has been exciting, and opened my eyes for other fields of study.

I would like to thank my supervisors Tore Haavaldsen and Jardar Lohne for helpful feedback along the way.

Øyvind Lunke

Trondheim, June 2015

Summary

The building regulations for the Norwegian construction industry (TEK10) undergo a major revision in 2015. The regulations have been subject for major critique, both in public media and by building specialists, often because of the increased building cost. Three-pillar sustainability is an explicit criterion for all development in Norway, and the study examines how this is reflected in the making of building policies.

The scope in this study is narrowed, so that the case is limited only to the energy requirements in TEK10. The case study firstly examines to what degree social and economical consequences are taken in consideration when deciding environmental requirements in buildings. Secondly, it looks at the analysis and assessments that lay the basis for the decision of new requirements.

The main research object of this paper is the reports and assessments that form the basis of the formal regulation of construction/housing in Norway. In addition to this documentation study, semi structured, open-ended, in-depth interviews with key actors in the building industry were conducted. An extensive literature review forms the analytic background of the work. The economical and social consequences of new building requirements are significant.

The social and economical consequences are, however, found to be to a smaller degree taken in consideration than the environmental perspective. Higher requirements to energy use in buildings are expected to make houses more expensive, and therefore drive the housing market up.

The interviews show a disagreement with some of the measures central to todays TEK10. The study reveals deficient alternative analysis and impact assessments, and concludes that policies rarely are discussed at a high principle level, and the official reports therefore regard the more practical measures. This might also be the case in other Norwegian policies.

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1 Introduction

Our world is constantly growing. We are currently over 7 billion people, and we are struggling to keep up with the growth. The planet has limited capacity. With more mouths to feed, higher consumption and smaller space, this has a huge impact on the environment. Thus, global warming and climate change has become one of the biggest challenges of our time, and a simple solution does not exist.

That is; a simple solution that we are willing to execute does not exist. Because we *could* – in theory – slow the global warming by stopping the continuously growth in consumption. We *could* distribute the food better, and by that feed the whole population. We *could* live with a standard of living equal to what we had in the 1980's, and be able to sustain this for the whole population. But as easy as it may seem, this is not something we will do unless we are forced to. Humanity has proven itself unable to use it's knowledge about it's impact on the environmental changes to actually change our behavior (Randers, 2012). Who are able to force us to such change? Either the government, by steering strategically towards a more sustainable future using policies, or the planet itself, by its already mentioned limited supplies. The latter is not a wanted development.

Through important and trend setting reports such as 'Limits To Growth' (Meadows et al., 1972), and 'Our Common Future' (WECD and Brundtland, 1987), "sustainability" has become an important and much used term. However, the term is diverse, and is interpreted in quite different ways, depending on whom you ask. The most widespread understanding is a three pillar model, which divides the concept of sustainability into three aspects; social, economical and environmental. This means; we do not only have to save the environment, we must do it in a way that we can afford, and a way that does not harm our society.

Knowing this, it is important to think long term, and do the right things now. It is important that we run consistent politics on this matter, so that our whole society will move in the same direction. This is where the term sustainable policies come in. In the same way that sustainability is a success criteria for projects (along with efficiency, effectiveness, impact and relevance) (OECD, 1991), it could also be used as a criteria when assessing policies.

1.1 The choice of case

For this master thesis, I have chosen the energy requirements in the Norwegian building regulations (TEK10) as a case in order to investigate the balance of the three pillars of sustainability in Norwegian policies. TEK10 was chosen for a number of reasons.

First, TEK10 was chosen for the explicitly stated three-pillar sustainability that forms the basis for building policies in Norway. The Norwegian government has stated that “sustainability should be a fundamental principle for all development in Norway and the rest of the world” (Ministry of Environment, 2012). The white paper ‘Good buildings for a better future’ (Ministry of Local Government and Regional Development, 2012) states that the three-pillar model should be used as a basis to understand sustainability. Therefore, the building regulations are a relevant case in order to study to how the three-pillars of sustainability are balanced in public policy.

Secondly, TEK10 has been subject to major public debate. Some have argued that small apartments will be harder, or even impossible to build if one were to follow the regulations, while others have problematized the increased building cost. The increased insulation needed in a passive house decreases the living space. For apartments, this typically represents a two per cent decrease in living space (Rattsø, 2015), but for a small house (200m²) it might represent an eight per cent decrease (16 m²) (Nylund, 2011). The housing market in Norway is heated, and TEK10 has been said to be one possible reason (Kvinge et al., 2012). The energy requirements represent the largest extra cost as a result of stricter regulations in TEK10 (Rattsø 2015, p. 29).

Third, a case study of TEK10 will open to investigate to what extent an alternative analysis and impact assessment has been carried out. The ‘Instructions for Official Studies and Reports’ (Ministry of Local Government and Modernisation, 2005) states that an impact assessment and an analysis of alternatives should be conducted. However, the instructions have gotten critique for not being followed, and that the actual executed analyses are poor and few (Aarseth, 2014). This study will investigate whether this is true also for the energy requirements in TEK10.

1.2 Research questions

The research questions are as followed:

- Have the energy goals in TEK10, including proposed revisions, been designed to comply with a three-pillar sustainability principle?
- To what extent has a sufficient alternative analysis been executed, as made mandatory in the 'Instructions for Official Studies and Reports'?
- To what extents have the economical and social consequences that the energy requirements in TEK10 entail been taken in consideration?

2 Method

2.1 Case study

According to Yin (2014), the case study is the preferred research method in situations where the main research questions are ‘why’ and ‘how’, where the researcher has little or no control over the behavioral events, and where the study is of a contemporary phenomenon, as opposed to historic (p. 2). The criteria fit this study.

Flyvbjerg (2006) writes about the case study, and the choice of case. A *critical case* has a strategic importance in relation to the general problem:

“For example, an occupational medicine clinic wanted to investigate whether people working with organic solvents suffered brain damage. Instead of choosing a representative sample among all those enterprises in the clinic’s area that used organic solvents, the clinic strategically located a single workplace where all safety regulations on cleanliness, air quality, and the like had been fulfilled. This model enterprise became a critical case: If brain damage related to organic solvents could be found at this particular facility, then it was likely that the same problem would exist at other enterprises that were less careful with safety regulations for organic solvents.” (p. 230).

Although the case with TEK10 is not as obvious a critical case as the one in Flyvbjerg’s example, the explicit three-pillar sustainability stated by the Ministry of Environment (2012), makes the policy a critical case. If the three pillars are not balanced in a policy that has explicitly stated the importance of the concept, the problem might very well be present in other policies as well.

2.2 Literature review

The literature review is conducted in accordance to Blumberg (2014). The review regards the concept of sustainable policies and three-pillar sustainability. Relevant literature has been found using online search engines such as BIBSYS Ask and Scopus, and central keywords include sustainability, building requirements, TEK10, policies, policy-making etc.

2.3 Document study

The document study includes official white papers (Stortingsmeldinger), and reports and analyses executed in connection to the 2015 revision of the energy requirements in TEK10. Some other, independent, reports are also included, but the focus lies on the official documentation and assessments. Due to the nature of these reports and white papers, the majority is only available in Norwegian.

2.4 Interviews

In addition to the literature and document study, four semi-structured, open-ended interviews were conducted. The informants were picked based on expressed disagreement with TEK10 in public media, as well as advices from other informants. By doing this, the study does not intend to reflect a balanced set of arguments from all different stakeholders, but rather investigate views and arguments that are not well reflected in official reports, as well as getting information from people who has first hand experience with TEK10 in practice.

The informants are as followed:

Name: Katharina Bramslev

Company/line of business: CEO Grønn Byggallianse

Relevance to TEK10: Secretary for the Arnstad et al. (2010) report, CEO of Grønn byggallianse, which is a network for environmentally interested real estate developers.

Name: Helge Skarphagen

Company/line of business: Ground-sourced heat pumps

Relevance to TEK10: Recommended by Ramstad. Has been critical to TEK10 in public media, see Nylund (2011) and Skarphagen (2004).

Name: Randi Kalskin Ramstad

Company/line of business: Ground sourced heating in Asplan Viak, project leader NTNU

Relevance to TEK10: Has been critical to the proposed revisions in TEK10, see Grønlien (2015a).

Name: Sturla Ingebrigtsen

Company/line of business: Commercial director, Systemair

Relevance to TEK10: Has stated publicly that lobbyism might have been a significant factor in the making of TEK10 (Grønlien, 2015b).

The interviews circulated around the informant's experience with TEK10, and the subjects that they felt most important. Due to the different professions of the informants, the content of each interview varies. Some answers were therefore outside of what this study regards, and only the relevant information is included in the findings. A summary of each interview is included in appendix B to E. The summaries are written in Norwegian, as the interviews were held in Norwegian.

3 Theory

This chapter will cover relevant theory to understand the concept of sustainability, and the concept of policies. The chapter also includes one section about TEK10.

3.1 Sustainability

Section 3.1 provides theory regarding the concept of sustainability, including a brief history, different pillar-models, different levels of sustainability, as well as a section of how the term is used as a principle in Norwegian policy-making.

The understanding of the term varies, depending on whom you are talking to. The term is one of the largest buzzwords today, and we may talk about very different concepts, such as ‘sustainable agriculture’, ‘sustainable economics’ and ‘sustainable cars’ (Gomis et al., 2011). What do all of these have in common?

The term ‘sustainability’ derives from Latin, and is composed of two elements; ‘sus’ meaning holding up, and ‘tenere’ meaning ‘over a long period’. This translates to the ability to uphold something over time (Lædre et al., 2012).

3.1.1 History of sustainability

The concept of sustainability is fairly new, and is often linked to environmental problems and global warming. In 1972, Meadows et al. (1972) published the report ‘Limits To Growth’ to the Club of Rome. The report did not use ‘sustainability’ as a term, but rather discussed the danger of ‘overshoot’. The report was a forerunner to the discussion whether we could uphold the current growth in economy and wealth. The report concluded that (1) the world is small, and (2) that the continuous growth would have to stop at some point. It also concluded that there was a real danger of overshoot, meaning our growth would exceed the capacity of our planet.

Later, the ‘Brundtland Report’ (WECD and Brundtland, 1987) introduced the term ‘sustainable development’, defined as followed:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Following the Brundtland Report, the term has become popular, and the definition from 1987 is still widely used. The last 25 years have seen many international environmental conferences, and there are reasons to assume that our over-all awareness of the climate changes is bigger than ever. Most countries in the UN have a ministry that works with environmental questions. Knowing this, it is a paradox that “[...] the global human enterprise [is] rapidly becoming less sustainable, and not more” (Adams, 2006), p. 3). According to Randers (2012), we have wasted the last 25 years with “fruitless international negotiations with minimal impact on the global emissions”.

3.1.2 Three pillars of sustainability

The understanding of sustainability as a combination of different aspects is common. The World Bank (1997) divides the term into social, human, man-made and natural capital. Grosskurth and Rotmans (2005) use the term SCENE-model to refer to social, environmental and economic aspects. UN-DPCSD (1996) also includes institutional capital as an aspect. The model is also called ‘Triple bottom line’ (TBL or 3BL), see Elkington (1998). The different models vary, but they all have some sort of distinguishing between the social, environmental and economic aspects of sustainability.

