

Spatial Planning and Policy: An Enabling or a Procrastinating Actor of Sustainability Design Decisions?

Building design is a highly complex process and design decisions are subjected to both technical and social influences, either from external or internal parameters. Decisions taken during the design of buildings are a vital factor in determining their carbon impact throughout their whole life cycle. A growing literature has dealt with the significance of the building design process, highlighting its influence on the carbon impacts and identifying the most important stages and stakeholders which affect these impacts. Spatial planning and policy is one of the first limitations that designers have to consider, and is often out of their control since it is based on local and national plans. Interviews with practitioners reveal that those plans are one of their most important influences or limitations in shaping the carbon impact of a project. Moreover, the level of detail prescribed by those plans can have a different influence on the behaviour of the designer. This article aims to understand the interactions of practitioners and the planning policy documentation in two very distinct European cultures and contexts, Sweden and Cyprus, and the effect of different planning and policy models on the designers' activities.

Keywords: *planning, policy, building, housing, sustainability*

Introduction

Sustainability is yet a very common term, which is gradually used in more and more fields and disciplines; while this increases awareness and familiarity, it makes it even more broad and vague. This broadness increases dramatically when considering already complex fields and structures, such as the built environment. Buildings are major consumers of energy and natural resources, and one of the main actors responsible for carbon emissions, climate change and resource depletion. [1].

Depending on the type and scale of a development, standards and regulations [2]–[5] address some basic principles such as the operational energy performance (e.g. the EU Energy Performance of Buildings Directive [4] and the environmental impact assessment (EIA). Moreover, numerous policies and regulations exist within the European legislation regarding the assessment of the environmental impact of construction materials [6].

Following the focus of earliest actions mainly on the operational energy of buildings, evidence suggest its gradual decrease especially after the introduction of the EPBD in 2010 [5], [7]. A rising number of experts though have been drawing attention to the management of lifecycle impacts ([8]–[14]. Regulations or declarations on the environmental impact of buildings started being introduced (ie France, Sweden, Denmark) as well as technical guides on a sustainable outcome, such as the RIBA Plan of Work 2013 Document [15].

1 Moreover, more recent advancements include whole life carbon assessments,
2 such as the professional statement of the Royal Institution of Chartered
3 Surveyors (RICS) [16], [17]. In practice, all those can be considered as
4 additional parameters to the already complex building design and shape design
5 decisions.

6 Decisions taken during the design of buildings are a vital factor in
7 determining their carbon impact throughout their whole life cycle. The various
8 social and technical interactions arising either from the numerous parameters
9 that need to be considered but mainly from interdependencies among
10 stakeholders of different profiles, and cultures, make the design a highly
11 complex process. A few previous studies demonstrate the dependency of
12 sustainable design with socio-technical factors (4,8-12) or suggest alternative
13 approaches to the standard design practises (ie integrated design (ID) [18],
14 Concurrent Engineering (CE) [19], frameworks [20]) or suggest the need of a
15 holistic and transparent design [21]. A great value is given to the introduction
16 of regulative actions; it is believed that a change of attitude and culture of the
17 construction industry needs to be driven by the introduction of regulations and
18 national targets [22], [23]. Legislative requirements are widely considered as
19 one of the most significant barriers [24], and as a crucial driver for the market
20 [25] towards the integration of early design stage carbon assessments.

21 According to Schröder [26] *“‘Sustainability’ has become a well-*
22 *established lens through which to conceptualize the environmental challenges*
23 *in architectural design”*. He argues that sustainability needs to be translated
24 into planned actions, strategies and meaningful definitions considering a range
25 of cognitive, social, cultural, and material elements. This indicates the need to
26 understand the building design process in practice and how it is translated by
27 practitioners, what do they consider as important decisions and significant
28 influences or drivers of environmental sustainability.

