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9 **Down by the Fjord: Successful public and private collaboration in a Neighbourhood**

10 **redevelopment project**

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18 **Abstract**

19 The purpose of this paper is to investigate and study the green procurement processes in the
20 new and ongoing neighbourhood-building project named 'Fjordbyen' in Norway. The purpose
21 behind this study is to look at how Fjordbyen approached these processes in order to
22 contribute to the pool of knowledge on this topic. The Fjordbyen project is located on the
23 shoreline in the Drammen Fjord and represents in effect the development of a new
24 neighbourhood. This new development aims to settle at least 16,000 new residents and
25 16,600 jobs in a zero-emissions urban area that is green and future-oriented.

26 The topic has been addressed by using a case study approach. The data for this paper is
27 collected through a combination of desk research, a study of secondary data such as
28 documents studies (reports, documents from websites etc.), two Citizen Surveys and four
29 interviews with the key person involved in the front-end planning process of the Fjordbyen
30 project. It will build on Public People Private Partnerships (PPPP) literature, theory related to

31 stakeholder management and participatory process as well as theory related to organizing of
32 the front-end of urban redevelopment projects and green public procurement.

33 The study found that to a large extent the procurement processes in the development of
34 Fjordbyen were conducted with green considerations in mind from its early stages. Through
35 a combination of urban planning and typographical considerations, green procurement was
36 conducted in the context of ensuring that not just greener products were purchased, but also
37 green supply chains were managed as were the 'grass roots' development processes
38 themselves.

39 The finding of this study has an impact on the consideration of processes leading towards
40 green procurement in urban and city development projects. This is particularly the case with
41 regards to pushing even further research on the value and challenges associated with green
42 procurement processes. The finding of this paper will not just be relevant to the project
43 management field, but also procurement studies, urban planning, and industrial economics.

44 *Keywords*

45 Town and city planning, project management, procurement, built environment, sustainability

46 1. Introduction

47 With the emergence of the so-called 'Green Shift', a reappraisal of existing business practices
48 in many industries are an essential action to occur in parallel with this shift. From green
49 buildings to greener supply chains, to greener facilities management (FM), traditional
50 business and infrastructural practices whilst maintaining the same core intent, may require a
51 baseline reimagining to face the challenge presented by a world where sustainable credibility
52 is increasingly important.

53 In this study, we investigate how green procurement practices were managed in the
54 development of the new neighbourhood of 'Fjordbyen' in the municipality of Lier near
55 Drammen in Norway. The focus of the investigation has been as to how green procurement
56 has played an important and specific role in the front end of a large green development
57 project. More specifically, this study looks at the participatory challenges involved as well as
58 how green procurement was used as a front-end tool benefited the devolvement of the
59 project overall. In terms of a statement of need for the commencement of this research, the
60 development of Fjordbyen as an entirely new neighborhood offers opportunities to study
61 green procurement as a case study. There is little to suggest in existing research that a study
62 of this kind has been conducted before. The motivation for this study is to fill the knowledge
63 gap in this area and provide scope to improve upon green procurement processes in future
64 urban development projects in smart cities.

65 This paper will address the following research questions:

66 RQ1: What are the relevant decision making processes and mechanisms in smart and
67 sustainable urban development?

68 RQ2: What were the green procurement processes and mechanisms in the development of a
69 brownfield¹ area into a new green neighborhood?

70

71 Through a combination of desk research, document analysis and interviews with the
72 developers of the front-end planning process this paper will address the research questions
73 by looking into the data available and discuss how the green procurement process was

¹ Brownfield land is **land in a town or city where houses or factories have been built in the past, but which is not being used at the present time.**

74 executed and what kind of effect it had on the result that came out of the planning stage.,
75 before moving on addressing the research questions in turn before concluding.

76 In the following section, we will address the methodological approach to the study.

77 2. Methodology

78 The paper consists primarily of a case study approach using three different sets of data –
79 documentation from the project (bid documents, start-up seminar BREEAM documentation
80 etc.) that can be consider as secondary data, qualitative interviews, that is our primary data
81 and supporting desk research. This paper also consists of secondary documentation in the
82 form of green procurement documentation supplied by the PPPP company connected to the
83 project, Eidos. This provides an insight into both the narrative and more literal aspects of the
84 procurement processes.

85 Our primary data was collected in two rounds of semi structured interviews from staff at Eidos
86 and related stakeholders (such as concept stages architects) on the narrative behind the
87 development of Fjordbyen as well as the challenges and opportunities presented by the
88 citizen participation processes and the project more broadly.

89 In the first round of interviews, four interviews were conducted in total (three individual, one
90 group interview) with six individuals in total. Four of the interviews were with Eidos staff, one
91 was with an architect related to the early stage of the project and one member of staff related
92 to the municipality. These individuals were chosen to be interviewed due to their level of
93 expertise combined with their accessibility concerning the project the authors are affiliated
94 to. The interviews were ranged from 45 minutes to an hour in length. At least two or
95 researcher where present in all the interviews and the Interview data was notated through a
96 combination of transcripts and memo-based notes.