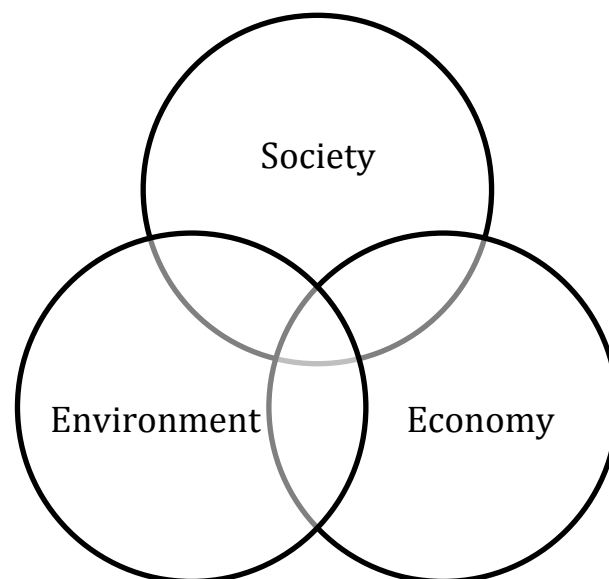


Figure 1 - The three pillars of sustainability

The essence of the three-pillar model is the understanding that the economy, environment and society all depend on each other, as illustrated in Figure 1. The economy exists within a society, which again exists within the boundaries of the environment. Further, the society will have impact on the environment, and they are

therefore interdependent. An impact on for example the environment will eventually affect the economy and society as well.

One problem with the three-pillar model is that it implies that trade-offs between the pillars are possible (Gibson, 2006). This has led to the classifications of 'strong' and 'weak' sustainability. The first classification refers to a measure that is considered sustainable in all three aspects, and the latter referring to a measure where trade-offs between the pillars have been made. According to Adams (2006), trade-offs is the "major reason why the environment continues to be degraded and development does not achieve desirable equity goals" (p. 4).

There exists a wide selection of different tools used to assess sustainability, but this report will not discuss this any further. See Ness et al. (2007) for an overview of different tools.

3.1.3 Three levels of sustainability

In addition to the three pillars of sustainability, Haavaldsen et al. (2014) emphasize that one should distinguish between different levels, or aspects, of a project. These levels are operational, tactical and strategic. Each level relates to its own products, or goals. The levels are illustrated as a pyramid in Figure 2.

At a strategic level, one asks the question 'why?'. *Why* should this project or this policy be executed? The strategic level refers to the purpose of the measure. Take a project, for example the building of a new school. At a strategic level, this is executed because one wants to give children in an area a good education, because that is good for the society as a whole. The strategic level considers the long-time purpose of the project or policy. The tactical level refers to the question 'what?'. What should one do to secure that the children in this area get a satisfying education? The answer in this case is to build a school. At an operational level, the question one asks is 'how?'. How should we build this school? Success at this level means that one delivers what one was meant to deliver. When one discusses sustainability at an operational level, it relates to the use of the right materials, and the time and cost of the building.

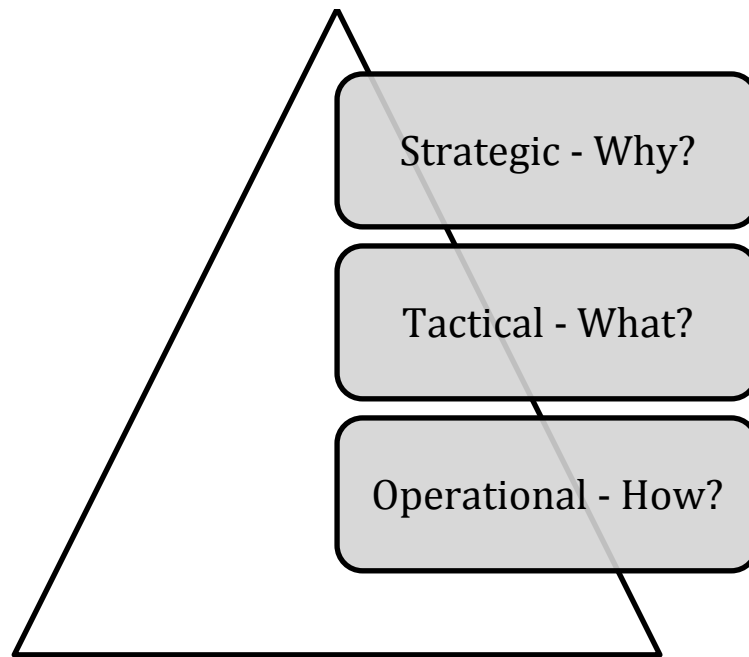


Figure 2 - Three levels of a project

A project may be considered sustainable at one level, but not at another. Take the example with the building of a new school. With the use of environmental-friendly building components, a well-managed construction phase and no accidents, the project may be considered successful and sustainable at an operational level. However, if the area did not have a need for a new school, but rather the need for more resources to the already existing schools, the project is unsuccessful and unsustainable at a strategic level.

The three levels of sustainability are central when discussing policies, as policies often regard the long-term perspective.

3.1.4 Sustainability in official papers

The Norwegian Ministry of Finance provides a definition of sustainability in investment projects. The definition reads:

“[t]he degree to which the investment contributes to the realization of goals [effects] and purposes [wider societal ambitions] after the project is realized and through the expected life cycle. A consideration of net benefit flows over time.”

(Finansdepartementet, 2008, translation by Lædre et al., 2012)

This definition refers to different goals; results, effects and purposes. See Figure 3. These goals is typically linked to the before mentioned three levels of a project. The

operational level delivers the *results*, the tactical stage is linked to the *effects* the results are intended to have, and the strategic goals are the *purpose* of these effects. The definition also takes in consideration the net benefit flows over time. This is the sum of negative and positive impacts during the project's lifetime.



Figure 3 - Different goals of a project, after Samset (2008)

It is explicitly stated that the development in Norway should be based on the concept of sustainability. In the white paper 'Norwegian climate policy' (Ministry of Environment, 2012 p. 8), it is stated that "[s]ustainability should be a fundamental principle for all development in Norway and the rest of the world". The white paper 'Good buildings for a better future' (Ministry of Local Government and Regional Development, 2012) states that the three-pillar model should be used as a basis to understand sustainability.

3.2 Policies

Section 3.2 provides relevant theory about policies. It considers the width of the term, and describes policies at different levels. The section also includes an introduction to the current procedure in Norway, and what framework exists to secure new policies.

3.2.1 What is a policy?

In the same way that sustainability is a diverse term, so is policy. One may speak of Norway's over-all environmental politics as a 'policy', but the term can also refer to a specific instrument, for instance the practice of letting electric cars drive in the line intended for public transport.

"[P]olicies may reflect a variety of intentions and ideas: some vague, some specific, some conflicting, some unarticulated. They can [...] even be the unintended or undeliberated consequences of professional practices or bureaucratic routines" (Page 2006, p. 205)

Public policies determine the water we drink, the roads we drive on, the safety on board on an airplane, and the technical solutions in our buildings. Torjman (2005) states that a

“public policy seeks to achieve a desired goal that is considered to be in the best interest of all members of society” (p. 4). The development of a policy is a process that helps address the problems and goals.

The Norwegian word ‘politikk’ is transferred to ‘policy’ in public documents, for instance, the white paper ‘Norsk Klimapolitikk’ translates to ‘Norwegian Climate Policy’. In other words; the term can be disturbing, and a classification of different policy levels is necessary to understand what one are discussing.

3.2.2 Four levels of policy

As mentioned in section 3.1, sustainability can be discussed at widely different levels. The same applies to policies. Page (2006) describes four levels of abstraction at which policies can be viewed, first described by Pressman and Wildavsky (1973). The four levels are principles, lines, measures, and practices. The two first relates to the intentions of the policy, while the latter refers to the actions of a policy.

Principles are general views and ideology, and lay the basis for how a public policy should be conducted. Examples of principles typically include privatization, deregulation, or ‘best available technology’. Principles might be even broader, and refer to terms even harder to define, for example socialism. Socialism will eventually generate a wide set of policies, from public ownership to worker’s rights.

Lines are not as broad as the principles, but refer to strategies that regulate a particular field. Much of the discussion of the policy agenda is at this level. The expressed goal of having passive houses in 2015 and near-zero houses in 2020 is an example of a policy line.

Measures are the specific instruments that are used to give effect to these lines. In our case, the measures refer to the actual energy requirements.

Practices, or actions, are the specific behavior that executes the instruments.

These four levels of abstraction in policies can be related to the before mentioned three levels of sustainability, and is shown in Figure 4.

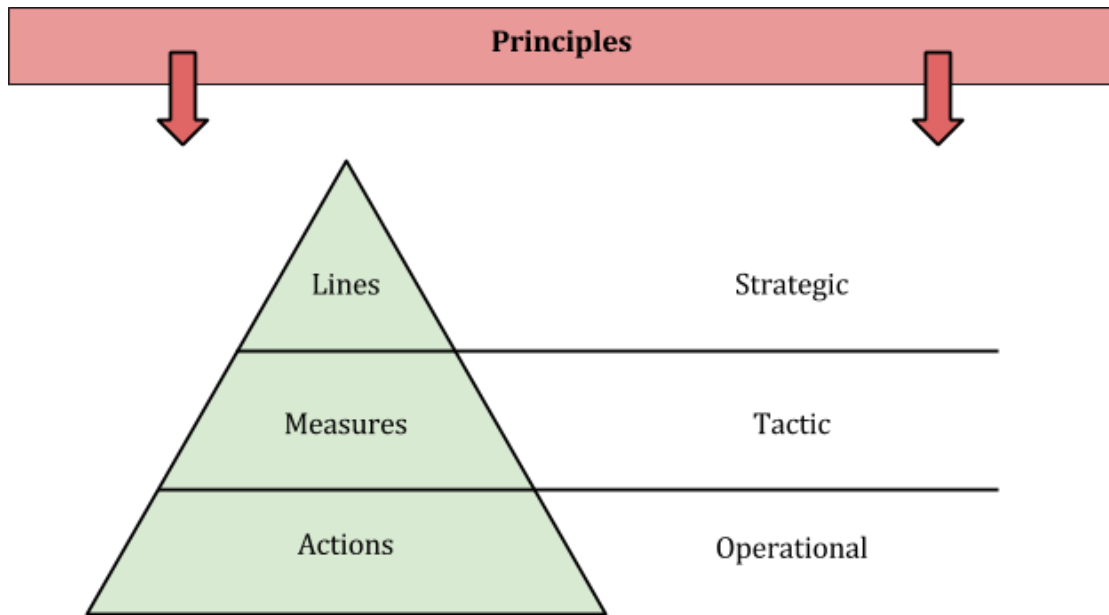


Figure 4 - The levels of a policy, related to three levels of sustainability

Notice that Pressman and Wildavsky's (1973) model includes a fourth level that is not presented in the before mentioned models. The *principles* can be seen as cross-sectional and cross-national values. Privatization is a typical example of a principle. The principle will eventually determine which lines, measures, and actions will be taken.