29 This paper presents practitioners’ views on the role of spatial planning and
30 policy on the environmental sustainability of building design and how it
31 influences the designers’ decisions and behaviours relevant to environmental
32 sustainability in public housing projects in Cyprus and Sweden. The original
33 objective of this study was to understand what happens in practice during the
34 design of buildings and the various socio-technical influences of design
35 decisions, as well as how environmental impacts are considered in various
36 cultures across Europe. Among others, planning policy and supporting
37 documentation was indicated as one of the first and most important influences
38 on design decisions, as mentioned in our accepted manuscript [27] . This paper
39 looks into the role of planning policy in more depth and in particular on its’
40 influence on the behaviour of the designers themselves when considering the
41 environmental sustainability of their project.

1 **Literature Review**

2
3 There is a large volume of literature dealing with the role of spatial
4 planning on climate change [28]–[36]. Giddens[37] suggests that we have to
5 reconsider planning, and introduce long term policies; he argues that planning
6 is a much more complex process than it seems and dealing with public attitudes
7 is one of the key parts on which spatial planning policy has to respond to [29].
8 Wilson [32], looking at the role of local spatial planning notes that some
9 obligatory requirements might be needed and shifted at a local level to serve as
10 a form of agency from local authorities, enhancing their role. In general, the
11 context of spatial planning is changing, prioritising environmental challenges
12 and eventually becoming a coordinating tool integrating various policy
13 directions [34].

14 Spatial planning has previously been shown to be a very important tool for
15 the mitigation of climate change and the management of the impacts of the
16 built environment, [33] and can even play a more significant role when it is
17 addressed on a local or municipal level [32], [38]. Planning policy is indeed
18 claimed to be a very effective tool and can have a significant contribution in
19 climate change mitigation; either a positive or a negative in cases of bad policy
20 [33].

21 On these grounds, it can be presumed that national and local authorities
22 should set specific planning strategies and introduce explicit and obligatory
23 requirements through their policies to tackle climate change [39]. However,
24 planning policy implementation is an interactive and a two-way process which
25 involves various other actors and decision makers [40], such as contractors,
26 constructors, designers. Urwin and Jordan [41] questioned the ability of public
27 policy to support climate change mitigation and explored two different
28 approaches; a top-down and a bottom-up approach, focusing either on the
29 governance by policy-makers or the recognition of other actors respectively.
30 The authors concluded that the coexistence of both top down and bottom-up
31 approaches can create new perspectives on integrating climate action [41].

32 Spatial planning and policy vary across countries, both in terms of
33 planning, policy and implementation instruments. Numerous systems have
34 been developed across Europe and a few of them, especially in Western Europe
35 could be considered as best practices in terms of integrating environmental
36 issues [42]. Stead [42], argues that the role of best practices in policy-making is
37 limited as they cannot be directly transferrable; other influences arising from
38 cultural and institutional differences are often more important. At the same
39 time, the economic, political and social situation can influence the priorities of
40 the planning policy, such as prioritising investments and market needs [43]–
41 [46] or national diversity [47], [48] and cultural context [36].

42 Spatial planning and policy is one of the first limitations that designers
43 have to consider, and is often out of their control since it is based on local and
44 national plans. Interviews with practitioners reveal that those plans are one of
45 their most important influences or limitations in shaping the carbon impact of a
46 project [27]. Moreover, the level of detail prescribed by those plans can have a

1 different influence on the behaviour of the designer. This study examines the
2 role of different planning policies in two European cultural and industrial
3 contexts on the environmental sustainability of residential developments as
4 well as their influence on the designers' behaviour.

5 6 7 **Methodology**

8
9 This study aims to understand the decision-making process during the
10 design of buildings towards reducing their whole life energy and carbon. This
11 is done by an investigation of public housing projects in Sweden and Cyprus,
12 using a qualitative approach to look at the factors that shape their
13 environmental performance, with a particular focus on the influences on the
14 designers' decisions. The original design of the study as well as the choice of
15 the case studies and the data collection method followed an inductive approach,
16 with a broader focus on understanding how environmental decisions are taken
17 within the real-world practice of the building design. The focus on spatial
18 planning and policy arose later, during the data analysis. The aim of this article
19 is to understand the interactions of practitioners and the planning policy
20 documentation in two very distinct European cultures and contexts, Sweden
21 and Cyprus, and the effect of different planning and policy models on the
22 designers' activities.