97 The second round of interviews was held in the form of a single session workshop consisting
98 of 2 personnel from Eidos and Lier Kommune. The format for these interviews was held in
99 the form of a *'workshop'* where the process was held more in the form of an informal
100 conversation, however, the researchers had prepared guidance notes to ensure the topics
101 were appropriately addressed. The workshop was held digitally due to Covid-19 restrictions
102 in January 2022. Throughout the 4-hour group interview, the topic focused specifically on
103 green-related procurement processes conducted within the project. More specifically this
104 related to tendering, team employment practices, supply chains the inclusion of BREEAM
105 certification methodologies in the front-end planning stage. The age and focus on BREEAM in
106 the front end planning stage of the Fjordbyen project gave access to a well-known
107 benchmarks tool and also gave us access to how Fjordbyens green elements had been
108 developed over the planning stage to strengthen the nuances of the narrative. Eidos supplied
109 a plethora of supplementary documents that provided figures and deepened the detail of the
110 procurement, certification and tendering processes that they had employed to get the right
111 green consultant team in place. This second round of interviews also resulted in a degree of
112 extra literature research to accommodate the overall reorientating of the project after the
113 latest set of data collection.

114 The documentation for this paper comes in two different forms, academic literature used to
115 support the studies' theoretical framework, and documents on green procurement and
116 related processes from the PPPP themselves.

117 Theoretical literature was sourced primarily from journals found on Scopus and other
118 respected repositories of scientific papers. The search terms of *'green procurement'*, *'green
119 procurement urban development'*, *'Green Procurement PPPP'* and *'procurement PPPP'* were

120 primarily used and trimmed when the search produced amounts of literature considered to
121 be superfluous to use.

122 The theoretical framework from this paper was developed to provide a contextual spine to
123 the overall research and a lens for definition clarity.

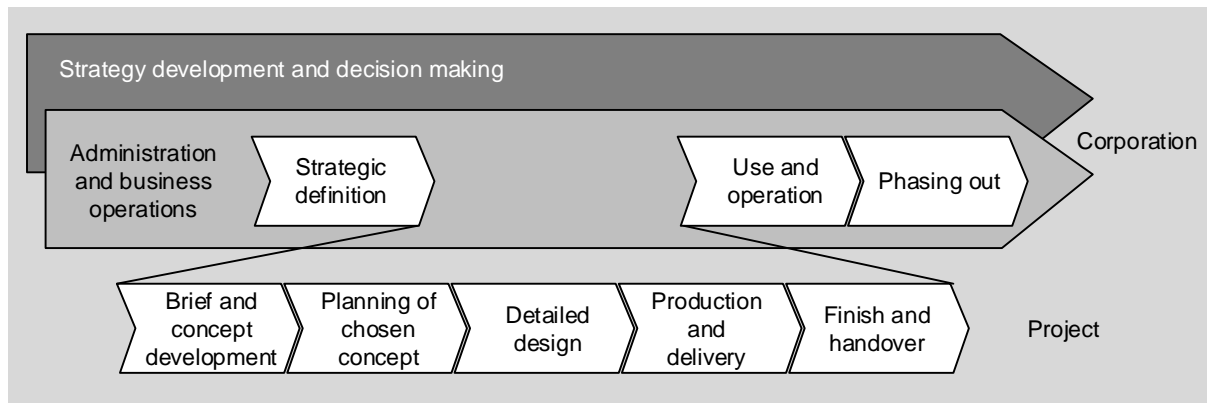
124 In the following section, we will describe the theoretical supporting structure of this paper
125 and related frameworks.

126 3. Theory – on Project and Procurement Models

127 This section will outline not just the theoretical supporting structural aspects of the paper,
128 but also frameworks related to this that provide a contextual basis going forward.

129 3.1 Project ownership

130 Ahola et al. (2014) claim there is no universal definition of project ownership, that there is a
131 large variation in the terminology used to define and describe the key concepts of project
132 ownership. Johansen et al (2019) say that the owner role may take part in four different
133 elements: Asset owner, PEO (Project Executive Officer that deals with the organization
134 processes and methods), sponsor (that pay for one or several stages of the development and
135 user (in the role facility managers of the building). The *asset owner* is the part of the owner's
136 organization that is responsible for the business case. The *sponsor* is the person or
137 organization that is funding the project; Samset (2003) uses the term *financing party*. The *PEO*
138 is a representative from the owner's organization who acts as a point of contact to the project
139 organization executing the work. The PEO is responsible for the project goals and secures
140 project governance on behalf of the owner.



141

142

Figure 1 Relationship between corporation and project (Klakegg, 2017).

143

Martinsuo et al (2019) say that the project's potential to deliver value over its lifecycle is

144

significantly influenced by the activities and decisions at the project front end. The project

145

front end is a strategically important phase that influences project success: it is where the

146

project owner (investor) must form a clear idea of its goals for the project and identify the

147

necessary partners for the project delivery. The project front end offers potential for

148

innovation and planning that can optimize value creation and the understanding of

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stakeholders' needs (Kolltveit and Grønhaug, 2004) and customers' expectations (Brady et al.,

150

2005) are considered as especially important at the project front end. Several issues require

151

decisions at the project front end, such as stakeholders' needs and requirements, technology

152

and design, policy and strategy, finance and commercial agreements (Edkins et al., 2013).