This report does not go in detail on where policies stem from, but as Page (2006) points out, a policy may actually stem from each of these four levels.

3.2.3 Garbage can model

Cohen et al. (1972) described decision-making in organizations with the 'Garbage can model', in what they called organizational anarchy. The model explains organizational decision-making as influenced by four individual streams; problems, solutions, choice opportunities and participants. *Problems* are issues that require attention, and demand some sort of solution. The *solutions*, however, are independent from problems. Solutions are answers to un-asked questions. *Choice opportunities* are occasions where the organizations are expected to produce some kind of decision. The *participants* in the decision-making come and go. It might be the case that one person has a special interest in one solution or problem, and this one person's participation may affect the final decision.

The garbage can model describes these four streams as running independently through the organization, and that what happens in the organization is a random result of these streams.

The garbage can model and the four levels of policy are included in this report to illustrate how policies may be a result of coincidence and of stakeholders being at the right place to the right time, and not always a strategic plan. This may come in conflict with the earlier mentioned statement from Torjman (2005) that a “public policy seeks to achieve a desired goal that is considered to be in the best interest of all members of society”.

3.2.4 Policy-making in Norway

Policy making in Norway is quality assured by the ‘Instructions for Official Studies and Reports’ (Ministry of Local Government and Modernisation, 2005), stating:

“The instructions apply to all work apply to all work on official studies, regulations, reforms and measures, and to propositions and reports to the Storting. These Instructions apply to studies carried out by, or at the request of government bodies, i.e. ministries, directorates and other subordinate agencies.”
(p.3)

The purpose of the instructions is to “ensure the proper preparation and administration of all work relating to official reforms, amendments to regulations and other measures”. The purpose is achieved in the following way:

- The instructions make it mandatory to study financial, administrative and other significant consequences.
- The instructions prescribe rules for the procedure to be followed in the preparatory stages of reforms and other measures [...].
- The instructions contain provisions to ensure that the institution responsible for the matter assesses all relevant and significant consequences, and that the bodies affected and the general public is included in the decision-making process before a decision is made.
- The instructions make it mandatory to assess alternative instruments.

(Ministry of Local Government and Modernisation 2005, p.1)

The instructions reflect a three-pillar model, without using the term explicitly. The 'other significant purposes' stated in the first bullet point is later explained to include environmental consequences, consequences for the business sector, consequences for the health of the population, etc.

The intention with the 'Instructions for Official Studies and Reports' are good, however, they have been subject for critique. Or rather, the execution of the mandatory studies has been criticized. Hagevik and Bøgh (2012) concluded that the instructions were not followed on many fields. The report shows deficient impact assessments, and deficient alternative analysis. It further explains that when the politicians have decided on one solution, a broad analysis of impacts seems less relevant, and is therefore not executed. Also, an analysis of alternatives may seem unnecessary, when one already has decided on a solution.

The Office of the Auditor General (Riksrevisjonen) exist to assure that "the community's resources and assets are used and administered in keeping with the Storting's decisions" (Riksrevisjonen, 2014). In 2013, the office published a report that looked into the early phase of public investments and policy-making, to evaluate whether the necessary preparations and assessments were executed. The report conclude that consequences are to a small extent being described and quantified, that economical analysis are seldom executed and that alternatives are to a small extent being made visible (Riksrevisjonen 2013, p. 7). In other words, the Instructions for Official Studies and Reports are not followed, according to The Office of the Auditor General. This may, in worst case, lead to unsustainable policies and investments that have unintentional negative effects.

OECD has looked at why the necessary analyses often are poorly performed. The report concludes that "a lack of incentives to comply with the guidelines [...] erodes efforts to establish evidence-based decision making as a common policy practice (OECD 2013, 65)". OECD proposes that an authority should check all assessments and analysis.

Literature shows that quantifiable values, typically the economic concerns, often overshadow other concerns such as the social and environmental (Ackerman and Heinzerling, 2002). The values that are difficult to quantify are easy to undermine, or twist their significance into what fits your own opinion (Laedre et al., 2015). In TEK10, the quantifiable values are typically U-values, CO₂ emissions, the actual extra building

cost etc. Values that are harder to quantify includes health-risk, possible impact on the housing market, and living comfort.

3.2.5 Economical analysis

An economical analysis is a tool used to assess policies and investments. The purpose is to map and make visible the consequences of alternatives before deciding an investment or a policy (Hagen et al., 2012).

The Norwegian Government Agency for Financial Management (2014) provides a guide to economical analysis, 'Veileder i samfunnsøkonomiske analyser'. The guide is supposed to increase the competency on performing economical analysis in the government. It describes eight steps leading up to a decision solving the initial problem. The eight steps are shown in Figure 5.

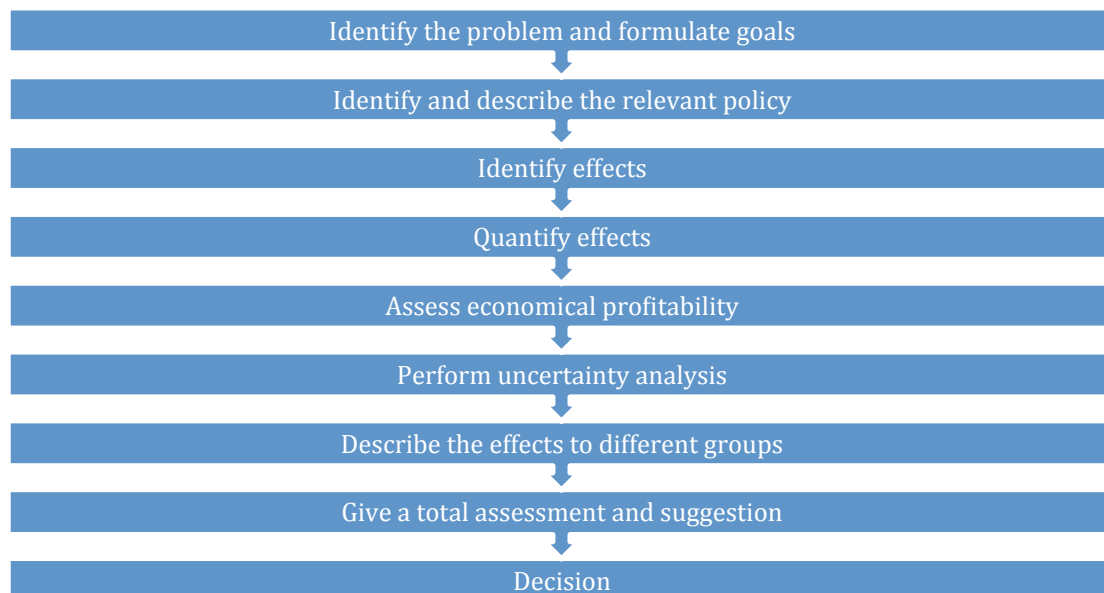


Figure 5 – Eight steps of an economical analysis (Government Agency for Financial Management, 2014)

Hagen et al. (2012, p. 19) describes three main types of economical analysis; cost-benefit analysis, cost-effectiveness analysis, and cost-impact analysis.

- A *cost-benefit analysis* quantifies all effects, both positive and negative, in money. The main principle is that a consequence is worth what the society are willing to pay for it. If the will to pay is greater than the costs, the measure is economically profitable.
- If the alternative measures have the same benefits, the decision will only depend

on the costs. A *cost-effectiveness analysis* will range the measures after their costs, and that way find the solution that realize the intended goal to the lowest cost.

- In some cases, it is not desired to quantify the benefits. One will then quantify the costs, but describe the benefits in a qualitative way. This is called a *cost-impact analysis*.

It is important to notice that even though it is mandatory to perform consequence assessment and economical analysis, the guidelines do not provide an answer to how extensive an analysis should be.

3.3 TEK10

This section provides a brief introduction to the building regulations TEK10, as well as examples of the critique the regulations have gotten.

3.3.1 What is TEK10?

The ‘Regulations on technical requirements for building works’ (TEK10) (Ministry of Local Government and Modernisation, 2015a) are the current framework for land-based construction in Norway. “The purpose of the regulations is to secure that measures are planned, designed and executed with regards to visual quality, universal design, and that the measure fulfill the technical criteria of safety, environment, health and energy” (§ 1-1) (our translation). TEK10 determines how we build our buildings. The regulations cover all technical aspects of a building, from universal design to fire safety, from construction safety to energy use.

The current regulations were introduced in 2010, and replaced TEK07. They were then updated to match a EU directive regarding energy performance in buildings (European Parliament, Council of the European Union, 2010), and introduced the goal of passive house standard in 2015, and near-zero houses in 2020. The plan is to update the regulations every fifth year. In 2015, the energy requirements are to be revised. The suggested revision was sent out for hearing in February, see Ministry of Local Government and Modernisation (2015b).

As a basis for the new requirements, two reports were conducted. Rambøll (2013) gave their suggestion to new requirements, which did not include an overall impact assessment. The report stated that it expected that “more extensive analyses should be

the basis of the final requirements” (part 3, p. 81). Such an extensive analysis was seemingly conducted with Multiconsult's (2014) impact assessment. The report includes an economic analysis, concluding that many of the measures are non-profitable, both in a public and a private perspective (p. 6). The total cost of the measure will most likely be NOK 1.6 billion (approx. \$ 200 million). This estimate, however, is explicitly uncertain.

There are four main measures to be executed in order to reach the goal of near-zero energy houses; more insulation, airtight construction, energy effective windows, and fewer thermal bridges (Ministry of Local Government and Modernisation 2015b, p.13).

3.3.2 Climate gas emissions and energy efficiency

According to the UN, energy efficiency in buildings is one of the most important and cost-effective ways of reducing the global emissions of climate gasses (Intergovernmental Panel on Climate Change, 2007). However, this does not apply to all countries. Norwegian buildings stands for about one third of the country's land-based energy use, but only three per cent of the CO₂ emissions (Klimakur 2020 2010 p. 155). The reason is Norway's vast production of renewable energy made from hydropower, and the fact that oil-based heating is no longer permitted.

The strict energy requirements in TEK10 do therefore not represent a large reduction in climate gas emissions. This is also stated in the white paper 'Good buildings for a better future' (Ministry of Local Government and Regional Development 2012 p. 73). Further, the report states that energy efficiency is the most environmental friendly way to secure the energy supply in the future.

3.3.3 Critique of TEK10

TEK10 has gotten major critique, both in the public debate and by building specialists. Much of the critique is directed towards the criteria to universal design, but also at the energy requirements.

The increased insulation in passive houses decreases the living space. For apartments, this means a two per cent decrease in living space (Rattsø, 2015), but for a small house (200m²) it typically represents an eight per cent decrease (16 m²) (Nylund, 2011). In addition, the regulations have a direct cost in terms of more technical complex solutions. 'The Building Cost Index' shows an increase in building costs of 46.6 per cent between

2005 and 2015 for a single house (Statistics Norway, 2015). The suggested new requirements will have an additional cost around NOK 150.000 (approx. \$ 20.000) for a 200m² house (Multiconsult, 2014). The energy requirements represent the largest extra cost as a result of stricter regulations in TEK10 (Rattsø 2015, p. 29). Hustad (2014) states the technical requirements as the main reason for a significant fall in the building of new houses in 2014.