23 The study adopts a naturalistic research paradigm, since it seeks to
24 understand phenomena in its real-world setting [49] using case studies that can
25 provide an understanding of the whole setting and to look at it within its wider
26 context [50]. Case study research provides qualitative insights into the studied
27 phenomena in their real-world setting [49], [51]; it is considered as an
28 appropriate approach to understand how and why some social phenomena work
29 especially within their complex real-life context and particularly when
30 considering decisions ([51]–[53]). It can allow for building up in-depth,
31 context-dependent knowledge and provide rich accounts and narratives, that a
32 broader study might miss [54]. Case studies were used for addressing the
33 research questions, conducted in three contexts, aiming to gain insights from
34 different cultural characteristics of the building industry across Europe.

35 The rationale for case selection depends on the study; cases may be
36 selected either to represent extreme values or maximise variation along a
37 certain parameter, or to exemplify a broader category [54], [55]. For the
38 purposes of this study, four recently completed public housing projects were
39 investigated, two in Sweden and two in Cyprus. The country selection aimed to
40 increase variation of the cultural context within Europe, and allow for insights
41 from different design situations, settings, and national context. Indeed, the
42 countries are diverse in terms of climate, population, area, planning trends and
43 culture. Regarding the spatial planning, Sweden, in Northern Europe, follows a
44 comprehensive spatial development approach with a system of controlled rules
45 and regulations. From the other side, Cyprus, in South-Eastern Europe, has
46 influences from the Mediterranean urbanism tradition, more ad-hoc developments

1 and clientelist relations [56]. Regarding the type of developments, a focus on
2 public housing allows a comparison of housing types serving similar a purpose,
3 both within as well as between countries. The provision of housing in Sweden
4 is done in a municipality level, through municipally owned real estate
5 companies, whose objective is to provide affordable rental housing. In Sweden,
6 the development model of new projects is partly predefined at a local level.
7 Local authorities deal with the spatial planning, policy and implementation;
8 they produce local development plans, by which the basic typology of the
9 buildings may be predefined, such as the façade materials, the frame type and a
10 minimum environmental performance level or rating of materials. In Cyprus,
11 public housing is provided in a national level, by a national association
12 operating under the Ministry of Interior; the association's objective is to
13 develop and sell affordable housing to low- and medium-income applicants,
14 i.e. implementing the governmental housing policy.

15 The objective of the case study selection was to represent the mainstream
16 and the best practises in each country. Consequently, the first project in Cyprus
17 represents traditional, mainstream practices in the organisation while the
18 second reflects more recent aspirations on improving quality and
19 environmental performance, by the introduction of an architectural
20 competition. A similar selection was intended in Sweden; both a rather
21 mainstream and a best practice project were selected, but the latter was
22 replaced due to major setbacks, resulting in significant delays and difficulties
23 in interviewing key actors. However, even if both Swedish cases ended up
24 being rather mainstream, both projects have environmental ambitions above
25 mandatory requirements.

26 Data were collected through documentary analysis and interviews with
27 practitioners. Design documentation for each case was first collected (including
28 drawings and models, internal communication documents, design guidelines,
29 energy performance certificates) and analysed in order to understand the design
30 process and identify the most important decisions, the stage they are taken and
31 under which circumstances, by who and based on what criteria or influences,
32 whether the process involves the use of an LCA or some other method and (if
33 so) how that influences the design. Additional documents mentioned by the
34 interviewees or highlighted by the preliminary analysis were collected and
35 analysed after the interviews, such as an overview of the detailed development
36 plans, the strategic development plans and zoning plans of each area,
37 Ministerial policy statements or municipal design program.

38 Semi-structured interviews were then conducted, using open questions to
39 gain an in-depth understanding of the participants' perspectives [57]. The
40 interview was conducted in the form of a discussion guided by an interview
41 template and the content of the responses and sought to collect information
42 about the background the interviewees and their role in the project or the
43 organisation as well their views on how decisions are taken within the
44 organisation and the case study project, their interpretation of environmental
45 performance and sustainability, as well as what decisions they consider as
46 important for a building's environmental performance. The last part of the

1 interview sought to understand the experience of interviewees - mainly the
2 ones with a technical background - with Life Cycle Assessment (LCA) method
3 or other decision support tools. Interviewees were also asked on their views on
4 when and how those tools could be introduced in their projects.

