



Norwegian Tax Administration Building Decision Making Process

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Abstract

There exist very few outstanding examples of ambitious renovation projects in the non-residential sector in the world. The IEA SHC Task 47 studies the best demonstration projects in seven participating countries. In subtask B decision making processes are studied in particular in order to learn more about how the number of ambitious renovation projects may be increased.

This paper is about the decision making process in the most ambitious renovation project within the non-residential sector in Norway – the office building (35,000 m²) rented by the Norwegian Tax Administration in Oslo. The building is owned by Entra Eiendom AS. After renovation the building will comply with the Passive House standard, achieve the energy label A and be BREEAM certified as very good. The renovation started in August 2011 and is expected to be completed by October 2013. The paper discusses the drivers and barriers for increasing the ambition level regarding energy efficiency of the retrofitted building. The findings are based on personal interviews with the key actors involved. The interviews followed a common questionnaire template developed in the international project.

Some of the critical factors which influenced the decision making process were (poor and good) communication, attitudes of individuals, existing and new company policies and competition as driver for innovative solutions.

Keywords: retrofitting, renovation, non-residential buildings, decision making processes, market barriers, stakeholders.



Figure 1 Illustration of the building after renovation (LPO Arkitekter)

1. Introduction

This paper is about the decision making process in the most ambitious renovation project within the non-residential sector in Norway – the office building (35,000 m²) rented by the Norwegian Tax Administration in Oslo. The building is owned by Entra Eiendom AS. After renovation the building will comply with the Passive House standard, achieve the energy label A and be BREEAM certified as very good (it cannot reach excellent as the standard was not followed from the initial planning phase). The renovation started in August 2011 and is expected to be completed by October 2013.

The paper is a result of interviews during summer 2012 (midway in the renovation process) of these key actors:

- Norwegian Tax Administration as tenant
- Entra Eiendom AS as landlord
- Optimo Prosjekt AS as project manager
- AF Gruppen AS as contractor for structural works and coordination
- In addition the energy consultant Arne Førland-Larsen has contributed directly to the paper as co-author

The purpose was to learn how this project evolved from the initial idea to the final decision about how it is now renovated.

A second round of interviews with the same actors is planned for six months after the project is completed in order to learn more from experiences during the renovation phase and first use of the renovated premises.

2. Methodology

As part of the work in the international research project IEA SHC Task 47 [IEA SHC Task 47 2011], a common template for interviews of stakeholders in retrofitting projects was developed in line with existing theory about qualitative interviews [McNamara 1999]. This questionnaire was used as a guideline for all interviews in this case. All interviews were made by two of the authors of this paper and were taped in order to recall all details discussed. Two of the interviews were conducted with individuals and the other two were group interviews of two or more persons from the same organization.

The analysis of the results has been transformed into a common template made by researchers contributing to the IEA SHC Task 47 project. As this renovation project is not completed before October 2013, new interviews are planned for early next year with the same persons.

3. Facts about the project

3.1. Milestones

The following includes the milestones for the project:

- Initial idea launched: 01.09.2009
- First version of the project plan: 01.02.2010
- Kick off meeting (tenant and project group) launching idea of A/PH class: 14.09.2010
- Workshop with project group launching new environmental program and quality plan for A/PH class for the project group: 23.09.2010
- Process with tenant adjusting client brief: 22.10.2010–01.12.2010
- Contact Enova for possible funding: 20.12.2010
- Workshop with main tenant representative from various user groups, launching the idea of class A/PH: 11.01.2011
- Final version of the project plan: 01.03.2011
- Decision to start the project (as class A/PH): 01.03.2011
- Application for funding from Enova submitted: 15.03.2010
- Funding of ~70 Euro per m² granted from Enova: 04.05.2011
- Contract with main contractor: 01.06.2011
- Commence renovation: 01.08.2011
- Renovation project completed: 01.10.2013