Skarphagen (2004) emphasized the architectural limitations a passive house may cause, and that there will be a bigger architectural freedom with ground-sourced heat pumps.

4 Findings

This chapter presents the findings in this case study. The chapter is divided into two parts; document study and interviews.

4.1 Document study

This section presents the findings in official white papers and reports.

4.1.1 Three-pillar sustainability

The report “Good buildings for a better society” (Ministry of Local Government and Regional Development 2012, p.11) states that the “building politics should be based on the principle of sustainability” (our translation), and emphasizes the principle of three-pillar sustainability. The social aspect includes “safety, indoor climate, quality, well-being, accessibility, and universal design”. Under the economy-pillar, the report states that value-creation, cost-efficiency, productivity, life-circle costs and economics and should form a basis for sustainable development. The possible effects the cost would have on the building market in the long run are not an explicit criteria. However, the report Norwegian Climate Politics (Ministry of Environment, 2012) states that “Stricter energy requirements [may] lead to increased building costs. It is not possible to determine for sure the effect of this measure in 2020” (p. 199) (our translation). Other reports argue that new requirements will lead to innovation in the industry, and that the cost of new measures therefore will decline in the years to come.

Multiconsult (2014) states that their suggested level of requirements are based on private and public economics, as well as “some over-all assessments of environmental and social parameters”, and found the “most sustainable level” (p. 5) (our translations). However, the author has not been able to find these assessments of environmental and social parameters.

A common argument is that “environmental investments in buildings are economically profitable” (Ministry of Local Government and Regional Development, 2009). The reason for the investments not already being executed is because the industry has yet to see the possibilities lying in these solutions (THEMA Consulting Group, 2011). This may be true for some measures, such as moving from oil-fueled heating to other sources of heating, but it is not the case in other scenarios. The Norwegian government says that the new energy regulations in TEK will most likely *not* be economically profitable.

4.1.2 Alternative analysis

Multiconsult (2014) does make an assessment of alternative measures, but the differences between the alternatives are small, typically which U-values etc. should be used. An extensive alternative analysis seems to be missing from official reports, meaning that other lines than the one leading to near-zero houses in 2020 are not discussed. It would be natural to include a study of what alternative actions that could be done, as well as the alternative cost.

Official documents seem to focus on two things; the possible saved energy, and possible cost, the first getting most attention. The social consequences, such as the fact that it may make it harder for young people to enter the market are little discussed. The exception is health-issues. The problem with passive-houses, indoor climate and ventilation is to some degree discussed, concluding that there is a need for more knowledge on the field.

4.1.3 Effect on building cost

During the ten last years, the building cost has increased by 46 percent, according to Statistics Norway (2015). The energy requirements do, however, only represent a small fraction of the increased cost. A report by NIBR shows that different entrepreneurs calculated the new energy requirements in TEK10 represented an increased building cost of NOK 100.000 to NOK 195.000 compared to the previous TEK97 (Kvinge et al. 2012, p. 67). When including all other revisions as well, for example requirements to universal design, elevator etc., the extra cost varied from NOK 351.500 to NOK 600.000.

Kvinge et al. (2012) concludes that the building cost had increased the last seven years, but not as much as the price of new apartments in the same timeframe. This may have two explanations; either has the price of land increased, or the profit in the building industry is higher.

4.2 Interviews

When talking to the informants, it became clear that there are two distinct schools of thought when it comes to energy efficiency in buildings; one being passive house, and the other being heat pumps.

There exists a tendency among some of the respondents that they have little knowledge about the political process behind a policy. Still, they had their clear opinions about what different measures should be taken. When asked, the answer from one of the respondents was that dealing with the governments on policies like this is like “banging your head against a wall”, meaning; it seems impossible that a response to the hearing will have any real impact.

However, one informant emphasized that it is important that the industry speaks up when a policy like TEK10 is out for hearing, and that this is the only way the politicians are able to make a qualified decision. Two of the informants had plans of submitting an answer to the hearing.

The informants show disagreements with some aspects of the energy requirements in TEK. The main arguments against the regulations include:

- TEK only focuses on a limited amount of “tools” to cope with energy use in buildings: Insulation, airtight construction, more energy effective windows, and fewer thermal bridges (Ministry of Local Government and Modernisation 2015b, p. 13). Some informants wanted the government to use a “bigger toolbox”, and use for instance ground-sourced heat pumps, which “provides a solution that also takes in consideration the indoor climate and over-all comfort”.
- “We are heading in the wrong in the wrong direction”, says one informant who works in the heat-pump industry. “Passive houses are not the solution” partly because of the risk of making a suboptimal indoor-climate. One informant emphasized the consequence this might have in an office-space, and how much this could cost a company in form of lower productivity.
- “There is something fundamentally wrong by using electricity for heating buildings. It is of high-value, and for heating we could use almost anything”, says one of the informants. “It is a paradox that the Ministry of Petroleum and Energy has a goal of moving from oil and electricity to other energy resources, and at the same time the Ministry of Local Government and Modernisation makes it easier to use direct electricity in buildings. It seems inconsistent”, talking of a suggested regulation that will make it easier to use direct electricity in buildings under 1000 m².

In sum, these responses show a disagreement with some aspects of TEK10 and it's proposed revisions. Also, they reflect a frustration with the political process behind the

policy-making. The informants seem to believe that lobbying plays a big role in the decision-making. "One must be naive to think that lobbying does not apply to the development of policies like this," says one informant. "Some lines of business have the economy to hire external help. Lobbyism is a business on it's own".

When asked why the government is heading in this direction, even if it might not be the best solution, one informant uses the term "Tordenskiolds army". The term describes a "group that gives the impression of being large, while in reality the same persons take different positions" (Mardal, 2014). By this the respondent meant that when the government asks the same people the same question year after year, they get the same answer, and the group who supports passive-houses seems larger than in reality. The informant works with heat pumps, and felt that the government did not see the possibilities that their line of business was able to provide.

5 Discussion

This section will discuss the findings in this study. In addition to discussing the findings, the section also includes a critique of the study itself, discussing possible weaknesses.

5.1 Three pillar sustainability

The energy requirements in TEK10 were chosen as the case in this study because three-pillar sustainability is a common aspect of environmental-policies. If the study shows that the three pillars are not balanced in the making of such a policy, this might well also be the case for other public policies. The government has explicitly stated that building requirements should be based on the concept of three-pillar sustainability. The reports on TEK10 seem to focus on the possible saved energy, and the possible cost. However, while the possible long-term effects of saved energy are much discussed, the possible effects of increased cost are not. What effects do new requirements every five years have on the housing market? Norway already has a heated housing market, which role does the energy requirements play in this?

In other words; it is hard to see in what way all three pillars are taken in consideration in official reports. The quantifiable effects are to a larger degree discussed than the non-quantifiable, as problematized by Ackerman and Heinzerling (2002)

Haavaldsen et al. (2014) emphasized the importance of distinguishing between strategic, tactical and operational perspectives when discussing sustainability. What is Norway's strategic purpose with the energy requirements in TEK? It might seem obvious that moving towards energy efficient buildings is the right move, but it should still be stated what is the strategic purpose of the requirements, especially when it is stated that "increased energy efficiency in buildings will have smaller effect on the emissions of climate gasses in Norway" (Ministry of Local Government and Regional Development 2012, p. 73). Norway's goal with the energy efficiency is to reduce the total energy use significantly within 2020 (Ministry of Environment, 2012). What is the *purpose* of this goal? Are the actions taken to secure Norway's energy supply in the future? Is it to reduce CO₂ emissions? Is there a plan for exporting our expertise on passive house buildings to other countries? Is it a result of international agreements? Depending on the answer, different actions may be taken. For example, if the goal is to move from fossil energy, bio fuel (e.g. a pellet-stove) may be a solution. However, this

will increase the CO₂ emissions from each house, so electricity may be a better solution if lower total CO₂ emissions are the goal. Torjman (2005) tells us that a public policy seeks to achieve a desired goal, and that “policy development entails the selection of a destination or desired objective” (p. 4). The official white papers and reports do, however, seem to reflect the tactical level of the policy, and not the strategic level, that is, the purpose.

5.2 Alternative analysis

Alternative analysis and alternative cost seems to some degree to be missing from the official reports, even though the ‘Instructions for Official Studies and Reports’ makes an alternative analysis mandatory. The authors will, however, not consider this a breach of the instructions. The decided long-term goal does not open for widely different alternatives to be assessed when revising the requirements, because these alternatives would not comply with the goal of a near-zero level. This finding comply with the ones described by Hagevik and Bøgh (2012).

The ‘Instructions for Official Studies and Reports’ also makes it mandatory to look at significant consequences. The prices of each new measure are discussed, but the same problem emerges here as with the alternative analysis. The combined costs of the long term tactical plan; the possible significant consequences of having a near-zero level in 2020 is not quantified, because each revision of the regulations only regards a small step towards that goal.

The interviews show two schools of thought when it comes to energy efficiency in buildings; passive houses and heat pumps. The two solutions seem to rule each other out, i.e. if one has a passive house, one will have such a small demand for energy that it is unnecessary and too expensive to install a heat pump. And if you have a heat pump, you heat your house so efficient that it seems unnecessary and disproportionately expensive to upgrade the house to a passive house standard. This also complies to the relatively expensive heating method of district heating. This is paradox is somewhat backed by a report from Bygg21 (2014) that states that there is a need for a critical view on how the different environmental measures work together. According to Rattsø (2015, p. 29), a thorough assessment of the regulations is needed to see if the considerations of well-being and energy justifies the development of costs. Such an assessment has yet to be conducted.

5.3 The principles

The goals within the Norwegian energy policy in buildings could be described using Pressman and Wildavsky's (1973) four abstractions of policy, explained in 3.2.2. The *principle* is the general idea that saving energy is the environmental friendly direction of development. The *line* that one has chosen is in this case passive houses and near-zero energy houses. The *measures* are the ones stated in TEK10; more insulation, airtight construction, reducing thermal bridges and energy effective windows. The *action* is the implementation of these measures, for example the practice of an overlapping period between different revisions of the regulations.

The informants mainly discuss the policies at an operational or tactical level, and do not have any clear opinions when it comes to the strategic or principal level. There might be many reasons for this, but one likely factor is that their line of business works with TEK10 at a lower level, typically operational.

The explicit goal within the building sector is to:

“Tighten the energy requirements in TEK to passive house level in 2015, and near-zero energy level in 2020. The government will later decide what will define the passive house and almost-zero level.” (Ministry of Environment, 2012, p. 8)

A much-used model in project management is the SMART-criteria. The model presents five criteria that should guide the setting of an objective in an organization. According to the SMART-criteria, each objective should be:

- **Specific**
- **Measurable**
- **Assignable**
- **Realistic**
- **Time-related**

When the government presented the goal, it was time related, realistic and somewhat assignable. However, it was unspecific and immeasurable, because the terms ‘passive house’ and ‘near-zero’ had yet to be defined. Some might call this poor project management. This might explain the frustration some of the informants experienced with TEK10. Multiconsult (2014) recommends that the definition of ‘near-zero’ should

be set, so there is an agreement between the industry and the government about where we are heading in the future. In the light of project management theories, it is natural to ask why this level has not been set earlier.