5 The initial selection of the interviewees was made on the basis of
6 indications from previous literature on key actors on sustainable design [58],
7 [59] and project documentation; more participants were added following
8 indications from other interviews (snowballing approach). Interviewees
9 included designers involved in the design of the projects, as well as other
10 stakeholders involved in various stages of the projects such as managers,
11 administrators, and directors. The interviews were conducted in 2020 mainly
12 remotely using IT equipment, over approximately an hour video calls, due to
13 the restrictions of the Covid-19 outbreak. The interviewees native language
14 was used during the interviews, which were then transcribed and translated in
15 English. Two of the authors conducted the interviews separately (one in
16 Sweden and one in Cyprus) and conducted their initial analysis. Using the
17 translated transcripts, both interviewers went through all interviews to conduct
18 a joint analysis.

19 The analysis was done by coding and explanation building [60] closely
20 following the empirical evidence. The approach aimed to build a description of
21 the design process of each case study and to identify important decisions or
22 actors influencing the environmental sustainability of the projects. Thematic
23 analysis indicated themes for further analysis. The significance of spatial
24 planning and policy which eventually led the focus of this study became
25 apparent through induction and through our analysis of the role of artefacts in
26 mediating sustainability (see [27]). Eventually, the analysis focused on
27 investigating interactions between designers and the planning system and how
28 this affects their behaviours.

29 The study is part of a research focusing on understanding design decisions
30 and their effect on whole life carbon of buildings and on how tools such as
31 LCA could support sustainable design decisions. While this shaped the initial
32 perspectives and the interest of the researchers, it did not divert the focus of the
33 analysis.

34 35 36 **Results**

37 38 *Introduction*

39
40 Following the analysis of the data gathered, it became apparent that the
41 decisions of the designers, and in particular the architect, are subjected to
42 external factors, providing either limitations or enforcement. Quoting the
43 response of an interviewee from Cyprus:

44
45 “Important design decisions are taken at the **beginning** of the project and
46 unfortunately they are taken **outside** the project, i.e. from **planning** and **regional**
47 **authorities**” (Cy 08, Management - Directors)

1
2 One of the first and main limitations that designers consider crucial for the
3 sustainability of their design is the regional and contextual context. This
4 parameter is considered as a defining factor for the environmental impact of the
5 project that is at the same time out of their control, since it is mainly governed
6 through the spatial planning and the planning policy of each country, including
7 national or regional zoning and detailed plans or development policy
8 statements and legislative acts.

9 This view was echoed by a couple of designers in Cyprus while reflecting
10 on limitations and influences on the designers' decisions:

11
12 “First and most important limitation, are the **development coefficients (land and**
13 **coverage factors)** of each area ...Those coefficients as well as the **regional**
14 **characteristics** of the area itself. Those factors provide **guidance and**
15 **limitations** to the architect for a particular area. The architect needs to use and
16 satisfy the limitations of those factors; the **developments coefficients, the**
17 **regional context** limitations resulting from the **Town Planning Policy...**”
18 (Cy 02, Architect)

19 “The first step of a designer is to consider the current legislation and the
20 **development coefficients** from the **zoning plans** to determine the layout and
21 number of units in the development as well as the **required performance**, ie
22 energy efficiency.” (Cy 11, Civil Engineer)

23
24 This was a common view amongst interviewees on the influences and
25 limitations on their decisions regarding the environmental impact of their
26 design, identifying those as been the contextual and regional requirements,
27 including zoning plans, development coefficients, design handbooks etc.

28 While important in both countries, different models and planning cultures
29 were identified in the two countries; Sweden follows a system of controlled
30 rules, regulations and certification criteria, while Cyprus seems to rely on ad
31 hoc developments and clientelist relations, a system commonly met in most
32 Southern European cities [27], [36]. In particular, local plans in Sweden may
33 restrict design choices, such as imposing the use of a particular façade material
34 or frame type. Moreover, municipalities in Sweden used to set overarching
35 requirements on e.g. the energy performance of the dwellings. [27]. In contrast,
36 in Cyprus local plans mainly deal with the area coverage factor and height
37 restrictions, especially when considering rural areas; materials and frame type
38 are mainly depended on the designers' decisions.