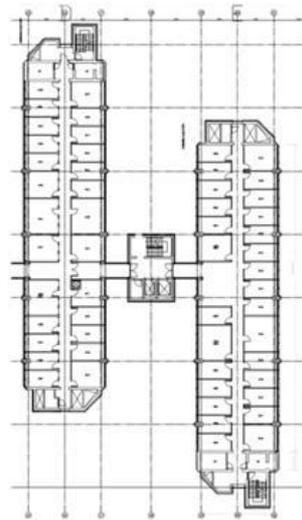
3.2. Technicalities in short

- Built: 1982
- Original architect: FS Platou
- Renovation architect: LPO Arkitekter
- NTA's employees in the building:
 - Before renovation ~ 860
 - After renovation ~ 1,060
 - Increase due to re-locating of other employees in Oslo
- Office building including in-house big data central and print shop:
 - Space before renovation 31,000 m²
 - Space after renovation 35,000 m²
 - To be leased by NTA after renovation 22,000 m²
- Energy use (including all energy use):
 - Measured before renovation 190 kWh/m²/year
 - First planned 129 kWh/m²/year
 - Final plan 89 kWh/m²/year
- After renovation about 30 % of the space will be rented out to other tenants.

The overall design strategy was based on:

- Optimizing the building envelope
- Optimizing the technical system
- Utilization/recovery of energy from data facility in the building

The increase of the space is a result of linking the original five building blocks together by building new intersections between them and replacing the gateway bridges which previously linked them together. This concept means increased space and simultaneously reduced outer facade per m², which is very energy efficient.



Typical floor plan before renovation



Typical floor plan after renovation

Figure 2 Illustration of the layout before and after renovation of the building (LPO Arkitekter)

Improving measures for the building envelope:

	Before	After
Roof/attic	~ 0.2 – 1.0 (average 0.5)	0.12
Floor/slab	~ 0.1	0.1
Walls	~ 0.2 – 0.4	0.17
Ceilings	~ 0.3	0.12
Windows	~ 1.8	0.72
Airtightness	~ 3.0	<0.6

Table 1 U-values before and after renovation.

Improving measures for the technical system

Heating system

- Before – Electrical heating
- After – Water-based heating systems

Ventilation

- Before – CAV mechanical ventilation

- After – VAV mechanical ventilation, design maximum average air flow is $7 \text{ m}^3/\text{m}^2 \text{ h}$ for the entire building.
- Low SFP < 1.5 , and efficiency of heat recovery $> 85 \%$ (SFP and heat recovery for average design air flow: $7 \text{ m}^3/\text{m}^2 \text{ h}$).

Hot water

- Before – Central electrical heated boiler
- After – Central boiler heated with waste energy from data facility in basement in combination with electricity/district heating

Renewable energy systems

- Before – None, all energy consumption was based on electrical supply
- After – Reuse of waste energy from data facilities in basement in combination with district heating from public supply. Night cooling strategy for reduced cooling (Førland-Larsen, 2012)

The facades are made of 85 % recycled aluminum. The technical descriptions are more elaborated in a documentation made in IEA SHC 47 Subtask A [Førland-Larsen 2012].

During the renovation the tenant had to move its employees to temporary buildings in another area in Oslo, except from the data central which remained in the building (basement) during the renovation. This relocation was taken care of by the landlord.

4. The main actors

4.1 The Norwegian Tax Administration

The Norwegian Tax Administration (NTA) is the tenant of the building and has been strongly involved throughout the whole process of this project. Its main activity is to administrate the Norwegian tax system. In the same building, the body also operates an in-house computer center and a print shop. The latter activities also include services for other public bodies. The organization has employees located in about 170 buildings throughout the whole country.

NTA is a member of a national project called “Green State Project”. As part of this they also keep account of their CO₂ emissions. After two years, this shows that a third of their emissions are from their buildings (nationally). Another third is from transport of employees between their homes and their job location. The last third includes printing, internal travels (between locations), etc. As a standard, NTA requires the buildings of any new lease contracts to meet the label B requirements.