5.4 Paradox

If one takes a look at climate policy from a high perspective, Norwegian buildings *are* already climate-friendly, compared to buildings in other countries, because of our clean energy. In other countries, energy efficiency in buildings is one of the cheapest ways of reducing CO₂ emissions, and therefore an understandable action to take as a way of slowing the global warming.

The energy requirements in TEK10 do not focus on other measures, such as building materials. In the building's lifetime, the choice of materials will have impact on its carbon footprint. This was a subject in the public debate in connection with the revision of the energy requirements, see Jørgensen (2015) and Nore (2015).

There might be good reasons to focus on energy efficiency in Norway too, even if it does not have much impact on the CO₂ emissions. Much of our renewable energy is exported, and 'dirty' energy is bought back. However, the purpose is not sufficiently stated in official documents, which might lead one to believe that there is a lack of a strategic purpose.

5.5 Critique of this study

There are some clear weaknesses to this study, which will be discussed in the following.

5.5.1 Few interviews, few aspects

Few interviews were conducted for this study, and it is not possible to generalize from such a few numbers of interviews. Also, the few interviews that were conducted tend to show disagreement with some aspects of TEK10, as the informants were chosen based on their expressed disagreements in public media. This is not a balanced reflection of the public debate in Norway, where many voices also express that TEK10 is definitely the right building regulation for the future. Still, this study did not aim to reflect all current arguments for and against TEK10, but rather point at some problems that are not well reflected in public white papers and reports.

Furthermore, the informants had more knowledge about the actual technical solutions suggested in TEK, rather than the over-all strategic purpose of the regulations. While

this is an interesting observation itself, it does not illustrate how the possible strategic purpose relates to the measures in TEK10. It would be natural to include informants that work with TEK10 on a strategic or political level to also cover this perspective. After all, the politicians are the ones who are responsible for the policy-making.

The users of the buildings are also not represented in these interviews. They are the ones who end up paying the price of new regulations, and their view is essential to cover whether the measures in TEK10 is something one are willing to pay for.

5.5.2 Narrow scope

As this study concludes, alternatives and impacts were not sufficiently assessed in the new revision of TEK10. However, this is probably caused by looking mostly at the new revisions of TEK10, which does not deal with the higher policy levels. To understand which assessments have been made over time, it would be a good idea to widen the scope, and look at the building regulations from for example TEK97 and up until today. This would cover a larger range of reports and assessments, and help cover the strategic purpose in a better way.

5.5.3 Balancing the three pillars of sustainability

It is also worth asking the question if the model of three-pillar sustainability is used correctly in this study. The three-pillar sustainability is used as a basis, but what a 'balance' of the three pillars actually means is naturally hard to define. One might argue that the environmental problems the world is facing are of such a great importance that one has to accept great economical and social sacrifices. This study has emphasized the importance of balancing the three pillars, but is it possible to argue that one pillar is indeed of a greater importance than the others.

See also section 6.2, which discusses other fields that the author finds relevant for future research.

6 Conclusion

This chapter provides a summary of the study's conclusions, as well as directions for further research.

6.1 Conclusion

It is hard to conclude with anything in a study so small as this. However, the findings show some tendencies that may cause problems with today's energy requirements:

- The social consequences are to a smaller degree discussed in official reports than economical and environmental. The reports often include an estimated cost, but what consequences this might have on the prices in the building market seems under-communicated, even though this is an argument that often is used against the requirements. These might have to do with the fact that costs and some environmental factors are easy to quantify, while the social effects might be harder to predict and quantify.
- Alternative lines seem to be little discussed. The author will, however, not regard this as a breach on the 'Instructions for Official Studies and Reports'. This lack of alternative lines is probably because the reports regards a lower level of policy, i.e. measures, and do not open for discussion of principles and lines.
- There does not seem to be an agreement in the industry that passive- or near-zero houses are the best solution.
- There is a lack of consistency between the different requirements, which makes it hard for the industry to plan ahead.

It might seem like the problem does not lay in the constant revision of the building regulations every few years, but rather that the direction one decided many years ago is unchangeable. The direction seems locked, and it seems like alternative analysis and alternative costs of each new update is unnecessary, because of the over-all tactical goal of near-zero houses.

The problem of not having a clear strategic goal might also a problem in other parts of today's climate policies. The debate is often at a lower policy level, typically measures and practices, and the over-all lines and principles are forgotten. This has also been the subject in the public debate lately, concerning for instance the marginal environmental advantages of private waste-sorting (Bjørnstad et al., 2015) and subsidies of electric

cars (Brandslet, 2014). The problems shown in this case study is in other words not unique.

In the same way that a project must be assessed and discussed in a strategic perspective, a policy should be discussed at a high level, often called principles or lines. This perspective is somewhat lacking in public reports, which again makes it harder to understand the purpose of the energy requirements in TEK10. Furthermore, this makes it hard to assess whether TEK10 is a successful policy or not.

When this is the case for a policy that the government explicitly has stated should be developed using a three-pillar sustainability, it is likely to be the case for other policies as well, both environmental policies and others.

6.2 Further research

This study barely scratched the surface on the large and multi-faced field that is sustainable policies and policy-making. Section 5.5 discussed some weaknesses with the performed case study and some alternative scopes. This section will elaborate further recommended research.

As this study concludes, alternative lines for TEK10 are not discussed in official reports, because the reports regard a different policy level. It would therefore be interesting and necessary to also study how Norway ended up with the goal of having near-zero houses in 2020. This would probably include a bigger timeframe, as well as international assessments, since the author suspects that this is largely influenced by international negotiations and agreements, see for example European Parliament, Council of the European Union (2010).

As seen in this report, the 'Instructions for Official Studies and Reports' are not always followed, and the impact assessments and alternative analysis are often poorly executed or even missing. Why does that happen? How does public policy making happen in Norway? This is an interesting and important field, and needs more research. A few of the informants in this study mentioned lobbyism as a significant factor in the policy-making process. The influence of different stakeholders is interesting, and may play a bog role in the final output. To which degree may lobbyism affect a rational policy-making process? How public policies come to life is a complex process, but essential to

understand in order to be able to influence policy-making. The mentioned garbage can-theory is as interesting as it is frightening, and may help explaining the chaos and randomness in which policies come to life.

There is also a need to discuss who should pay for environmental policies. Today, the buyer has to take the cost, even though saving energy is indeed of public interest. It is often the younger generation, the first time buyers, who has to pay the price. The people who already own property capitalize on this, since the market goes up. Should the cost be taken by the society as a whole?

The study only looked the environmental energy requirements, but much of the public debate concerning TEK10 regards other measures, such as universal design. It would be interesting to study how sustainability is taken in consideration in these policies as well, since the environmental pillar is not as obvious as it is in the energy requirements.

These are all questions and lines that this study has led to, and that needs to be answered in order to understand the complexity of sustainable public policy-making.

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8 Appendices

- A. Understanding the emergence of policies – revising building regulations in light of the three pillars of sustainability (Lunke et al., 2015)
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Appendix A Understanding the emergence of policies – revising building regulations in light of the three pillars of sustainability

Understanding the emergence of policies – revising building regulations in light of the three pillars of sustainability

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Abstract

The building regulations for the Norwegian construction industry (TEK10) undergo a major revision in 2015. This case study firstly examines to what degree social and economical consequences are taken in consideration when deciding energy (environmental) requirements in buildings. Secondly, it looks at the analysis and assessments that lay the basis for the decision of new requirements. The main research object of this paper is formal regulation of construction/housing in Norway. In addition to this documentation study, semi structured, open-ended, in-depth interviews with key actors were conducted. An extensive literature review forms the analytic background of the work. The economical and social consequences of new building requirements are significant. These are, however, found to be to a smaller degree taken in consideration than the environmental perspective. The energy requirements in TEK10 are currently being updated, and the case study will not take the final requirements in consideration. However, the suggested regulations are currently sent out for comment, and it is possible to do a study on this stage. Further research on the topic is needed in light of the final regulations. Higher requirements to energy use in buildings are expected to make houses more expensive, and therefore drive the housing market up. The literature study revealed surprisingly few building regulation policy studies are found. The limited number of such studies reveals a lack in the research literature, considering the implications they have.

Keywords: building policy; TEK10; three-pillar sustainability; energy requirements; building cost

1. Introduction

This paper reports a pilot case study of the energy requirements stated in the Norwegian *Regulations on technical requirements for building works* (TEK10), including proposed revisions. The regulations are the current valid framework for land-based construction, and therefore lay the main requirements as to how we build our houses and buildings. This includes all parts of the technical aspect of a building, from universal design to fire safety, and from construction safety to energy requirements. This paper will focus on the latter. This gives an opportunity to investigate whether the three-pillar model of sustainability is exposed when assessing policies, or if some pillars are emphasized more than others.

In 2012, the Norwegian government stated that “[s]ustainability should be a fundamental principle for all development in Norway and the rest of the world” (Ministry of Environment 2012, p. 8). The same document had the following goal for a climate-friendly building industry:

“Tighten the energy requirements in TEK to passive house level in 2015, and near-zero energy level in 2020. The government will later decide what will define the passive house and almost-zero level. The decision of these levels will be made based on socio-economics, matters of health, and the competence in the industry.” (Ministry of Environment 2012, p. 140) (Our translation).

In the opinion of the authors, this is a strategically bold and ambitious move, and a big step towards low-energy buildings. Whether this is wise could, however, be questioned. Even though buildings represents about one third of Norway’s land-based energy use, the CO₂ emissions is only 3 per cent of the country’s total emissions (Klimakur 2020 2010, p. 155). The main reason for the relatively low emissions is Norway’s large production and use of renewable energy made from hydropower.

TEK has been subject to major critique, both in the public debate and by building specialists. The increased insulation decreases the living space in a building. For apartments, this means a two per cent decrease in living space (Rattsø, 2015), but for a small house (200m²) it typically represents an eight per cent decrease (16 m²) (Nylund, 2011). In addition, the regulations have a direct cost in terms of more technical complex solutions. ‘The Building Cost Index’ shows an increase in building costs of 46.6 per cent between 2005 and 2015 for a single house (Statistics Norway, 2015). The suggested new requirements will have an additional cost around NOK 150.000 (approx. \$ 20.000)

for a 200m² house (Multiconsult, 2014). The energy requirements represent the largest extra cost as a result of stricter regulations in TEK10 (Rattsø 2015, p. 29). Hustad (2014) states the technical requirements as the main reason for a significant fall in the building of new houses in 2014.

The 'Instructions for Official Studies and Reports' (Ministry of Local Government and Modernisation, 2006) makes it mandatory to study financial, administrative and other significant consequences before deciding on a public investment or policy. This means that an impact assessment has to be carried out. In addition, the instructions state that alternative instruments also shall be assessed, i.e. an alternative analysis. The instructions has been subject to critique, because consequences to a small extent are being described and quantified, economical analysis are seldom executed, and alternatives are to a small extent made visible (Riksrevisjonen, 2013)p. 7). See also Aarseth (2014).