39 40 *Spatial and Planning Policy as an Enabling Actor of Sustainability*

41
42 Based on the analysis of the cases, it became clear that spatial planning
43 and policy are vital for the sustainability of a housing development. Designers
44 consider it the most important influence on their decisions, having a great
45 impact on the environmental impact of their design both from a micro and a
46 macro scale perspective. Zoning plans can restrict the density of the
47 development or the height of the buildings or even provide limitations on the

1 layout and orientation. At the same time, detailed plans introduce additional
2 restrictions which can be as generic as on the type and use of the development,
3 to detailed restrictions on façade and frame materials.

4 A few actors from the cases in Cyprus, claimed that the environmental
5 impact of their project is either not their responsibility or to a great extent out
6 of their control; they claim that it is up to the planning authority to prepare the
7 strategy and provide policies on the issue through the planning policy. At the
8 same time, the objective of a public housing organisation itself, ie to keep the
9 selling price of the buildings as low as possible, can be another barrier on
10 introducing improvements not associated with capital cost reductions.

11
12 “Environmental decisions are taken from local plans. It is not the architect that
13 makes decisions; they are made according to the urban planning design and
14 policy of each area.” (Cy 05, Architect)

15 “Our objective is to keep the cost of the units as low as possible, so we do not
16 normally apply additional improvements but those obligatory. The environmental
17 or the energy performance of a building is usually defined by what is required by
18 legislation or by restrictions given by local authorities” (Cy 11, Engineer)

19 “The most important parameters for the environmental performance of a project
20 are the geographical location, the design of the building units themselves, such as
21 the orientation, the energy performance the materials used. Those parameters
22 should be considered from the very early design stages. However, **in practice we
23 only try to meet the minimum mandatory requirements set by national
24 regulations and local authorities, since they would be checked for the
25 purposes of issuing building permits.** So, I support that those parameters
26 should be introduced **as restrictions or at least recommendations.**” (Cy 09,
27 Engineer)

28
29 The participants on the whole demonstrated that planning policy is a key
30 driving actor for the environmental sustainability of residential developments;
31 it is crucial to develop an environmental strategy and policy with detailed and
32 obligatory plans and regulative documents. This will serve as a medium for
33 securing a minimum level of environmental sustainability within new
34 developments; at the same time, it is a channel through which proposed
35 developments would go through a first compliance verification, through the
36 application for planning and building permits. In Cyprus for instance, although
37 the only aspect currently obligatory is the energy performance certificate, it is
38 evident that it had a great impact on the improvement of the energy efficiency
39 of the building stock [5]; apparently, more targeted actions are required to
40 focus on considering the whole life carbon impacts.

41 At the same time, having a minimum level of environmental sustainability
42 requirements included in the planning policy can provide a reference point for
43 more ambitious individuals. Talking about this issue - even though being
44 assertive that it is not the architect’s responsibility to consider environmental
45 decisions – an interviewee commented that:

46
47 “an architect should first have the ability to design something that can meet
48 predefined criteria, such as **restrictions from local plans, energy performance**

1 **directives** and **budget**; it is then open to the designers' will, creativity and
2 motivation to either conduct an innovative design, or just satisfy the criteria." (Cy
3 05, Architect)
4

5 Similar views were expressed by Swedish participants, both as a channel
6 to secure that sustainability will be considered, but also as a minimum
7 reference point for individuals that want to go further than that.
8

9 "Personally, I completely understand setting requirements in **detailed plans**, it
10 leads to more beautiful and better environments for people, I think. If you leave
11 the detailed plans open, the builders will build the fastest and cheapest solution,
12 and it is not certain that it is the best" (SE 01, Architect Consultant)

13 "...we work under the Planning and Building Act, so there are these basic
14 requirements.....we manage to build by keeping the environmental standard
15 based on the Planning and Building Act. Then you can choose to go even further
16 there if you want." (SE 02, Architect Consultant)
17