Key persons in NTA for this project:

Director of the real estate department, Erik Braun, was the project owner on behalf of the tenant. He is a building engineer and has 25 years of experience from different sides – as a contractor, a consultant and landlord – in the building industry before he started working for NTA.

Tor Steinsland has been working for NTA for the last 26 years with IT. He is very dedicated to environmental issues. He has therefore been a person who has advocated increased ambitions for the project.

Svein Riise works with development, competence development and project management for the IT department.

Top management involved:

Managing director Svein Kristensen is an economist and has been working in NTA since 1996 and as managing director since 2006.

Inga Bolstad has studied law and management and has worked in NTA since 2000 as IT director since 2007. She has a strong focus on CSR (Corporate Social Responsibility), and maintained close contact with the project owner during the decision making process.

4.2 Entra Eiendom AS

Entra Eiendom AS (Entra) is a professional landlord of non-residential buildings. It is a private limited company but owned 100% by the Norwegian state.

Key financial figures (in NOK 1,000):

	2011	2010	2009
Profit & loss			
Revenues	1 467,8	1 501,8	1 774,9
Profit before tax	805,6	947,1	1 037,5
Balance			
Equity ratio	31,1 %	31,3 %	30,6 %
Total equity	7 391,4	6 952,4	6 608,7
Total liabilities and equity	23 740,3	22 225,6	21 343,4

* NOK 1 = EUR 0.136, USD 0.166 (03.08.12)

Entra's business concept is to add value by developing, leasing and operating attractive and environmentally friendly premises.

A short time after signing the lease contract (for a class B building), Entra concluded "an Environmental strategy" which stated that the company should be the leader in development of sustainable buildings in Norway.

Key persons in Entra for this project:

Director of projects and development Bjørn Holm is an engineer in building and construction. He has previously worked as CEO of a construction company and before that as project leader. He has worked for Entra for eight years.

Market director Anders Solaas holds a Master's in business and economics. He has previous experience as CEO of a real estate company and as financial manager. He has been employed in Entra for the last 12 years.

Managing director Kyrre Olaf Johansen (until April 2012) is an engineer and has previously been CEO in road construction companies. He was the manager of Entra for four years. He played an important role particularly in the latter part of the decision making process.

4.3 Optimo Prosjekt AS (OP)

This company was a part of Entra until 2010. The managing director Bjørn Grepperud is now the

majority owner of OP. The company's mission is to offer project planning and management, and construction site management.

Assignments for Entra count for more than half of the company's activities which consist of project management, project planning and building site management.

The company also energy certifies other companies. OP previously had no experience with BREEAM or passive houses before this project. However, the company has experience from upgrading three buildings in order to reach the energy label B.

Key financial figures (in NOK 1,000):

Profit & loss	2011
Revenues:	78.311
Profit before tax	4.016
Balance	
Equity ratio	26 %
Total equity	13.876
Total liabilities and equity	53.218

* NOK 1 = EUR 0.136, USD 0.166 (03.08.12)

Key person in OP for this project:

Managing director Bjørn Grepperud was responsible for the planning and management of this project. He is a building engineer and economist. He has previously worked for other big Norwegian building consultancy companies and for a construction company. For the last eleven years he has worked in OP and for Entra.

4.4 AF Gruppen Norge AS (AF)

AF is a publicly listed company. This project was carried out by the company's division for renovation projects.

The general mission of the company (group) is: We clean up from the past (includes strong focus on sustainability) and build for the future (focus on efficient use of materials and use of renewable energy).

The company does not have a special strategy for energy efficiency. Their philosophy is to adapt to customer specifications, but actively promote better solutions they have experienced before (which happened in this case).

This is the first project in which AF has used BREEAM in a renovation project. However, this has not changed the way they planned to operate the project. Now, several employees are being trained and will be certified in BREEAM.