In order to understand how Norway came to the decision of moving towards passive houses, this paper examine how public policy-making emerges in Norway. The paper will not focus on the actual technical solutions, not whether or not today's goal are the right one, but rather the over-all strategic purpose of the policy. In this paper, TEK10 is used as a case in order to study how we develop policies to comply with a three-pillar sustainability.

The research questions are as followed:

- Have the energy goals in TEK10, including proposed revisions, been designed to comply with a three-pillar sustainability principle?
- To what extent has a sufficient alternative analysis been executed, as made mandatory in the 'Instructions for Official Studies and Reports'?
- To what extents have the economical and social consequences that the energy requirements in TEK10 entail been taken in consideration?

2. Method

This paper is based on a case study of the energy requirements in TEK10, in accordance with the principles outlined by Yin (2014). The study consists of a document study of official reports and analysis, review of relevant literature, as well as semi-structured, open-ended interviews. It aims to study whether three-pillar sustainability is present in the decision of public policies in Norway.

The document study includes analyses executed in connection to the 2015 energy requirements, as well as documents and reports regarding building regulations and energy requirements from the last five years. The reports stem either from the government, in form of white papers and official plans, or are reports and studies carried out by private consultants on behalf of the government.

The literature review is conducted in accordance to Blumberg (2014). The review regards the concept of sustainable policies and three-pillar sustainability. The literature has been found using online search engines such as BIBSYS Ask and Scopus, and central keywords include sustainability, building requirements, TEK10, policies, policy-making etc.

The informants were chosen in order to show existing perspectives on today's energy requirements. Three informants were picked because of expressed disappointment with TEK10 in the media. This includes one who works with heat pumps, and one who works within the HTAC-industry, and one who is the CEO of a network that gathers environmental-interested real estate developers. One informant from the heat-pump industry was picked based on advices from other informants. By doing this, this paper does not intend to reflect a balanced set of arguments from relevant stakeholders, but rather investigate whether there are arguments and views that are not well represented in official reports, and if so, why. Also notice that all the informants represent a certain line of business, and are therefore biased in questions regarding whether a technical solution is superior to another.

3. Theory

3.1 Sustainable policies

The understanding of the concept of sustainability varies. Adams (2006) suggests that the popularity of the term is linked to this diversity, because it can be used to cover very different ideas. So-called three-pillar sustainability has gained prevalence as a way of describing sustainability. This line of thinking is based on the understanding that the economy, environment and society all depend on each other. The economy exists within a society, which again exists within the boundaries of the environment. Further, the society will have impact on the environment, and they are therefore interdependent. One problem with some exponents of three-pillar models is that the permit for trade-

offs between the pillars (Gibson, 2006). This has led to the distinguishing of strong and weak sustainability, the latter referring to a situation where trade-offs have been made.

In addition to the three pillars-principle, Haavaldsen et al. (2014) emphasize the value of differencing three different perspectives when assessing a project; operational, tactical and strategic. These perspectives relate to different outcomes, respectively the project outputs, the goals and purposes. Consequently, a project may be deemed sustainable in one perspective, but completely unsustainable in another. Even though this is mainly used to describe projects, it is easily transferrable to policies. Actually, it is even more important to remember the strategic goal, the purpose, of a policy, since a policy eventually will lead to projects or other actions.

Pressman & Wildavsky (cited in Page, 2006) specifies policy as a mix of principles, lines, measures and activities. 'Principles' are described as "[...] general views about how the public affairs should be arranged or conducted" (p. 208), and may be compared to ideology. 'Lines' are not as broad as principles, and refer to strategies to regulate or deal with a particular topic. 'Measures' are "specific instruments that give effect to distinct policy lines". 'Practices' are the specific behaviour that executes the instruments from the measures. Lines, measures and practices can be related to three levels of assessing a policy; strategic, tactical and operational.

Literature shows that quantifiable values, typically the economic concerns, often overshadow other concerns such as the social and environmental (Ackerman and Heinzerling, 2002). The values that are difficult to quantify are easy to undetermined, or twist their significance into what fits your own opinion (Laedre et al., 2015). In TEK10, the quantifiable values are typically U-values, CO₂ emissions, the actual extra building cost etc. Values that are harder to quantify includes health-risk, possible impact on the housing market, and living comfort.

3.2 Energy requirements in TEK10

The current energy requirements with proposed revisions have their root in the white paper 'Norwegian Climate Policy' from the Ministry of Environment (2012). The requirements are in accordance with EUs directive of energy performance in buildings which also states near-zero emission buildings as a goal in 2020 (European Parliament, Council of the European Union, 2010). We consider this to be a tactical goal, and the measures used to fulfill the goal include thicker insulation, three layered windows and

airtight constructions. See TEK10 for detailed requirements (Ministry of Local Government and Modernisation, 2015a). In 2015, the energy requirements are to be updated. A suggestion was sent out for hearing on the 16th of February 2015. One much discussed matter in TEK10 is how one should calculate the energy use of a building. Today, the requirements regard the buildings calculated *need* for energy. This means, if one builds a house after the passive house standard, one can actually use as much energy as one wants, and the house is still “passive”. There is an ongoing debate whether this should be changed to how much energy the building *actually* uses. This will open for more flexible solutions, and incentives to save energy during the building’s lifetime. See Ministry of Local Government and Modernisation (2015b) for the complete suggestion for new requirements. These are only suggestions, and they will not necessarily pass the parliamentary deliberation. They do, however, illustrate which direction the government intends to steer the energy requirements.

As a basis for the new requirements, two reports were made. Rambøll (2013) gave their suggestion to new requirements, which did not include an overall consequence analysis. The report stated that it expected that “more extensive analyses should be the basis of the final requirements” (part 3, p. 81). Such extensive analysis was conducted with Multiconsult's (2014) impact assessment. The report includes an economic analysis, concluding that many of the measures are non-profitable, both in a public and a private perspective (p. 6). The total cost of the measure will most likely be NOK 1.6 billion (approx. \$ 200 million). This estimate, however, is explicitly uncertain.

Considering the magnitude of a measure like TEK10 would have been subject for the Quality Assurance scheme for major public investments in Norway (QA-scheme), if it was a public investment. The scheme includes two external reviews of an investment before it’s execution, and applies to all investments over 750 million NOK (NTNU Concept, n.d.). This does not apply to the energy requirements in TEK10, because they do not represent a public investment, because the buyer takes the cost in the end, not the government.

4. Findings

4.1 Document study

An extensive alternative analysis seems to be missing from official reports, meaning that other lines than the one leading to near-zero houses in 2020 are not discussed.

Following the Ministry of Local Government and Modernisation (2006), such a report should include a study of what alternative measures that could be executed.

Official documents seem to focus on two things; the possible saved energy, and possible cost, the first getting most attention. The social consequences, such as the fact that it may make it harder for young people to enter the market, are little discussed. The exception is health-issues, where problem with passive-houses, indoor climate and ventilation is to some degree discussed, concluding that there is a need for more knowledge on the field.

Ministry of Local Government and Regional Development (2012, p.11) states that the “building politics should be based on the principle of sustainability” (our translation), and emphasizes the principle of three-pillar sustainability. The social aspect includes “safety, indoor climate, quality, well-being, accessibility, and universal design”. Under the economy-pillar, the report states that value-creation, cost-efficiency, productivity, life-cycle costs and economics and should form a basis for sustainable development. The possible effects the cost would have on the building market in the long run are not an explicit criteria. However, the Ministry of Environment (2012) states that “[s]tricter energy requirements [may] lead to increased building costs. It is not possible to determine for sure the effect of this measure in 2020” (p. 199) (our translation). Other reports argue that new requirements will lead to innovation in the industry, and that the cost of new measures therefore will decline in the years to come.

On a higher policy level, the global, strategic perspective is not well communicated. The reports and white papers (e.g. Ministry of Local Government and Regional Development (2012)) usually state that buildings represent 40% of the country’s total energy use, but only a few per cent of the total emissions. Further, they fail to communicate why energy efficiency is still the right direction to head in a country like Norway. In light of this, what is the purpose of TEK10? The official documents simply do not answer the fundamental question whether we are moving in the right direction.

Another common argument is that “environmental investments in buildings are economically profitable”, see for instance Ministry of Local Government and Regional Development (2009). However, investments that are privately profitable would probably not need regulations in order to be executed. The reason for the investments not already being executed is typically explained by an industry that has yet to see the

possibilities lying in these solutions, see THEMA Consulting Group (2011). This may be true for some measures, such as moving from oil-fueled heating to other sources of heating, but it is not the case in other scenarios. The Norwegian government maintains that the new energy regulations in TEK will most likely *not* be economically profitable.

4.2 Interviews

When talking to the informants, it became clear that there are two distinct schools of thought when it comes to energy efficiency in buildings; one being passive house, and the other being heat pumps.

There exists a tendency among some of the respondents that they have little knowledge about the political process behind a policy. Still, they had their clear opinions about what different measures should be taken. When asked, the answer from one of the respondents was that dealing with the governments on policies like this is like “banging your head against a wall”, meaning; it seems impossible that a response to the hearing will have any real impact.

The respondents show disagreements with some aspects of the energy requirements in TEK. The main arguments against the regulations include:

- TEK10 only focuses on a limited amount of “tools” to cope with energy use in buildings: Insulation, airtight construction, more energy effective windows, and fewer thermal bridges (Ministry of Local Government and Modernisation 2015b, p. 13). Some informants this wanted the government to use a “bigger toolbox”, and use for instance ground-sourced heat pumps, which “provides a solution that also takes in consideration the indoor climate and over-all comfort”.
- “We are heading in the wrong direction”, says one informant who works in the heat-pump industry. “Passive houses are not the solution” partly because of the risk of making a suboptimal indoor-climate. One informant emphasized the consequence this might have in an office-space, and how much this could cost a company in form of lower productivity.
- “There is something fundamentally wrong by using electricity for heating buildings. It is of high-value, and for heating we could use almost anything”, says one of the informants. “It is a paradox that the Ministry of Petroleum and Energy has a goal of moving from oil and electricity to other energy resources, and at the same time the Ministry of Local Government and Modernisation makes it easier to use direct

electricity in buildings. It seems inconsistent”, talking of a suggested regulation that will make it easier to use direct electricity in buildings under 1000 m².

In sum, these responses show a disagreement with TEK10 as it is today. Also, they reflect a frustration with the political process behind the policy-making. The informants seem to believe that lobbyism plays a big role in the decision-making. “One must be naïve to think that lobbyism does not apply to the development of policies like this,” says one informant. “Some lines of business have the economy to hire external help. Lobbyism is a business on it’s own”.