18 The majority of the interviewees showed that climate change issue and the
19 urgent need for actions on carbon reduction is widely acknowledged who at the
20 same time highlight the need for state-driven actions.
21

22 "Considering that there is a very serious issue with the greenhouse effect.....
23 considering environmental performance should be one of the designers'
24 priorities. Environmental performance should be introduced by the state, through
25 legislation and policy." (Cy 11, Engineer)

26 "As a nation and an EU member state, we have to take action to reduce
27 greenhouse gases; the government have to implement and promote measures and
28 regulation within its planning and policy, so that all buildings will assist on those
29 targets; then, it will be an obligation that everybody would follow." (Cy 11,
30 Engineer)
31

32 Indeed, when questioned for the most important factors that enhanced the
33 improvement of the project's environmental performance, a participant from
34 Cyprus noted that those were
35

36 "the zoning plans and area coverage factors" (Cy 04, Engineer).
37

38 On the contrary, another architect supports that it is the architect's
39 responsibility to study all the parameters, such as bioclimatic principles,
40 materials, energy demand based on a value engineering approach and a
41 contextual strategy and provide a quality design for each case. This is
42 something that should be done without expecting the legislation to exert direct
43 control:
44

45 An architect should function as a consultant, not just a designer, and offer the
46 optimal solutions for each project. He shouldn't need an enforcement by the
47 legislation to make a quality design; the legislation can only regulate it up to a
48 point. (Cy 10, Architect)
49

1 A thorough planning policy and documentation can also serve as a safety
2 net to the owner of the project, even if no sustainability aspirations or specific
3 requirements are predefined. In our cases, this was proven to be useful during
4 the procurement stage, allowing for parameters already obligatory by the
5 planning authority such as the energy efficiency been considered as implied:
6

7 “The requirements of the local plans and the policy documents could be useful
8 for a client, or the housing organisation in our cases, since they provide a
9 minimum level of performance that should be met by designers. For instance,
10 if the energy performance of a design does not meet the requirements of
11 national regulations, a building permit would not be issued.” (Cy 10,
12 Architect)
13

14 In the same vein, another interviewee reflects on the significance of the
15 early introduction of environmental decisions in the design of a project; and the
16 role of planning authority to control them:
17

18 “Environmental decisions should be introduced from the very early stages of the
19 design, while applying for planning permits – anyway they also have to comply
20 with planning requirements to be approved (Cy 6, Engineer)”
21

22 *Spatial and Planning Policy: Enabling Procrastination* 23

24 Building environmental sustainability is a very broad notion and can be
25 extremely complex, in particular when considering the whole life implications.
26 Reducing the whole life carbon of a building often requires a holistic and
27 collaborative approach; an ongoing process initiating from the very early
28 design stages. Considering sustainability and whole life carbon prerequisites
29 awareness and experience by all involved stakeholders. There isn't yet a widely
30 acceptable design tool, benchmark or a guidance to consider the whole life
31 carbon impact and normally tailored decisions are required on a case-by-case
32 basis. Quoting the view of a Swedish participant:
33

34 “working with high environmental performance takes more commitment and
35 more detective work to be active in the design, and look at the best environmental
36 solutions when it comes to material selection and energy consumption”. (SE 10,
37 Project Manager)
38

39 The previous section reflected on actors that considered planning policy
40 and upstream introduced regulations as a tool to initiate or motivate
41 environmental sustainability. Following a further analysis focusing on
42 “responsibility” it can be noted that actors that support the introduction of
43 carbon reduction measures from the planning authorities, often deflect the
44 responsibility to other actors too, often upstream. Eventually, this section
45 reflects on responses that directly or indirectly indicate a procrastination in
46 considering environmental sustainability, either because actors do not consider
47 it as their own responsibility, or because they do not consider that they the
48 power to influence.