153

Such decisions fall into two main areas at the project front end: whether to invest in a specific

154

project proposal (Williams and Samset, 2010; Laursen and Svejvig, 2016) and the design and

155

definition of the project's goals, objectives and expected value of projects (Williams and

156

Samset, 2010). To address a variety of stakeholder perspectives and gain support for funding

157

decisions, the strategic framing must be wide enough to encompass the complex nature of

158

transport infrastructure investments (Salet et al., 2013). Even though Martinsuo et al focus

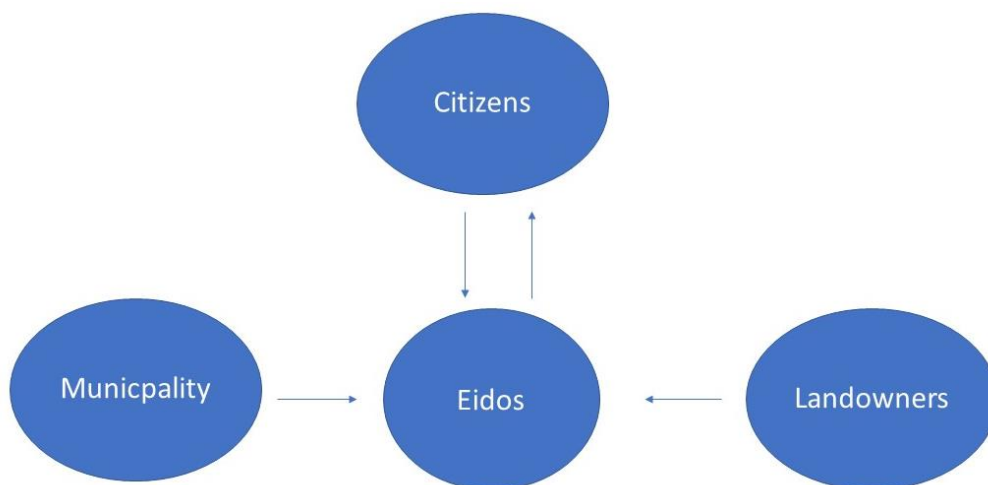
159 was on the transport infrastructure project – can it be argued that this element is highly
160 relevant for the development of a green/blue area as Fjordbyen as well.

161 3.2 Public People Private Partnership (PPPP) in the Early Phase

162 Public People Private Partnerships (PPPP) are becoming an increasingly core part of the
163 development of new strategies and companies that combine the interests of both the private
164 and public sector, whilst considering citizens and vital stakeholders. In terms of a more
165 specific definition, '*Public*' refers primarily to government departments, '*Private*' means
166 organisations that accrue a profit, and '*People*' are the citizens (Xue et al., 2020). An
167 advantage of this approach compared to others is that both the private and public sectors can
168 share the risks and responsibilities of a project with common governance and decision-making
169 structure between both sectors (Ahmed et al., 2006). When it comes to connecting PPPP's to
170 green procurement, this is a process that could be a major factor in not just sustainably
171 developing a project, but also finding common ground in the desire for all stakeholders to
172 contribute to sustainable development. Taking life cycle assessments in development projects
173 as an example, green procurement considerations require a strengthening of the relationship
174 between the environmental criteria and the subject matter of the procurement contract that
175 follows. It could be further solidified by using a recognized 'gap bridging' mechanism, such as
176 BREEAM (Uttam et al., 2013). Another advantage of using green procurement in PPPP is to
177 improve the process more broadly. A PPPP may result in the suppliers adopting more cost-
178 effective procurement design, encourage cross-sector collaboration to better exploit
179 different competencies, as well as enhance the PPPP's procurement best practice criteria and
180 encourage better procurement planning and problem-solving amongst all of the '*P's*' in the
181 partnership (Nyakundi, 2016).

182 Concerning the study in this paper, the company Eidos represents PPPP in the Fjordbyen
183 project. Eidos is not just a development company in the traditional sense as it also acts
184 fundamentally as a *'tool'* working in conjunction with both the public and private landowners
185 involved in the Fjordbyen project. The public partner is Lier Municipality and Fabritius-
186 Gruppen is the private partner within the PPPP. Eidos has a dual role in this relationship as it
187 represents the third *'P'* in terms of both being accountable to the citizens, as well being the
188 development bridge between them and the broader PPPP itself. These roles represent both
189 a challenge and possibility in terms of ensuring that green procurement processes are
190 enacted, whilst ensuring that the needs of the overall project overcome some of the
191 potentially divergent interests of the stakeholders. The project is led by company created for
192 the task called *'Eidos'* that operates as a PPPP.

193



194

195

196 *Figure 2 – “Eidos”- the developer responsible for Fjordbyen development project*

197 As shown in Figure 2, Eidos is a company that is funding and meeting the immediate needs of
198 the municipalities involved in Fjordbyen, as well as the landowners of the land where it
199 currently stands. However, rather than be entirely motivated by the needs of these bodies
200 and their associated profits, they are also heavily accountable to the needs and requirements
201 of prospective Fjordbyen citizens the fourth P in the PPPP partnership. Furthermore, this is a
202 bilateral relationship where the citizen participations processes provide feedback to the
203 project and Eidos which in themselves result in changes. This exemplifies Eidos as PPPP due
204 to having the citizens themselves as accountable stakeholders.

205 3.3. Green Procurement in the Early Phase

206 With consumer pressure being increasingly the major driver for the development and
207 manufacture of more environmentally sustainable products (Michelsen et al., 2009), it is
208 natural that a greener procurement infrastructure would develop along with. In its most basic
209 terms, green procurement can be defined as:

210 *“the approach by which Public Authorities integrate environmental criteria into all stages of*
211 *their procurement process, thus encouraging the spread of environmental technologies and*
212 *the development of environmentally sound products, by seeking and choosing outcomes and*
213 *solutions that have the least possible impact on the environment throughout their whole life*
214 *cycle” (Bouwer et al., 2005).*

215 This reiteration of existing procurement can be best unraveled by defining such procurement
216 as taking standard processes and integrating sustainable development into them both at the
217 buying level and the choice of products that are service procured. In terms of the context of
218 the study in this paper, green public procurement has support at a legislative level, however,

219 this is no guarantee that such practices will adopt in public organisations, despite the positive
220 prospects concerning the environmental impact.