5. Discussion

5.1 Three-pillar sustainability in TEK10

The government has explicitly stated that building requirements should be based on the concept of three-pillar sustainability. The reports on TEK10 seem to focus on the possible saved energy, and possible cost. However, while the possible long-term effects of saved energy are much discussed, the possible effects of increased cost are not. The requirements are meant to be revised every five years, and one should therefore see further than just each single revision. Norway already has a heated housing market,

Haavaldsen et al. (2014) emphasized the importance of distinguishing between strategic, tactical and operational perspectives when discussing sustainability. According to this model, there should be a clear strategic purpose behind the energy requirements in TEK. It might seem obvious that moving towards energy efficient buildings is the right move, but it should still be stated what is the strategic purpose of the requirements, especially when it is stated that “increased energy efficiency in buildings will have smaller effect on the emissions of climate gasses in Norway” (Ministry of Local Government and Regional Development 2012, p. 73). Norway’s goal with the energy efficiency is to reduce the total energy use significantly within 2020 (Ministry of Environment, 2012). What is the purpose of this goal? If the requirements exist in order to secure Norway’s energy supply in the future, or to reduce CO₂ emissions, or if they are results of international agreements, different actions may be taken. For example, if the goal is to move from fossil energy, bio fuel (e.g. a pellet-stove) may be a solution. However, this may increase the CO₂ emissions from each house, and electricity from renewable energy is a better solution if lower total CO₂ emissions are the goal. Torjman (2005) tells us that a public policy seeks to achieve a desired goal, and

that “policy development entails the selection of a destination or desired objective” (p. 4). The official white papers and reports do, however, seem to reflect the tactical level of the policy, and not the strategic level, that is, the purpose.

5.2 Alternative analysis

Alternative analysis and alternative cost seems to some degree to be missing from the official reports, even though the Ministry of Local Government and Modernisation (2006) makes an alternative analysis mandatory. The authors will, however, not consider this a breach of the instructions. The decided long-term goal does not open for widely different alternatives to be assessed when revising the requirements, because these alternatives would not comply with the goal of a near-zero level. This finding comply with the ones described by Hagevik and Bøgh (2012).

The Ministry of Local Government and Modernisation (2006) also makes it mandatory to look at significant consequences. The prices of each new measure are discussed, but the same problem emerges here as with the alternative analysis. The combined costs of the long term tactical plan; the possible significant consequences of having a near-zero level in 2020 is not quantified, because each revision of the regulations only regards a small step towards that goal.

The interviews show two schools of thought when it comes to energy efficiency in buildings; passive houses and heat pumps. The two solutions seem to rule each other out, i.e. if one has a passive house, one will have such a small demand for energy that it is unnecessary and too expensive to install a heat pump. And if you have a heat pump, you heat your house so efficient that it seems unnecessary and disproportionately expensive to upgrade the house to a passive house standard. This also complies to the relatively expensive heating method of district heating. This is paradox is somewhat backed by a report from Bygg21 (2014) that states that there is a need for a critical view on how the different environmental measures work together. According to Rattsø (2015), a thorough assessment of the regulations is needed to see if the considerations of well-being and energy justifies the development of costs. Such an assessment has yet to be conducted.

5.3 Economical and social consequences

Much of the critique towards TEK10 is directed at the possible effects the requirements may have on the housing market. One real-estate developer says that the costs might be

higher than what the government states, and that this is more than what one saves on the electrical bill. “This will affect the used building market, too [...] and in that way make it harder for young people to enter an already expensive market” (our translation) (Garathun, 2015). These effects seem to be taken in little consideration compared to the possible saved energy. An effect like this must be considered to fall under both the economical and the social pillar of the three-pillar model.

The informants describe a lack of consistency between the different requirements. This makes the policies unpredictable, and makes it harder for the industry to follow. For instance, today’s regulations require alternative heat source for buildings over 500 m². The new revisions suggests that this should to be changed to 1000 m², a matter that seems to be of great significance to certain industries since this has a huge impact on the heat-pump market etc. These are, however, relatively small measures, and the over-all goal concerning near-zero houses in 2020 is consistent. There seems to be an agreement that it is a good thing that the requirements comes bit by bit, so that the industry has time to adapt to new requirements. However, this might also seem represent a problem. The additional costs may seem low for each new requirement, only a couple of per cent of the total building cost, but when new requirements come every five years, the total increase in building cost over ten-to-twenty years will be significant. If one looks at the four levels of policy, described by Pressman and Wildavsky (1973), the official reports conducted in relation to the current revisions (Multiconsult, 2014; Rambøll, 2013) regard the measures and practices, but does not discuss the lines and principles behind the policy. The increased building cost will eventually have an impact on the market, driving the prices up. This is not quantified, nor problematized in the reports, even though this is where much of the critique has been directed.

There lies a paradox in saving energy for the sake of saving energy. Basic economical theory tells us that when a demand goes down, so does the price. When we are saving a lot of energy, the price of energy goes down, which in the end makes energy cheaper for all of us to buy, and we use more energy. Thanks to technical development, we always have new devices that require energy. This is discussed and problematized by Hustad (2015). There are reasons to believe that we use the technological inventions to increase our living standard, instead of actually saving energy. For instance, a heat pump can be inverted in the summer and provide cooling inside, and because it is energy effective, people might do this because they can afford it. In the end, the building may end up using as much energy as it did before the heat pump was installed, but the over all

comfort is better. This is not a problem on its own, if increased living standard was the goal with the energy-requirements. But it is not. The political expressed goal of regulations is, however, to save energy, *not* to improve life quality and comfort.

6. Conclusion

The energy requirements in TEK10 were chosen as the case in this study because three-pillar sustainability is a common aspect of environmental-policies. If the study shows that the three pillars are not balanced in the making of such a policy, this might well also be the case for other public policies.

The study shows some tendencies that might cause problems with today's energy requirements:

- The social consequences are to a smaller degree discussed in official reports than the environmental and economical. The reports often include an estimated cost, but what consequences this might have on the prices in the building market seems under-communicated, even though this is an argument that often is used against the requirements.
- Alternative measures seem to be little discussed. This is probably because the reports regards a lower level of policy, and do not open for discussion of principles and lines. As a result, the strategic purpose of the energy requirements is not clear in official reports, and the tactical and level is overrepresented.
- There does not seem to be an agreement in the industry that passive- or near-zero houses are the best solution.
- There is a lack of consistency between the different requirements, which makes it hard for the industry to plan ahead.

It might seem like the problem does not lay in the constant revision of the building regulations every few years, but rather that the direction one decided many years ago is unchangeable. The direction seems locked, and it seems like alternative analysis and alternative costs of each new update is unnecessary, because of the over all tactical goal of near-zero houses. The over-all environmental goal also seems to make possible social and economical matters secondary, even though there is unclear which impact the energy requirements has on the environment. This might also be a problem in other parts of today's climate policies. The debate is often at a lower policy level, typically measures and practices, and the over-all lines and principles are forgotten. In the same

way that a project must be assessed and discussed in a strategic perspective, a policy should be discussed at a high level, i.e. it's principles or lines.

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Appendix B Referat fra intervju med Katharina Bramslev

17.03.15

Intervju per telefon

Hva er Grønn Byggallianse og hvilken rolle har du hatt i utformingen av nye energikrav til TEK10?

Grønn Byggallianse er en organisasjon for byggeiere og byggforvaltere med miljøambisjoner. Organisasjonen teller i dag 46 medlemmer.

Bramslev var sekretær for Arnstad-utvalget i 2010. Satt også i referansegruppen oppnevnt av DiBK da Rambøll utarbeidet nye forslag til energikrav.

Grønn Byggallianse arbeider for øyeblikket med hørings svar til TEK.

Hvilke økonomiske og sosiale (samfunnsmessige) konsekvenser kan strengere energikrav føre med seg?

De aller fleste medlemmene hos Grønn Byggallianse bygger næringsbygg, så svaret dreier seg derfor om det. Situasjonen for næringsbygg er annerledes enn for bolig. GBAs medlemmer har lyst til å bidra til lavere utslipp, og ser kostnader i sammenheng med hva man får igjen. En investering på ett område kan føre til at man sparer penger et annet sted.

Tror du disse tiltakene bidrar til at vi sparer energi, eller til at man heller benytter muligheten til å bruke like mye energi som før, og heller tar ut utbyttet i form av høyere komfort?

Jeg tror de på lang sikt fører til at vi sparer energi. Det er mange av tiltakene i dag som ikke har noe direkte innvirkning på komfort.

Hvilken prosess har TEK vært igjennom når den blir vedtatt?

På oppdrag fra DiBK skrev Rambøll en rapport med forslag til nye energikrav. Under utarbeidelsen av rapporten oppnevnte også DiBK en referansegruppe bestående av ulike fagpersoner. Rapporten fra Rambøll ble sendt til DiBK, som brukte den som grunnlag for sitt forslag til departementet. Forslaget gikk deretter gjennom den politiske

kverna i departementet før det bunnet ut i høringsforslag. Høringsforslaget går så tilbake til næringen som kommer med innspill, før det ender i en endelig forskrift.

Hvordan stiller du/dere dere til høringsutkastet som nå er fremmet?

Vi er positive til enegikravene i nybygg. Vi er enige i at det bør være minimumskrav, men disse må også være fleksible.

Når det kommer til rehabilitering av eksisterende bygg er situasjonen en litt annen. Vi ønsker enten en egen forskrift for rehabilitering av bygg, eller en modell der levert energi brukes fremfor netto energibehov.

Hvilke ulemper/begrensninger ser dere ved TEK slik den er i dag?

Vi skulle ønsket et regelverk som også fanger opp eksisterende bygg. Vi ser også fordelene av å se mer helhetlig på miljøbelastningen, for eksempel slik det gjøres i BREEAM.

Appendix C Referat fra intervju med Randi Kalskin Ramstad

07.04.15, Trondheim

Hva jobber du med, og hvordan påvirker TEK ditt arbeid?

Jeg jobber med grunnvarme, altså energiløsningen i bygget. I gjeldende TEK er det krav om at bygg over 500 m² skal ha en annen varmekilde enn strøm. 60% av varmebehovet skal dekkes av noe annet. Det er i praksis et ganske strengt krav, og vil i praksis kreve biobrensel eller varmepumpeløsninger. Det er bra, for det billigste ville ellers vært å innstallere elkjel. Den nye tekniske forskriften legger dog opp til at denne grensen flyttes til 1000 m².

Og da vil de fleste velge elkjel på bygg som er under 1000 m²?

Mange vil nok det. Det er helt klart enklest og billigst å installere store elkjeler. Jeg har jobbet med grunnvarme siden 98, og det er dyre installasjoner. For at utbygger skal ta denne kostnaden trengs det enten gode støtteordninger og/eller krav. Det er fortsatt slik at en av de største barrierene er at man har et investeringsbudsjett og et driftsbudsjett, og derfor ikke ser verdien av lavere driftskostnader på lang sikt.

Men det er også slik at noen utbyggere er opptatt av å være miljøvennlige. Disse vil da ikke innstallere elkjeler. Dette kommer ofte som følge av at de ønsker å score høyt på andre sertifiseringsordninger, som for eksempel BREEAM. Men dette gjelder ikke majoriteten.

Er det lønnsomt over tid å velge alternative oppvarmingsløsninger?

I veldig mange tilfeller er det nok det ja. Kanskje ikke i de minste eneboliger, men i større bygg kan det fort lønne seg i lengden.

Som du sier koster det mye penger, og vi har fått stadig flere krav de siste tyve årene. Tror du vi sparer inn alle investeringene i lengden?