1 As mentioned in the previous section, the necessity of taking action
2 against climate change is acknowledged; however, it is believed that the main
3 driver should be governmental initiatives through regulations and planning
4 policies. As one interviewee commented:

5
6 “Considering that there is a very serious issue with the greenhouse effect, we
7 should have already done something about it, especially as a public housing
8 organisation. However, this is not what is done in practice. Especially in Cyprus,
9 we are far behind from considering environmental performance, which should be
10 one of the designers’ priorities... **Environmental performance should be**
11 **introduced by the state, through legislation and policy.** It cannot rely on the
12 individual’s sensibility. Sensible designers and developers might consider it
13 themselves, but they also have to consider other parameters, such as cost.” (Cy
14 11, Engineer)

15
16 What seems to be happening in practice is that many practitioners rely on
17 state-driven actions and just tick the boxes of what is required by the
18 legislation. According to an engineer in Cyprus:

19
20 “There are not any performance requirements or specific parameters to consider,
21 since everything is given by planning and regulations... we know what to take
22 into account according to the law of Cyprus. There are some minimum
23 requirements” (Cy 03, Engineer).

24
25 Likewise, the environmental performance is often interpreted as a need to
26 fulfil regulations and directives. For instance, a project leader explained that:

27
28 "Working with environmental performance means meeting the requirements that
29 we have as set by the owner, the municipality, has set requirements for the
30 company [...] We should be able to report that we **meet those requirements**.
31 That's my **driving force**. [...] We think we are at a good level where we **meet our**
32 **directives**. That's why **we are not working with it further**. We are **complying**
33 **with the directive** when it comes to the environment. So **that's enough**... "(SE
34 10, Project Manager)

35
36 A very detailed enforcement or guidance shifts the balance of
37 responsibility towards public authorities and gives the designers a narrower
38 range of possible decisions. In some cases, designers consider that the
39 environmental outcome of their project is out of their control or responsibility,
40 that somebody else has already done the work and considered the sustainability
41 of their project. To illustrate, an architect from the Swedish cases commented
42 that:

43
44 “Many people think that we architects have a lot of power, but we do not really
45 have, I don’t think so.” (SE 01, Architect Consultant)

46
47 A high level of obligatory criteria can lead designers to perceive that they
48 have a low level of responsibility or power to influence environmental

1 performance. A comment from an architect in Sweden, shows that he doesn't
2 consider he performs an actual design when most of the parameters are
3 predefined:
4

5 "But then also, this is housing, there is quite a lot that is given regarding what to
6 do with housing. I otherwise work a lot more with premises, and then you may
7 need to design a little more." (SE 01, Architect Consultant)
8

9 Likewise, another comment from an architect in Sweden shows that he
10 doesn't consider the architect as having enough power, since a lot of
11 parameters are out of their control.
12

13 "I wouldn't consider the architect as a decision maker in terms of the
14 environmental impact; ... Requirements regarding the environmental impact such
15 as frame, façade are set by the detailed development plans or the directives,
16 which are decided by politicians; so, politicians are the actual decision makers.
17 (SE 01, Architect Consultant)
18

19 this is in contrast with practitioners' views in the cases in Cyprus, where the
20 majority of them claimed that the most important decision maker is the
21 architect:
22

23 "The architects are the most influential, because they take all decisions, in fact
24 they are doing the design." (Cy 02, Architect)
25

26 *Spatial and Planning Policy as a Tool for Collaboration/Innovation* 27

28 A particularly interesting result extracted from the study, is the role that
29 planning policy can play as a tool for collaboration and consultation. This was
30 evident in both countries, although more emphasized in Sweden that the policy
31 involved a higher level of detail and significantly more supporting documents.

32 Collaboration can be developed in various levels and between national and
33 regional authorities, private consultants and contractors. In Cyprus, no
34 collaboration was mentioned at the preparation of planning policy; however, a
35 consultation with the national planning authority was conducted when the
36 design dealt with a new development of a new rural area regarding potential
37 verifications or amendments on the zoning plans. However, this did not include
38 any discussions on the environmental implications or sustainability in general;
39 this sort of discussions were made within the organisation and its own
40 consultants and contractors. On the contrary, a few Swedish practitioners
41 declared with a great enthusiasm that the design of their projects was a great
42 opportunity for collaboration with the authorities – on a municipality level in
43 that case. Moreover, consultants seem to be gratified by the fact that they had
44 the opportunity to work with the municipalities, which in Sweden are often
45 ahead of the industry and try to be the example. Sometimes they even introduce
46 measures over and above their obligation:
47