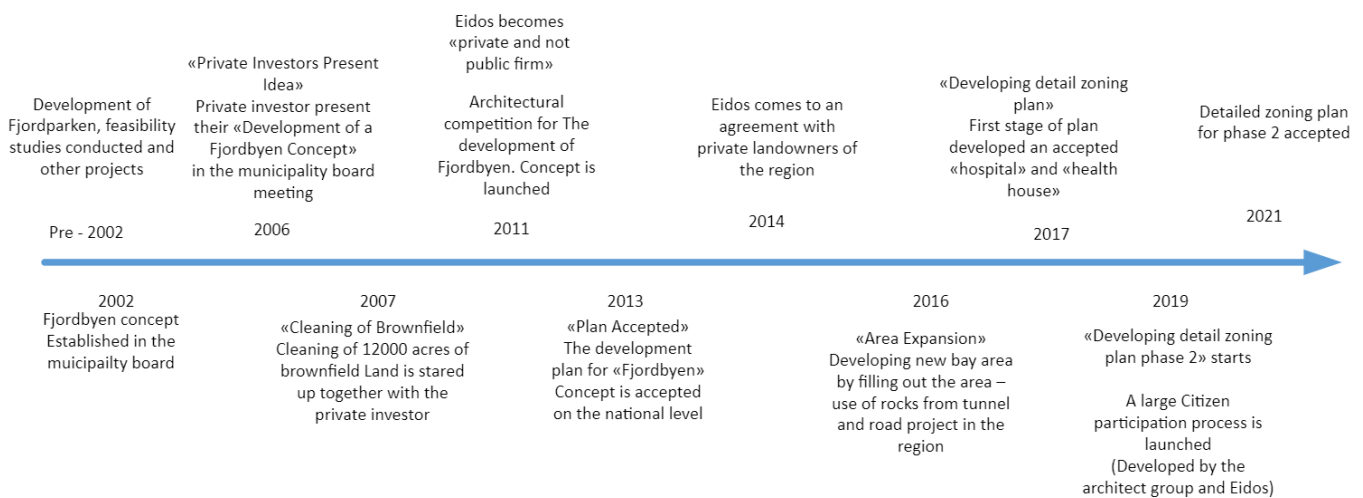
221 4 Analysis - The Green Procurement Phase of Fjordbyen

222 This part will highlight how the Fjordbyen project has been developed. How the different
223 stages have been executed and how the focus on green procurement has played an important
224 part in the transformation of the 2,5 km long and 1 200 000 m² of the bay area. The last part
225 of the chapter is a summary of the green procurement process that have been used in the
226 project's first phases. The project will go on for approximately 50-60 years, which represents
227 a challenge in terms of predicting the course of the whole project. This paper will focus on
228 the front end and the first planning stages and how the green procurement and focus on
229 sustainable goals has played an important role in the shaping of the whole concept.

230 4.1 Fjordbyen Project Overview

231 The municipality of Lier is approximately 187 square miles with a population of just over
232 27,000 people ("Om Lier Kommune" 2021). Located approximately a 30-minute drive from
233 the Norwegian Capital, Lier is situated economically as a part of the greater Oslo areas, and it
234 is administered and governed as a municipality. The Fjordbyen project is located on the
235 shoreline in Drammens Fjord and represents in effect the development of a new
236 neighbourhood or a small city. Fjordbyen will also feature artificial islands, a marina, parks for
237 recreation and a maritime center. The new development aims to transform 1 200 000 m² of
238 brownfield into a zero-emissions urban area that is green and future-oriented ("Fjordbyen
239 Lier og Drammen" 2021). The development project consists of three stages. Stage 1
240 Environmental clean-up, stage 2 Restoring and filling out one of two bay areas, and stage 3
241 Building of port, recreation area, houses, office buildings, schools, kindergartens, roads and

242 technical infrastructure. The goal for the development of the bay area is to settle at least
 243 16,000 new residents and 16,000 jobs in the Fjordbyen area. Whilst more than 15 years in the
 244 planning, the project in its current form began in 2002, the construction in the area began in
 245 2019 with the groundwork for the Drammen Hospital and the building of a new railroad
 246 station (figure 3).



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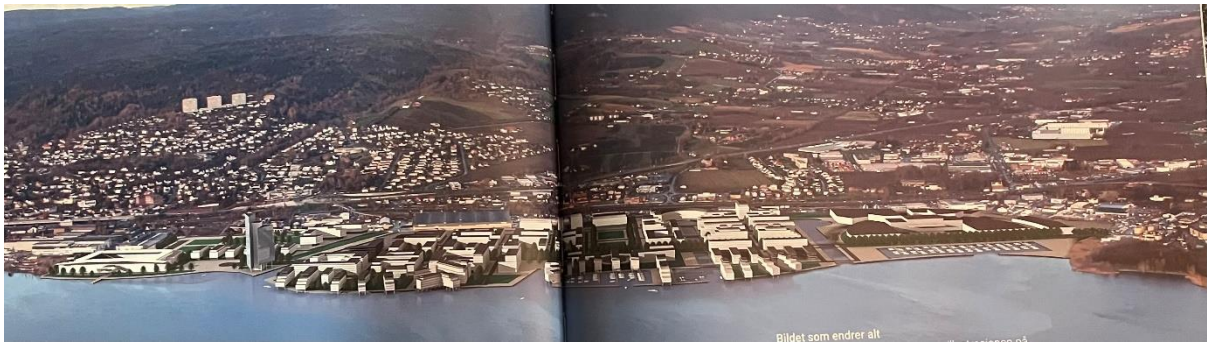
249 *Figure 3 The overview of the development process of “Fjordbyen” project in its early phase*