Det har jeg ikke forutsetning for å si noe om, og jeg vet ikke hvilke kostnader mer isolasjon medfører. Men det er klart, det går en grense. En optimalisering mellom isolasjon og tetthet på ene siden og valg av energiforsyning på andre siden. Hvor denne grensen går kan være forskjellig fra bygg til bygg.

Hva ville du endret med TEK i dag?

Som sagt, jeg vil ikke endre kravet til fornybar energi. De kunne godt vært videreført.

Men nå som bygg blir stadig tettere, og bedre isolert, er det ikke da greit å bruke strøm til den lille oppvarmingen som trengs?

I store bygg vil uansett behovet være betraktelig. Det er heller ikke noe reduksjon i varmtvannsbehovet, noe som er godt egnet å bruke varmepumpe til å varme opp.

Det som er grunnleggende feil er å bruke strøm til oppvarming. Strøm er høyverdig energi og bør brukes andre steder enn til oppvarming. Til varme kan vi bruke alt mulig annet. Det er det viktigste prinsippet for meg.

Det er vanskelig å spå utviklingen fremover. Strømprisene har vært lave i mange år, og det er ingen tvil om at kravet i gjeldende TEK har vært avgjørende for at folk har valgt andre løsninger enn elektrisk oppvarming. Men strømprisene vil ikke holde seg lave fremover. Kanskje i noen år, men ikke i overskuelig fremtid. Derfor er det rart å nå fire på disse kravene og tillate mer bruk av strøm, nå som bransjen er i ferd med å lære seg andre alternativer.

Noen vil argumentere for at vi uansett har så ren strøm i Norge, hva mener du om det?

Det stemmer ikke helt. Mye av vannkraften er solgt med opprinnelsesgaranti, og mye av strømmen som ikke har dette kan være kullkraft. Så det argumentet holder ikke.

Enova som jobber på oppdrag fra Olje og energidepartementet har som et av sine mål å fremme omlegging fra strøm/olje/gass til andre energikilder. Da er det rart at Kommunal og moderniseringsdepartementet og DiBK legger til rette for det motsatte. Det henger ikke helt på greip.

Kommer du/dere til å sende inn hørings svar angående TEK?

Ja, vi skal nok det. Men det er stor uenighet i bransjen for tiden, så det er vanskelig å si hva utfallet blir.

Regjeringen er veldig opptatt av forenkling, og da helst for utbygger.

Forskrifter som dette bør bygge på kunnskap, og da er det viktig at fagfolk sier i fra når de har en mening. Vi besitter kunnskap, og har derfor et ansvar. Dette kan mange fagfolk

bli flinkere på. Det balanserer debatten, og er den eneste måten politikere kan fatte et fornuftig vedtak. Slik det foregår i dag er det mye økonomi og kortsiktig tenking.

Hvordan foregår den politiske prosessen bak et forslag som dette?

Jeg vet ikke, men jeg tror det er mye lobbyvirksomhet. Det kan virke som om boligprodusenter og utbyggere er hørt mer enn andre i denne debatten, uten at jeg har grunnlag til å si så mye om det.

Multiconsult og Rambøll har nå utarbeidet to rapporter i forbindelse med de nye kravene, og to rapporter er jo ganske lite å fatte et så stort vedtak på.

Boligprisene går stadig opp. Tror du energikravene har mye å si for dette, eller er det andre faktorer som er mer gjeldende?

Jeg tror nok at isolasjon og materialbruk kan drive opp prisen, men det krav som universell utforming bidrar også. Noe som sannsynligvis driver kostnadene på boliger/bygg oppover er også kostnadsnivået for arbeidskraft, samt lav rente, og ikke nødvendigvis høye materialkostnader alene. Effektiviteten i byggenæringen har heller ikke økt, tror jeg.

Appendix D Referat fra intervju med Sturla Ingebrigtsen

07.04.15

Intervju per telefon

Hva jobber du med, og hvorfor er TEK viktig for deg og din bedrift?

Jeg er markedssjef for Systemair. Vi leverer ventilasjonsutstyr til alle type bygg, men det er leilighetsbygg og næringsbygg jeg har ansvaret for. TEK er viktig for oss blant annet fordi økt krav til tetthet i bygg stiller strengere krav til ventilasjon.

Hva er deres syn på de foreslåtte kravene i TEK?

Vi synes det er viktig at kravene blir skjerpet, og det er riktig at det strammes inn litt etter litt, for at vi skal nå målet om nesten nullhus i 2020. Vi er dog uenige i at fornybarbiten er foreslått fjernet, og her tror jeg det har vært mye lobbyvirksomhet. Strøm er en knapp ressurs, og derfor er det feil å fire på disse kravene.

Noen vil argumentere for at strømmen i Norge er “ren”, og at vi derfor kan bruke denne til oppvarming med god samvittighet. Hva tenker du om det?

Det stemmer at vi selv produserer “ren” energi, men samtidig selger vi mye av denne strømmen og importerer “skitten” strøm. Uansett hvor strømmen kommer fra, må vi være enige om at det er knapphet på strøm, og at denne derfor bør spares på. Å gå vekk fra krav om fornybarhet er derfor en bom.

Videre burde man stilt kravene ut i fra levert energi, fordi det er den energien vi faktisk bruker som har noe å si. Dette gir også insentiver til å spare mer.

Men etter som hus får stadig mer isolasjon og blir stadig tettere, så går jo energibehovet til oppvarming ned, og kan bli bare en brøkdel av hva det en gang var. Er det ikke da greit å bruke strøm til dette stadig minkende energibehovet?

Jo, forsåvidt. Og det er viktig å tenke økonomi i det hele. Se for eksempel på varmepumpe integrert i ventilasjon, det er en løsning som over hodet ikke er økonomisk bærekraftig, men det er blitt tvunget igjennom av politisk vilje.

Å fjerne fornybarkravet uten samtidig å sette en faktor på forbruk av strøm mener jeg er feil.

Mange har påstått at kostnaden ved alle nye miljøtiltak gjør boliger betraktelig dyrere, og at det derfor ikke er bærekraftig sett i et økonomisk perspektiv. Hva mener du om dette?

Ja, det stemmer at det blir litt dyrere. Men dette kommer blant annet som følge av at tekniske bytter ikke lenger er mulig.

Kan det også ha sammenheng med en bransje som er lite villig til å endre seg?

Ja, bransjen er konservativ. Se for eksempel på vindusleverandører, de mente det ville være umulig å levere gode nok vinduer da det kom nye krav, men i dag leverer de førsteklasses vinduer uten at prisen er gått nevneverdig opp. Det er mange "sannheter" i denne bransjen som ikke stemmer. Mange glemmer at virkeligheten har forandret seg mye de siste årene, spesielt hva gjelder tekniske løsninger.

Du nevnte tidligere at du mener lobbyvirksomhet har vært en faktor i prosessen som har ledet opp til forslag til nye energikrav. Tror du lobbyvirksomhet har en stor påvirkningskraft når reguleringer som dette skal på plass?

Ja, det tror jeg. Noen bransjer har råd til å kjøpe seg inn hos firmaer som driver lobbyvirksomhet. Noen kjenner noen som snakker med noen, det er slik det fungerer. Man er blåøyd og naiv om man ikke tror at lobbyvirksomhet påvirker det endelige forslaget.

Appendix E Referat fra intervju med Helge Skarphagen

09.04.15

Intervju per telefon

Hva jobber du med, og hva er din erfaring med TEK?

Jeg jobber med varmepumper, og er en sterk pådriver for grunnvarme. Da det ble skrevet utkast til TEK07 var jeg pådriver for at et alternativ med borehull og varmepumpe skulle utredes. Det ble ikke gjort, fordi direktoratet etter sigende ikke hadde bevilget midler til dette. Passivhus ble i stedet det langsiktige målet.

Og det er galt?

Ja. Jeg er overbevist om at borehull er en bedre løsning enn passivhus. Vi hadde vært bedre tjent med "aktivhus" enn dagens passivhusløsning. Passivhus legger store arkitektoniske begrensninger, og jeg tror rett og slett ikke folk ønsker å bo i disse husene.

Blir byggene mye dyrere som følge av kravet til økt isolasjon?

Ja, det er åpenbart. Tenk deg et passivhus formet som en kube, altså den vanlige, energieffektive utformingen av et passivhus. 10x10 meter i to etasjer. Den økte isolasjonen betyr et arealtap på 16 m² i dette bygget. Avhengig av hvilken kvadratmeterpris man legger til grunn gir dette forskjellige kostnader, men et nøkternt anslag er 20 000 per kvadrat. Det gir en merinvestering på 320 000 for et nybygg, noe som er vanskelig å forsvare økonomisk.

Du mener altså at vi er på vei i gal retning med TEK og et mål om passivhus og etter hvert nær nullhus?

Ja, helt opplagt.

Et annet scenario er kontorbygg. Hvis man her antar at man bruker 100 kWh/m²år, og antar i snitt 30 m² per ansatt og at 1 kWh koster 1 kr. Da har man 3000 kr i strømutfgifter per ansatt per år. Når vi da antar at hver ansatt har en lønn på en halv million, og arbeidsgiveravgift og andre utgifter en ansatt fører med seg, bruker man bare en brøkdel av et prosent av dette på strøm. En forsvinnende liten utgift. At man da skal bygge passivhus og risikere et suboptimalt inn klima er helt ulogisk, da dette vil føre til langt større tap i form av lavere produktivitet.

Det samme kan overføres til skoler. Byggene blir så tette og varme at man til slutt åpner et vindu. på våren fyker da pollen inn, og elever med allergi får ødelagt eksamen sin som følge av dårlig inneklima.

Se også på eksisterende bygg. Å endre et eksisterende bygg til passivhusstandard krever gigantiske omveltninger, og beboerene må flytte ut i en lang periode. En kjempeinvestering og så upraktisk at de færreste vil gjennomføre det. Da er det langt enklere å innstallere varmpumpe og borehull. Det vil heller ikke være til forstyrrelse for beboere. Jeg har selv gjort dette i mitt eget hus.

Passivhusfolket fokuserer kun på energibehov, og unngår å se helheten. De har en slunken verktøykasse, og bruker kun noen få virkemidler; tykkere vegger, mindre og færre vinduer og tre lags glass. Det finnes et helt arsenal av andre verktøy som ikke brukes. Vi må huske på inneklimaet og komforten i det hele, som har stor betydning.

Hvorfor tror du da politikerne har valgt denne retningen?

Tordenskjolds soldater! Det er de samme menneskene som gjennomfører vurderingene gang på gang, naturligvis med samme resultater. Det man *burde* gjort er å trekke inn god internasjonal kompetanse. Man skulle bevilget penger til å bygge to demonstrasjonsbygg, ett etter passivhusstandard og ett med borehull og varmpumpe. Et sammenlignende studie ville vist at man bør droppe passivhus.

Har du selv engasjert deg noe i debatten, ved å sende inn for eksempel høringsvar?

Nei, det har jeg rett og slett ikke tid til. Jeg har hatt litt med DiBK å gjøre, og det føles som å stange hodet i veggen. De henger langt etter, og begynner først i dag å se på løsninger som vi foreslo for ti år siden.