The company is not ISO-certified, but has its own QA system. This system is now being adapted partly to BREEAM.

The company has no previous experience with retrofitting with energy efficiency ambitions. However, the experiences from a project in Kristiansand (Kilden) using prefabricated wall elements were extremely relevant for this project.

Key persons in AF for this project:

The project director Philip van de Velde was responsible for the project on behalf of the contractor. He is a Dutch building engineer. He has many years' experience as a project manager for larger contractors with projects in the Holland (where there was already a strong focus on sustainability in

buildings), Portugal, and in the Middle East. He has worked for AF for the last six years.

Tommy Simenstad was the project manager for AF. He is a master carpenter. Previously he ran his own company as contractor of smaller buildings. For the last six years he has been working for AF.

4.5 Other important actors

Enova is a state-owned enterprise that works to trigger energy efficiency measures and renewable energy production. In this project, Enova gave investment support to the measures that was necessary to bring the project to the Norwegian passive house level.

Katharina Bramslev, from the company Hembra, was the environmental coordinator for the project, and is an Approved BREEAM Professional. She has a long experience in green building design, is one of the leading people in the Norwegian Green Building Alliance, and has been involved in a number of pioneering building projects in Norway.

Arne Førland-Larsen from EnergeticaDesign was the energy consultant for the project. He has extensive experience in green building design and is working as a consultant for the Norwegian Green Building Alliance. Førland-Larsen has been involved in a number of pioneering building projects in Norway.

5. The decision making process

In this chapter we will look at each of the major decisions which were made by the different actors involved. The final result is a consequence of the sum of these decisions.

5.1 Expiration of existing contract

The landlord contacted the tenant for discussion of terms for prolonging the existing contract.

NTA rejected this proposal as they wanted to check the market for options. Reasons for this were:

- Big contracts should be won through tendering processes
- The occupants were not satisfied with the indoor comfort of the existing buildings
- They wished to have more space-efficient premises, i.e. less m² per employee

NTA established a project group comprising people from the IT department, the real estate department, and from the consulting company OPAK. With additional assistance from the architect company Mellomrom, the description of the request was made.

The general terms for NTA to enter new lease contracts requested a B class building.

5.2 Entra's reaction to the tender

Due to the size of the building, it was extremely important for Entra to win this competition. The company would face a challenge to make the existing building attractive for a new tenant with a similar need for space. It is questionable whether Entra would take on the risk to upgrade the building to such a high standard without having signed a contract with a new solid tenant.

Entra concluded that they had to come up with something innovative. Therefore three architects were hired to work independently to come up with some innovative suggestions. The architects were not given any special requests regarding energy efficiency. However, this issue was an important

part of the recommended solution from the architects. The solution was to link the five building blocks together with new sections between them and replace the gateway bridges which previously linked them together. This gave some important advantages:

- Increased space and simultaneously reduced outer facade per m², which of course is very energy efficient. However, they faced a challenge in achieving sufficient daylight in office areas facing the new enclosed volume.
- Better interactions between different departments of NTA due to easier access between the blocks.
- New possibilities for new layout of the premises which resulted in more efficient use of the space (reduced m² per employee).

In addition to this, Entra also found a solution as how to let the data central remain in the building during the renovation. Relocating the data central would have been very costly. If this has to be moved to a temporarily location and back again, this would be quite a disadvantage compared with the competing offers. By letting it remain in the building this was switched to a competitive advantage.

Another big challenge was how to deal with NTA's approximately 860 employees during the renovation process. It was discussed whether they could be relocated internally between the five blocks during the construction process as NTA leased about 70 % of the building, but this was not a realistic solution as there would also have been very intense work taking place between the blocks.

It was therefore concluded that they would have to include relocation to temporary premises for two years as part of the package. Entra offered NTA to move into newly renovated offices with a very attractive location.