250 4.2. Overview of the development process of Fjordbyen

251 **The investor meeting**

252 In the fall of 2006 the owner of the Fabritus Group (a Norwegian real estate developer) was
 253 on an inspection trip at Lierstrand – he was offered to buy 70,000 m² brownfield area with an
 254 attractive location in the municipality of Lier, close to city of Drammen, but most of the area
 255 was heavily polluted. The owner of the company decided to buy it, and in November 2006 he
 256 invited the mayor to a presentation. On the wall in the board room of Fabritus Group was a
 257 large drawing presenting a vision of development of Lierstrand (Lier) and Brakerøya

258 (Drammen). The large drawing showed the future bay area with a football stadium, hotels,
259 businesses and service areas and housing, small boat harbour and channels (figure 4).



260

261 *Figure 4 The investors drawing of “how to develop Lierstranda and Brakerøya” (Andersen,*
262 *2020, pp.48-49)*

263 On 17th of November 2006, the owner of Fabritus Gruppen, presented the project to
264 potential stakeholders in an open meeting in the City Hotel in Drammen. The owner of the
265 Fabritus Gruppen presented their vision for the development of the bay area and illustrated
266 a solid plan for how clean up the Brownfield area. The Fabritus Gruppen was well known for
267 its world class expertise in cleaning and taking care of polluted soil and materials, so when
268 the owner presented a concept on how to clean up and make the whole area more valuable
269 for all stakeholders, with a solution for how to solve the huge pollution problem, along with
270 and acceptable level of costs and with high potential benefits for all of the different owners.
271 The vision for a new and green neighbourhood area “Fjordbyen” was established in
272 November 2006 and Eidos was given the mandate they needed to start up the next stage of
273 the process. The original plan presented in November 17 had 1000 houses, today’s plan
274 includes 16,000 houses (Fjordbyen 2020).

275

276 **Development of the zoning plan – how to procure the right advisors?**

277 The Norwegian government requires that when a property owner wants to use a land area
278 that is regulated for one purpose – industry – to another purpose – housing and stores- they
279 need to make a detailed zoning plan for the area they want to develop. In the autumn of 2010,
280 the municipalities of Drammen and Lier agreed on planning cooperation for the joint
281 development of Lierstranda and Brakerøya, resulting in the development of the industrial and
282 commercial areas of Fjordbyen. The purpose of this agreement is the preparation of a zoning
283 plan (area regulation) for area development on Lierstranda and the implementation of studies
284 related to this, following the Planning and Building Act § 12-2 Area regulation.

285 The following five main principles apply with regards to Fjordbyens processes:

- 286 1. The planning work must be up-to-date at all times plan program.
- 287 2. The municipality manages the planning work in line with the municipality's current
288 regulations delegation regulations.
- 289 3. Eidos whilst not the land owners, they pay for and carry- out the planning work, including
290 the preparation of necessary planning documents and maps, and submits proposals for
291 the municipality's administration.
- 292 4. The content of the plan presupposes following the guidelines given in the «Strategy
293 document Fjordbyen», adopted by the municipal council in Lier, as well as other
294 guidelines that the municipality may provide during the work.
- 295 5. The municipality's administration presents the case 1st-time treatment when the plan is
296 considered good enough.

297 This agreement regulates the parties' responsibilities and tasks in the planning process.

298 **Assessment of the duty to assess following the regulations on impact assessment**

299 According to the Planning and Building Act § 4-2 second paragraph, plans that may have
300 significant effects on the environment and society shall be impact assessed following
301 regulations on impact assessments with appendices.

302 The area regulation thus falls under § 6 of the Regulations on impact assessments for area
303 zoning plans (§ 12-2 according to the Planning and Building Act) which requires that area
304 regulation that facilitates commercial buildings, buildings for public or private services and
305 buildings for public purposes with a usable area of more than 15,000 m² must always be
306 impact assessed with a planned program. By Pbl § 4-1 and regulations on impact assessment
307 §6, an impact assessment (KU) must therefore be prepared in connection with the area zoning
308 plan for Fjordbyen Lierstranda.

309 4.3. Green procurement in the Fjordbyen project tendering for the purchase of the architect 310 and consulting services

311 The main assignment was the implementation of the Area Regulation related to functions and
312 design, heights and road system, public transport, green infrastructure, fjord landscape,
313 marine structures, any delimitations to agricultural, outdoor and nature areas for area
314 Lierstranda, in Lier municipality. The collaboration between Lier and Drammen municipalities
315 in the «Strategic platform with Master Plan» (Andersen, 2020) is based on a common desire
316 to develop an attractive urban area in the transition between the Drammensfjord, the cultural
317 landscape in Lier and the center of Drammen. The two municipalities will transform
318 Lierstranda and Brakerøya from an industrial and commercial area to an urban and
319 sustainable urban area that connects land and sea. The work in the regulatory phase and the
320 preparation of an idea sketch must relate to the premises that have been and are being laid

321 in the collaboration with Drammen municipality and ongoing planning processes in Lier
322 municipality.