1 “municipalities are often quite ahead of the rest of the industry when they make
2 detailed plans in new areas, to either inspire or because when they purchase land,
3 they set requirements on how it should be built, or in what way. And then the
4 developers now start to follow and finally the contractors as well. (SE 02,
5 Architect Consultant)

6 The municipality can set requirements for what environmental standard it is in
7 addition to what the building permit says. (SE 02, Architect Consultant)

8
9 As presented by the Swedish actors of one of the Swedish cases, the
10 project started with a consultation to receive feedback from the community, the
11 users of the building to feed their planning documents and amend the detailed
12 plan of the area. All stakeholders were involved from the beginning, and this
13 seemed to have resulted in a great experience and knowledge exchange of all
14 parties:

15
16 “I can say this, the process of this project was one of the most fun I've been to
17 and most rewarding, because we had a long time and the municipality developers
18 have a lot of internal knowledge, so you could ask a lot of questions and... the
19 process means that there will be better buildings inside out, from apartments to
20 outdoor environments” (SE 02, Architect Consultant)

21
22 In fact, it can be concluded that consultation and collaboration can be the
23 balance among the issues discussed in the two previous sections. That is to say
24 that detailed plans are indeed very important and should aim to include as more
25 clear and obligatory information as possible to secure a minimum level of
26 sustainability. An open and transparent consultation with all stakeholders, both
27 at the preparation of the detailed plans but also during potential amendments –
28 in the case of a huge development – is vital in order to avoid maintain
29 enthusiasm and motivation of individuals and at the same time raise awareness
30 and assist knowledge exchange among practitioners and authorities.

31 32 33 **Discussion**

34
35 The objective of this study was to understand the building design process
36 and identify the most important parameters that have an impact on the whole
37 life environmental impact of buildings, including external or internal
38 influences. A qualitative approach was used that looked into public housing
39 projects in two very distinct European cultures and contexts, Sweden and
40 Cyprus. Through the cases, it was shown that spatial planning documents such
41 as zoning or detailed plans consist not only one of the first interactions the
42 designers have to go through, but also one that is commonly considered as the
43 most important for the environmental impact of their design. However, a
44 significant variation was found on their views on the role of those external
45 influences. Despite the differences in the level of detail and restriction on the
46 planning systems of the two countries, contradicting views were expressed on
47 their importance on supporting and driving environmental sustainability. It is

1 clear that both a detailed and regulatory planning system is crucial, to secure a
 2 minimum level of sustainability among projects, but at the same time a level of
 3 freedom and flexibility to allow for innovation and sustainability exemplars
 4 from individuals that choose to do so. Moreover, even out of the scope of this
 5 study, planning policy is the sole tool to shape the proper distribution of the use
 6 of a region and consequently increase social sustainability.

7 Responding on their previous experience with Life Cycle Assessment, a
 8 couple of participants commented:

9
 10 “There they have made a detailed plan where they set requirements on the
 11 competitors to take... life cycle assessment into account...There were a lot of
 12 other parameters too... It was sustainability. Social, economic and ecological.
 13 And there were all of equal significance (SE 02, Architect Consultant)

14
 15 “LCA should be a requirement in the detailed plan, and introduced as early as
 16 possible in the process. You have to think from the beginning and if the architect
 17 office does not mention it to the developer, or there are no requirements from the
 18 municipality, it may be that the developer does not think about it (SE 02,
 19 Architect Consultant)

20
 21 That is to say that planning policy can serve as a channel for the
 22 introduction LCA. Even though *decision support tools such as LCA are*
 23 *starting to be implemented, this might not be the case in residential and in*
 24 *particular public housing projects with a limited budget, unless it is a*
 25 *mandatory requirement. LCA could be introduced as a requirement in the*
 26 *detailed plan or policy statement and submitted with the design documents for*
 27 *the purposes of planning and building permit. At the same time, it could also be*
 28 *used by the planning authorities while shaping planning policy to allow for*
 29 *informed sustainability policy decisions.*

30 31 32 **References**

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