5.3 NTA's evaluation of the offers

NTA received in total 17 offers for rent of locations. After some evaluations of the offers, there remained three very good solutions for NTA.

Based on a set of selection criteria such as price, effective layout, i.e. number of m² per employee, good working conditions for all categories of employees (including print shop and data central), access to public transport, extremely high security level for access to the building, NTA's image as regards the environment/sustainability, and modesty in expenditures, they finally chose the offer from the existing landlord.

5.4 Entra suggests A label/PH building

Two important initiatives entered the process after the contract for a label B building was closed between the two parties: 1. Entra's board concluded a new strategy to be a leader within energy efficient buildings; and 2. the energy consultants advocated strongly that the building could be upgraded to the Passive House standard and achieve the energy label A.

Such a solution would also result in a grant from Enova, the Norwegian energy efficiency body, which would cover about half of the additional costs for increasing the ambition level.

The management in Entra launched this idea for NTA and argued that this would give them a better building and stronger image.

5.5 NTA rejects and later accepts it

NTA was very concerned that this change would bring a negative impact on indoor comfort. They had several critical questions regarding the consequences of changing the plans. This also included a possible delay in progress of the project and the fact that they already had put much effort into developing the B label building. The first answers were not enough to convince NTA that this was a good solution. As a consequence, they rejected the proposal.

Entra prepared a consequence analysis of moving from a B class building to PH/A class building. After Entra had presented the consequence analysis, NTA's new project manager Arne Norrrud from Uniconsult played an important role to turn the skepticism in NTA into a positive conclusion. This process involved the top management of NTA, which supported the idea due to the expected positive image-building of the organization. Furthermore, it was used as an argument that Enova (the Norwegian energy efficiency body) had already expressed that they would support the project. In the discussions, the focus was on the fact that this could be an outstanding reference project not only for NTA but probably even more so for Entra.

NTA finally accepted the proposal of upgrading the building to an energy class A and Passive House standard. However, they were not willing to discuss increased rent compared to the already signed contract. After convincing NTA to opt for class A/PH, the different organization of NTA had to be convinced as well. Their concerns were primarily that the A/PH class would violate good indoor climate – and the impact would be indoor temperatures that were too low in winter periods and too high in summer periods. In order to demonstrate this, a meeting was set up with representatives from different groups in the organization: an architect, an energy consultant, and other members from the project group. The topics for the meeting were the architectural visions and contexts of the project and the indoor climate in the new building (air quality, thermal indoor climate, daylight, etc.). In order to make it more understandable, a simulation of indoor climate in the existing building was presented together with indoor climate compared with the refurbished building.

5.6 Entra goes for A-label/PH building

The response from NTA was not what Entra had hoped for; however, they seriously discussed if it was possible to take on the additional costs on their own expense. Many would argue that it is commercially wrong to let the tenant benefit from lower energy costs without paying for it. However Entra accepted this as they saw more benefits than the reduced profit from this conclusion. Important arguments for this decision were: image, i.e. it would look strange after completion that an actor was claiming to be “a leader in energy efficient buildings”; no higher ambitions than a class B for such an important building. The investment will last far beyond the period of the new contract, meaning that they now will get an attractive building to let also in the future. As they increase the area of the building, about 30 % of it will be rented out to other tenants. They should expect some higher rent for this area. The grant from Enova was also important for the conclusion. In addition to the financial aspect, it was also considered as prestigious that Enova confirmed this as a very good demonstration project.

5.7 Tendering process to contractors

When the final conclusion was reached, Entra started a tender process based on renovation to class A/PH. In order to keep a tight time schedule it was decided to split the project into three parallel contracts: 1. main construction (structural), which was won by AF Gruppen ASA (AF); 2. technical, which was won by YIT; and 3. interior, which was finally decided to be managed as a separate task by the landlord's representatives.