323 **Procurement procedure**

324 8 company groups participated in the process, and they were given a ranking based one-bid
325 document that explained how they would solve the ambitions objectives of the project, CV of
326 key personnel and price matrix.

327 In the evaluation, the team were evaluated and given according to:

328 Price 20 %, competence 40 %, time plane and how to solve the project 40 %. It was
329 emphasized in the competence criteria that prospective bidders should have experience
330 working in the development of brownfield areas. They also had to provide CVs for the team
331 that could prove this kind of experience. More than 40 CVs were included as a part of this
332 process from each of the bidders.

333 After the ranking was made of all the bids the 3 best-ranked firms were invited into an
334 interview and they were given 1 week to prepare for their presentation of their schedule
335 and their plans and vision for the development of the brownfield area. EIDOS invited 3 of
336 the team leaders from each firm/companies group to present their bid and explain topics
337 and areas that were unclear. Each Interview took around one hour, and the firm/companies
338 group received the result the same day.

339 The process was conducted under strict regulation in following the Norwegian public
340 procurement act. The CVs were submitted to Eidos to ensure that people with the requisite
341 companies would be running the project from the most successful team. Since the interviews
342 changed the order between the bidders there was the need for some extra clarifications, but
343 after a couple of meetings the bid was finalized with the company group that Eidos felt had

344 made the best and most competitive bid based on the overall impression after the interviews.
345 It was lucrative contract that was to be signed, so it's understandable that the companies that
346 didn't get job was disappointed and somehow also would question the process. Eidos was
347 aware of this risk and made the process totally transparent. The process was designed
348 according to Norwegian public procurement act and the procurement process followed all
349 the laws and regulations. No ethical concerns were raised by the bidders after the finale
350 conclusion was announced for the bidders. No claims or complaints were tested in court after
351 the procurement process had been concluded.

352 **Project- start-up – onboarding of the selected firms**

353 A start-up meeting was held with the winning group WSP-LINK arkitektur-Multiconsult to
354 establish a better approach and guiding principles of the project overall. The presentation and
355 start-up meeting were led by Eidos. The presentation and start-up meetings were led by
356 Eidos. In the same meeting, they also asked the three companies that were the successful
357 bidder group about their ideas to use the BREEAM Communities framework as part of the
358 development process. Two other Norwegian projects had some experience with this
359 framework, and they were invited into the Fjordbyen project for a debrief of their
360 experiences. The project used the BREEAM Communities framework as a '*guidebook*' for how
361 to approach aspects of the planning process sustainably in conjunction with the already
362 extracted 6 most relevant sustainable development goals (SDG) from the United Nations
363 (UN), as seen in Figure 5.



364

365 *Figure 5 – The 6 UN Sustainability Goals used in the Fjordbyen project (UN, 2020)*

366 A BREEAM coordination team was established to follow the project planning process. It was
 367 fully integrated into the larger team and participated in the same start-up process as the
 368 others. Approximately 25 BREEAM related deliverables were made during the development
 369 phase. The BREEAM coordinator made a standardized procedure for how to connect to 6 UN
 370 goals and how to get focus on the right elements that matter in the BREEAM system – this
 371 was done for every one of the concept investigations (CI) and every CI had their BREEAM
 372 chapter with criteria with an associated KPI and/measurement attached. And this was logged
 373 on an overall scoring spreadsheet. The user participation processes were also included in this
 374 process. The initial plan could not be fully executed due to the Covid situation and the
 375 challenges this posed with regards to in person meeting, ongoing work and other associated
 376 factors. However, a successful set of surveys were conducted that reinforced that the project
 377 priorities broadly reflected the needs and opinions of potential future residents. The BREEAM
 378 Communities has a maximum score in three different categories that's ads up to 127- to get
 379 outstanding the score must be $\geq 85\%$, Excellent $\geq 70\%$ and Very Good ≥ 50

380 *Table 1 - BREEAM Score*

Stages	Max points BREEAM Communities	The BREEAM Communities score on “Fjordbyen”
1	28	24
2	52	42
3	47	28
Total score	127	94

381

382 According to EIDOS, this was the final score at the end of the planning stages, receiving 94
 383 points out of 127 or 74,02 % which translate to Excellent in the BREEAM Communities
 384 scoring system.

385 **4.4 Overall did the team fulfil the goals? Expectations, ambitions and prioritized goals**

386 Eidos and the representatives from Lier Municipality considered the result as highly successful
 387 and both representatives perceived that the overall plans have delivered on the projects key
 388 focus areas that were presented in the startup meeting. The plans were delivered on time,
 389 but there were some adjustments to the team and focus during the development process. For
 390 a 1.1/2-year planning process with more than 100 people involved some challenges and
 391 disagreements must be expected due to different cultures of a big team group (city planners,
 392 vs architects, vs technical consultants), different ideas about focus and concept investigation.
 393 The project manager from the bidder's side together with the EIDOS representative had the
 394 final decision prioritizing the concept. Due to the principle to create the team from the “*best*
 395 *men and women for the job* “, few conflicts appeared. The quality of the work is highly

396 evaluated - the plan is very well documented and the focus on green and zero-emission
397 development are achievable in +25 years.

398 The proposed zoning plan will be presented thematically from Feb 2022 and if necessary, some
399 elements will be adjusted before it is delivered for the final approval process in September
400 2022.

401 **Large challenges and uncertainties ahead**

402 The approval part in the municipal council is a risky process due to the huge investment cost
403 that must be approved to get the proposal over to the next stage, along with funding to
404 support the more longitudinal plans. There is a risk that Lier municipality could decide to
405 secure money for other projects in the municipality that might jeopardize some elements of
406 the plan. There is also a logic in how elements are interlinked, following the sequences in the
407 plan to achieve the zero-vision concept. Other local competitive projects also exist and
408 besides the Fjordbyen plan is linked to other project plans such as the new clean sewage
409 facility that is in the same planning stage.

410 *“The municipality is large, and it could be that people that live in the northern part don’t see
411 the benefit of using all the money on one “Fjordbyen” the next 10 years from now”.*

412 A question about ‘pace’ and how fast the “Fjordbyen concept” should be conducted if the
413 realization of the plans progress slowly was also presented. The best green solution concepts
414 were also questioned if some parts of the area will be under construction for many years.

415 Due to Covid, there have been fewer meetings with the politicians during the development
416 process, so it is possible that some politicians cannot understand the whole picture of the

417 benefits for Lier municipality. As “one kind in terms of size, green ambition and cost” it is
418 unique, and none of them have experienced something like the Fjordbyen concept before.

419 5 Discussion and Conclusion

420 The development of the Fjordbyen project reflects many of the qualities of project ownership
421 mentioned earlier in this paper. As stated by Ahola et al (2014), key personnel, ownership and
422 leadership within a project do not only establish the guiding principles behind the project but
423 also assist in fleshing out its defining characteristics. In the case of this project, the Fjordbyen
424 team firstly researched with potential residents to see if their preliminary vision was both
425 attractive and well communicated, both of which proved to be the case. Secondly, the
426 character of the project was further established by its green procurement practices, both in
427 terms of the procurement of suppliers and the team that would be used through the
428 progression of the project. All is then placed within the methodological umbrella of BREEAM.
429 By using SDGs as a form of ‘guidance’ in establishing what they wanted from suppliers and
430 staff, they were better able to conduct the process with a more sustainably credible approach.
431 Furthermore, the employment of BREEAM allows this logic to be expanded further, but this
432 time supported by well recognized and time-tested benchmarks and KPIs.

433 In terms of the timeline, this has been a long project that has been malleable both from its
434 content and overall objective. A large part of the land earmarked for the project was until
435 recently an export facility for the timber industry. In June 1971 ‘Lierstranda Industrialterminal
436 AS’ was founded to further the development of this part of the Fjord. According to Eidos, the
437 logic behind this development lay the groundwork for Fjordbyen half a century later
438 (Andersen, 2020, p.6).

439 Fjordbyen is now one of Norway's largest urban development projects, situated along the
440 2.5km shoreline with zero emissions considerations and sustainability at its heart. It has
441 officially begun with the construction of a new hospital at Brakerøya in 2019 in parallel with
442 the cleanup of Gilhus bay and gaining new ground.

443 The green procurement process considered is an element in this project.

444 5.1 The relevant decision-making processes and mechanisms in the smart and sustainable 445 urban development of Fjordbyen

446 In terms of the development of green decision-making processes in the Fjordbyen project,
447 there was a multitude of such considerations that were created. In terms of strategic-level
448 policy considerations, for example, the use of the UN SDGs along with BREEAM as guiding
449 principles ensured that decision making processes from procuring materials, tender suppliers
450 and hiring staff all worked well. This naturally brought with it challenges, such as for example,
451 the uncertainty surrounding the commitment to the project at the government level.
452 However, a strengthening of the PPPP approach in the earliest stages of the project can
453 mitigate this and similar challenges by creating better early-stage synergy between the
454 partners in the consortium (Xue et al., 2022). This can also reinforce aspects such as
455 'smartness' in smart cities as neighborhoods, which require similar synergy of sustainability
456 aspects to improve wellbeing (Collins et al., 2021).

457 To ensure that the key team was of a high standard, Eidos focused on employing staff that
458 would not just be on the project for its duration in the medium term but would also have a
459 high level of skills and team chemistry. Eidos, for example, was planning to employ BREEAM
460 consultants that would follow the project through multiple phases to make the processes

461 more efficient and consistent. This could only be achieved through a robust recruitment
462 process that focused on quality and retention.

463 The sustainable foundations were also carried forward into the tendering process for
464 suppliers and consultants. Whilst suppliers and contractors were in the initial phase selected
465 under traditional criteria related to costs and quality, then in the second phase, they were
466 selected based particularly on their competencies and experiences with the sustainability
467 focuses aspects of the project. Eidos were content with how this approach worked. This was
468 demonstrated more literally when some of the suppliers who were a part of the tendering
469 processes performed much better than expected.

470 With this being one of Norway's largest urban development projects, Fjordbyen has the
471 potential to position itself as a landmark project in terms of not just having a project with a
472 sustainable focus but also employing sustainable procurement practices across many aspects
473 of the way the project is being developed. The pioneering aspects of this project are not
474 restricted purely to the procurement processes, but also can be found in the high level of
475 citizen participation in the early project phase through workshops and surveys with potential
476 future residents. This did not just allow for Eidos and other relevant stakeholders to gauge
477 the needs and priorities of future residents but also reinforced that the planning processes
478 up to that point were in line with the expectations of residents.