5.8 AF's efforts to win the contract

The contractor AF Gruppen considered how they could best develop a competitive offer. As the blocks are quite tall and large, they saw it as a huge challenge to secure a dry building. The costs of mounting a “tent” over the building would be very expensive. They concluded that they could take advantage of experiences from another project in Kristiansand where they built a big culture center (not PH standard) by using prefabricated wall elements of wood. The key person in the subcontractor which manufactured these elements had previous experience from a PH project using prefabricated elements. Their offer was therefore to develop a similar concept.

The approach presented to Entra was different from the other offers. AF made a movie to illustrate their concept and the advantages of it. Entra concluded that this was the most competitive offer and contracted AF for the biggest contract which included dismantling the old outer facade and roof and replacing these with new elements, furthering the construction of a new area between the existing blocks, as well as the overall responsibility for Health, Safety and Environment for the project.

6. Lessons learned

6.1 Introduction

This project focused from the very beginning on energy use as NTA requested a B label building in the tender. This was a consequence of the organization's procurement policy which specified this claim for new lease contracts.

The most interesting point in this case was how and why it turned out to be even more ambitious regarding energy efficiency.

6.2 Important drivers

The following were the most important drivers for increasing the ambition level of the project:

- There was already a focus on energy efficiency from the tenant's side
- Entra's new strategy to become the industry leader in environmental efficiency
- The energy consultant advocated strongly that it was feasible and sustainable to renovate to Passive house standard
- The project leader hired by NTA believed in the idea and convinced the landlord that the proposed solution would be good
- One of the key persons at NTA was very enthusiastic about the idea and was an internal promoter of increased ambitions
- Enova's grant was the final argument (but not decisive) for concluding the proposed alternative. Enova's support encouraged the decision makers to see this as a prestigious and sustainable visionary project
- The top management in both NTA and Entra saw that the project would support their respective organizations' social responsibility and thereby strengthen their image

6.3 Important barriers

There were some barriers which could have altered this project:

- The need to relocate to temporary offices was a big disadvantage. If it would have been necessary to also relocate the data central, it is likely that NTA would have chosen another landlord. It is also an important question for Entra whether they then would have been able to renovate the building to such a high standard.

- Lack of knowledge on the tenant's part in combination with imprecise information from the landlord and consultants regarding the consequences of increasing the energy standard of the building. The tenant expected that the indoor comfort would be poorer with the chosen solution. In particular, they worried about long delays in adjusting the indoor temperature.
- NTA could not accept an increased rent. As a public body they focused on efficient use of the tax payers' money. It would also be a deviation from the tender.
- The tight time schedule made it difficult to consider the consequences of the new proposal. But due to intensive work by the consultants and the increased involvement of the top management this barrier was overcome.

6.4 Main conclusions

Some factors may be both a driver and a barrier depending on how they are dealt with. One is communication which is extremely important in such projects. Due to imprecise information, the idea of increasing the energy standard was first rejected. When better documentation was presented the conclusion was changed. An example of good communication is how AF developed a movie to sell the innovative idea of using prefabricated elements instead of traditional on site renovation.

Due to the extensive construction work in the existing building, it would be more convenient for the occupants to move directly to new premises. But as a solution was found for the data central, this disadvantage was turned into an advantage.

The final result of this renovation project will be looked at as visionary and innovative. This is mainly a consequence of:

- a) Companies challenged by competition. First represented by Entra to search for new approaches to solutions for the tenant. Later represented by AF which launched the idea of using prefabricated elements.
- b) Company policies which expressed ambitions regarding energy and sustainability.
- c) Individual persons combining their skills and enthusiasm to convince others to increase the level of ambition.
- d) The increased public focus on sustainability has influenced this indirectly through the involved persons and the company policies.

The project team responsible on behalf of the tenant summarizes the conditions for accepting the same standard for their next project as follows:

- The rent may not be significantly higher than an energy label B building
- More landlords to offer PH buildings (need to have competing offers)
- Reduction in the number of cellular offices in order to reduce the number of total m² to rent

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