479 5.2. RQ2: The green procurement processes and mechanisms in the development of a new 480 green neighbourhood

481 In terms of the green procurement and mechanism for the project, they have been constantly
482 orientated about creating a high level of value for the entire real estate development. This
483 was a multifaceted approach concerning both the needs of costs and tendering. In terms of

484 early-stage practical aspects, the cleaning of the land and fjord had to be conducted at a low
485 cost in order not to deter potential investors. In terms of the larger development, developers
486 had to consider in their development plans green infrastructure (i.e. easy access to public
487 transport), access to nature and high-quality outdoor areas, as well as a green marine
488 landscape. These needs were reinforced through the citizen surveys conducted earlier in the
489 project.

490 A key mechanism in allowing the project to go forward was to create a good and well-
491 developed area plan that could be realized. Whilst zoning considerations were a natural part
492 of this process, the Fjordbyen project has always had a business-orientated approach to
493 future development at its heart. With a guiding logic of green considerations being good for
494 modern business, Eidos and Lier municipality have been able to successfully realize their plan
495 and the interviews suggest that this has resulted in a town concept that will create value for
496 most of the stakeholders involved. The interviewees reinforce that the goals mentioned
497 earlier in this paper were ambitious in scope, but most of them were successfully achieved
498 and realized. Whilst some challenges remain concerning the logistical issues associated with
499 green mobility, there are considerations in place to overcome these as they arise. These were
500 guided to a greater or lesser extent by selecting the use of selective SDGs and BREEAM, which
501 supported both the sustainable agenda and provided value through using an established
502 certification methodology.

503 5.2 – Learning points from the Fjordbyen projects procurement processes

504

505 In terms of practical ‘take away’ learning points from the study in this paper, this can be divided by
506 each step or stage that the project has gone through up to the present day. This show in table 2
507 below and divided by the ‘*corporate and project*’ stages outline in Figure 1 by Klakegg (2017).

Table 2 – Learning Points from the study

Conceptual Stages	Learning Point
Brief and concept development	<p data-bbox="805 297 1362 331">Visionary leadership in instigating the project.</p> <p data-bbox="805 367 1369 506">The development of a cross stakeholder organization (PPPP) representing the interests of the private, people and public sectors involved in the project.</p> <p data-bbox="805 542 1385 647">Clear agreement between all partners – referring to the ‘5 principals for development of Fjordbyen’.</p> <p data-bbox="805 683 1243 716">Involving citizens in the early phase.</p>
Planning of chosen concept	<p data-bbox="805 799 1347 904">Sustainable considerations and ‘<i>master planning</i>’ at the initial strategic stages of the project.</p> <p data-bbox="805 976 1370 1041">Feasibility studies to establish scope, financing and logistics.</p>
Procurement and tendering	<p data-bbox="805 1086 1342 1191">Organizing interviews during the bidding evaluation process, with a focus on BREEAM solutions.</p> <p data-bbox="805 1227 1342 1292">Hiring of a BREEAM and sustainably focused team for long term employment.</p> <p data-bbox="805 1328 1362 1433">Consideration of essential tools and resources for a BREEAM approach to the design as early as possible.</p> <p data-bbox="805 1469 1118 1503">Onboarding and initiation</p>
Cleaning and Developing of the bay area land	<p data-bbox="805 1516 1358 1655">Regeneration and cleaning of land, area expansion, landscaping and added value. Clear agreement on who needs to pay for the cleaning of the land,</p> <p data-bbox="805 1691 1315 1756">Agreement for sharing the ownership and profits for the “<i>extra land</i>”.</p> <p data-bbox="805 1792 1358 1897">Improvement of the environment to ensure a high level of wellbeing for citizens, future residents and the surrounding regions.</p>
Developing the detailed zoning plan	<p data-bbox="805 1946 1382 2051">Measuring the scope to ensure and deliver high BREEAM ratings such as ‘Excellent’ and ‘Outstanding’.</p>

	<p>Emphasis on quality of life and multi demographic inclusivity.</p> <p>Open areas and facilities for recreation and wellbeing (canals, bathing areas, access to nature).</p> <p>Secure the direction of the future structure and delivery in the development of the zoning plan.</p>
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509

510 **6. Conclusion**

511 In conclusion, the sustainable procurement mechanisms and decision-making processes
512 adopted in Fjordbyen represent a unique case for further development and replication in the
513 context of the development of brownfield sites.

514 By adopting a high-level sustainable approach early in the project's lifecycle, Fjordbyen has
515 been able to ensure the project's sustainable credibility in each subsequent step of its
516 development so far. This fed in not just to guiding ethos being Fjordbyen but also links to the
517 project ownership qualities. This has manifested more tangibly through a strict tendering
518 strategy that incorporated sustainable competencies as a part of the selection process.
519 Another more tangible example is that of employing the use of BREEAM certifications to guide
520 the process from a more regulatory perspective. In terms of less tangible aspects, the
521 promotion of value within all sections of the project for the majority of stakeholders is seen
522 by Eidos and Lier Municipality as one of the most successful parts of the Fjordbyen project to
523 date.

524 In terms of further research, the results of this study present an opportunity to see if these
525 processes are replicable with similar levels of success in other Norwegian urban development
526 projects. Furthermore, there is also the scope to investigate the generalizability of these
527 outcomes and see if they can be equally as replicable at the European and even world scale.

528 In terms of who could benefit from the results of this study, urban planners, project
529 management, facilities managers and scholars working with added value management could
530 all find aspects of this study that could be useful to their work.

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